PROCEEDINGS of the 1ST INTERNATIONAL CONFERENCE on DANCE and DIGITALIZATION

Hungarian Dance University, 2025

PROCEEDINGS OF THE 1ST INTERNATIONAL CONFERENCE ON DANCE AND DIGITALIZATION

Scientific Program Committee

Chair
Dr. habil. Anita Lanszki PhD

Vice-Chairs
Prof. János Fügedi PhD †
Prof. Katalin Lőrinc DLA

Scientific Secretary
Bea Ledniczky

Members
Prof. Gábor Bolvári-Takács PhD
Prof. Márta Fodorné Molnár PhD
Prof. Ilona Konkolyné Kovács PhD
Prof. Szilárd Macher DLA
Dr. Adrienn Papp-Danka PhD
Dr. Judit Radák PhD
Dr. Dorina Eszter Szente PhD
Dr. Ágota Tongori PhD

Organizing Committee

Chair
Dr. Ágota Tongori PhD

Members
Dr. Réka Asztalos PhD
Katalin Kempf
Prof. Ilona Konkolyné Kovács PhD
Dr. habil. Anita Lanszki PhD
Bea Ledniczky
Prof. Katalin Lőrinc DLA
Dr. Judit Radák PhD
Dr. Dorina Eszter Szente PhD

Edited by
Ágota Tongori

Native language proofreader
Jamil Toptsi

ISBN 978-615-5852-39-8

Published by the *Hungarian Dance University*
www.mte.eu 1145 Budapest, Columbus u. 87-89. Tel. 273-3430

Responsible editor
Márta Fodorné Molnár, rector

Photographs
(Front cover & inside; p. 87; pp. 158-159) © *Pál Csillag*

Layout
Krisztián Kánvási

The conference was organized by the Department of Art Theory and the Department of Pedagogy and Psychology of the Hungarian Dance University, together with Vályi Rózsi Library, Archives and Research Centre of Dance Science

PROCEEDINGS OF THE 1ST INTERNATIONAL CONFERENCE ON DANCE AND DIGITALIZATION

November 29, 2024

Hungarian Dance University
Budapest, 2025

PREFACE

The inaugural biannual International Conference on Dance and Digitalization was organized and hosted by the Hungarian Dance University on 29 November 2024.

The in-person conference aimed to comprehensively explore the relationship between dance and digitalization, with themes including the creation of digital databases related to dance, archiving dance, and the scientific use of these resources. Moreover, it examined intersections between dance and social media, the physical and digital worlds, choreography, emerging technologies and art forms, digital platforms and dance education, as well as the role of AI in dance. These themes attracted a diverse international group of participants, including researchers, archivists, dance artists, and choreographers.

The one-day event featured 16 presentations on four main topics organized into five sessions, two workshops, and an evening dance performance. The sessions were structured around the following thematic groups: the archiving and notation of dance, the relationship between dance and social media, the relationship between dance pedagogy and digitalization, the relationship between dance and technology, and key issues in dance research.

This volume presents a selection of eight articles based on conference presentations and workshops, addressing topics such as archiving, opportunities in dance pedagogy and digitalization, dance and social media, and dance choreography incorporating technology. The articles based on the session presentations appear in alphabetical order by the names of first authors, followed by an introduction to a workshop topic and the description of the performance, representing an experimental fusion of dance and technology.

We hope that this volume provides a variety of valuable insights for researchers, educators, choreographers, dancers, and dance students, as well as archivists in the field of dance and digitalization.

the Editor

CONTENTS

PROGRAM

08.30-09.00	**Registration** **Building B / 1st Floor** **Jr. Zoltán Nagy Theatre Auditorium foyer**	
09.00-09.10	**Welcome Greeting** **Building B / 1st Floor** **Jr. Zoltán Nagy Theatre Auditorium**	
09.10-09.55	**Plenary Session - Keynote Speech** ***Both, Miklós:*** *Developing Folk Music Education with Digital Innovation: Bridging Field Research and Academic Perspectives* General Director of Hungarian Heritage House **Building B / 1st Floor** **Jr. Zoltán Nagy Theatre Auditorium**	
	Building D **Ground Floor / Room 2**	**Building D** **Ground Floor / Room 3**
10.00-11.30	**Session 1** **Archiving Dance & Dance Notation** ***Session Chairs: Fügedi, János & Horváth-May, Dániel*** ***Drewes, Henner:*** *Structural Analysis and Animation of Dance and Movement* ***Fügedi, János:*** *Symbol Retrieval Functions for a Computer-aided Kinetography Editor* ***Csillag, Pál:*** *The Power of Metadata* ***Redő, Júlia:*** *The Digitalized Folk Dance Treasure in the Folklore Database of the Hungarian Heritage House – Opportunities of Usage in Education in the Social Media and in Research*	Immersive VR Headset Experience & Information Session about the activities of Hungarian Heritage House ***Busai, Norbert; Módos, Máté & Lauber, Laura***
11.30-12.00	Break*	

12.00-13.30	**Session 2** **Dance & Social Media** ***Session Chair: Darai, Tamás*** ***Madar, Milán:*** *Digital Insights: Key Online Factors Influencing Dancers in Choosing Company/School* ***Artpradid, Vipavinee & Blades, Hetty****: 'What are you willing to give away?' A Qualitative Exploration of the Ontology and Ownership of Internet Dance with Three Hip Hop Dance Artists* ***Berg, Marisa Joana:*** *Knowledge Production in Virtual Communities on Instagram*	**Session 3** **Dance Pedagogy** ***Session Chair: Kovács, Henrik*** ***Lévai, Péter; Oláh, Nóra & Dudás, Dávid:*** *Digital Recording of Hand and Foot Technical Exercises and Creation of a Publication in the BA Folk Dance Course* ***Zsigovics, Istvan:*** *Utilizing Digital Anatomy Applications in Ballroom Dance Instruction* ***Tölli, Szofia:*** *The Changing Role of Mentoring in South-East Asian Classical Dance Forms*
13.30-14.00	Break*	
14.00-15.30	**Session 4** **Archiving Dance (2)** ***Session Chair: Sándor, Ildikó*** ***Horváth-May, Dániel:*** *From Storage to the Knowledge Base – Film digitization at the Institute for Musicology* ***Maczelka, Árpád & Molnár, Péter:*** *The Digitization of the Folklore Archive of the Hagyományok Háza* ***Szabó, Bálint:*** *The Paradox of Conservation: Digitalization, Dance, and What Gets Left Out*	Immersive VR Headset Experience & Information Session about the activities of Hungarian Heritage House ***Busai, Norbert; Módos, Máté & Lauber, Laura***
15.30-16.00	Break*	

16.00-17.30	Networking	**Session 5** **Dance & Technology / Dance Research** ***Session Chair: Lőrinc, Katalin*** ***Rampre, Lili M. & Wehrens, Valerie:*** *Construction Site – On feedback in digital environments and "TakeMoreCare" as a site for artistic discoursivisation* **Čižmek *Tarbuk, Jasna:*** *Working Amid Dance and Technology* ***Kempe, Marisa:*** *Does the Number of Dancers on Stage influence the Aesthetic Perception in Dance?*
17.30-18.00	Break*	
18.00-19.00	**Workshop 1** ***Session Chair: Gaál, Mariann*** ***Felber, Stephanie:*** *Bridging Bodies: Exploring Digital-Physical Doubling in Performance*	**Workshop 2** ***Session Chair: Csillag, Pál*** ***Kovács, Henrik:*** *Digital Tools in Folk Dance Methodology*
19.00-19.10	**Closing Speech** ***Lanszki, Anita*** Conference Chair	
19.10-20.00	**Dance Performance** ***Papp, Gábor; Kézér, Gabriella; HDU Commercial Dance Senior Students:*** ***Soundpainting with Body*** The performance will be preceded by a short presentation on the digitalization and creation process by Papp, Gábor **Building B / 1st Floor / Jr. Zoltán Nagy Theatre Auditorium**	

* Videos on TV screen, including Dance the Hack, a dance and technology workshop with Central Europe Dance Theatre + Publishers' Exhibition in Building D hallway

OPENING SPEECH

MAGDOLNA SALÁT
vice rector
Hungarian Dance University

Ladies and Gentlemen, Dear Honored Guests,

On behalf of the management of the Hungarian Dance University, it is my great honor to welcome all participants to the first International Conference on Dance and Digitalization.

This year, our institution is embarking on its 75th academic year. Building on the rich traditions of the Hungarian State Ballet Institute, our community is dedicated to creating a 21st-century university in which academic research related to dance and educational programs in interdisciplinary areas enhance and broaden the opportunities for artistic education in higher arts education.

Our mission as a university is to make the positive physical and mental health effects of dance visible and accessible not only to artists but also to a broader audience—reaching even those who may not have a direct interest in professional dance.

This mission is greatly supported by academic research and professional conferences, such as the one we are holding today, which explore the connections between dance and social processes. That is why we are so proud of the program and organizers of this first-ever International Conference on Dance and Digitalization.

Let me take this opportunity to express my gratitude to the program committee and its chairs, Dr. habil. Anita Lanszki and Professor Dr. János Fügedi, whose professional guidance helped bring this conference to life — from the idea to its realization. I would also like to thank the organizing committee members and its chair, my colleague, Dr. Ágota Tongori, for their dedicated and tireless work to ensure the success of this conference. Thank you all for your thorough and creative efforts!

I am also pleased to draw your attention to tonight's performance. Commercial dance education is our newest program at the university, but it has already gained immense popularity. The program offers a diverse range of training content, allowing students to acquire qualifications that can be applied in various areas of the dance profession. It is always a great pleasure to recommend the work of our students to our esteemed guests.

Thank you for choosing to join the professional conference of the Hungarian Dance University on this November day, and I wish all participants a productive and inspiring experience!

SESSION PRESENTATIONS

JASNA ČIŽMEK TARBUK
choreographer, spec. oec. project manager, contemporary dance
teacher–counsellor Art School Franje Lučića, Velika Gorica, Croatia

WORKING AMID DANCE AND TECHNOLOGY

Keywords: contemporary dance, digital technology, computer vision and panoramic mapping, live coding, motion capturing,

Abstract

The Art Organization *Fronesis* is a dance company founded by choreographer Jasna Čižmek Tarbuk. After the success of the choreography *The Doors of Perception*, which premiered at the *30th Week of Contemporary Dance in 2012* in Zagreb, *Fronesis* established itself as an artistic organization specialising in the integration of new audiovisual and digital technologies with dance. Jasna Čižmek Tarbuk created three notable performances in collaboration with the Centre for Computer Vision of the Faculty of Electrical Engineering and Computing and Dr. sc. Sven Lončarić: *The Doors of Perception* (2012), *Moved Space* (2014), and *Fragments* (2015). Her research of digital forms continued with the use of live-coded music in *Hologram Space* (2019) and audience interaction via a digital voting application in *The Dance Democracy*. Employing video recording technology, the performance *Insider story* (2021) presented dance from the dancer's perspective by using web cameras and live streaming via YoloBox. The two most recent works include *The Virtual Duet*, an experimental video based on motion capture technology and *What if...* (2023), a performance that makes use of motion capture technology in real time. Both works make it possible for real and virtual dancers to perform together on stage. In this article, I would like to present our 12 years of experience in the use of technology in dance and discuss possibilities for further development.

1. Introduction

The 21st century has undoubtedly been marked as the digital era, a shift that has influenced every aspect of human activity, including dance. One of the first experiments that used computers in connection with choreography and dance was conducted at the

University of Pittsburgh in the 1960s, although the results of those experiments were never published. It is widely acknowledged that the eternal explorer and innovator Merce Cunningham was the first to incorporate digital technology into dance. In 1999, he collaborated with artists Shelley Eshkar and Paul Kaiser to create the décor for *BIPED*, utilizing early motion capture technology.

Motion capture records human movement in a digital format and is commonly used in animation to produce realistic motions for animated characters by replicating the movement of real dancers. As explained by Bodenseiner (2019) in her online article,

> Motion Capture records human movement in a digital format and is often used in animation to make the motions of cartoon characters more realistic. With sensors on their bodies, the Cunningham dancers performed phrases from *BIPED* (The Kennedy Center, 2019) recorded using Motion Capture. Eshkar and Kaiser then animated virtual figures—embodied in chalk-like sketches of human bodies—using the recorded movement phrases. The Motion Capture technology allowed the digital figures to perform the same dance phrases as the actual company members.

Later, during the 1970s and 1980s, numerous experiments were carried out in connection with movement-induced music. From that period onward, more and more dance companies began using digital technologies in their performances, ranging from digital music to 3D mapping and stage design. An example of a company that has built its identity around the use of technology is *Ballet Pixelle*, founded in 2006 by Inarra Saarinen. On their web page (Saarinen, n.d.), they explain their philosophy:

> Unlike other ballet companies, Ballet Pixelle uses new technology to take the art form into a unique environment to new and existing spectators. The ballet uses a new breed of dancers, and a new classical ballet vocabulary created to take advantage of the innovative medium. By performing in an Internet virtual space, it breaks geographical boundaries and time zones, and it allows new spectators, such as disabled individuals, to enjoy a ballet performance that they may not have experienced otherwise. These avatars are real people from around the globe, and they come together to captivate audiences (Saarinen, n.d.).

In 2010, Scott DeLahunta, dance researcher at Coventry University, held a workshop for the Croatian Institute for Movement and Dance ("HIPP") where

he introduced participants to the use of technology in theatre. DeLahunta is an author, researcher, and organizer of several international projects that bring the performing arts (particularly choreography) into conjunction with other disciplines and practices. He also served as Program Coordinator for *Synchronous Objects* and *Motion Bank for The Forsythe Company*.

> The analysis of the recording of Forsythe's choreography *One Flat Thing* was a process of deconstruction that led to some new information. For example, some dancers were interviewed about their roles in the video on multiple occasions to explain the work process to programmers and designers. Based on these interviews the programmers could program movement tracking (Palazzi et al., 2009).

He also visited Zagreb on several other occasions, offering new insights into the use of technology in dance. In 2015, the *Adrien Mondot/Claire Bardaine Company* visited Zagreb for the Dance Week Festival, performing their choreography *Hakanaï*, which used 3D mapping to create a three-dimensional space responding to the dancer's movements.

We employed the same technology in *The Doors of Perception*, performed at the same festival in 2013 so that the success of that performance assured us that our work was aligned with the latest trends in art and technology.

> *Hakanaï*, we read in the program booklet, in Japanese means "something that is temporary and fragile, transient and impermanent, and in this case something between dream and reality." And indeed, it is a matter of a constant duration of stage magic, orientally calm and spiritualized in a poetic solo for a dancer (Akiko Kajihara) and an airy cube. The magic is of course the fruit of digital interpretation (author Rodolphe Martin, while the author of sound interpretation is Christophe Sartor), an ornamental animation that breathes like a living, abstract organism on the surfaces of a cube and interacts with every dancer to every slightest movement of the body (Đurinović, 2015).

My entry into the world of technology was quite accidental. While choreographing a piece set to the music of contemporary composer Vjekoslav Nježić, who had just returned from studying electronic music in the Netherlands, he invited me to collaborate with students at the Faculty of Computer

Science and Electrical Engineering. Having studied physics up until my final examination, I discovered that the head of the Computer Vision Center at the faculty was a former schoolmate of mine. This connection resulted in many years of collaboration and the premieres of three performances. These works established *Fronesis* as a company engaged in the integration of digital technologies in dance. We continued to pursue this direction, albeit with greater modesty lacking the ongoing technical support of the faculty.

2. Theoretical framework

As Francksen (2018, p. 2) claims, the term *digital performance* is largely understood to describe works in which technology constitutes a key element within the performance. As Steve Dixon further elaborates, "We define the term 'digital performance' broadly to include all performance works where computer technologies play a key role rather than a subsidiary one in content, techniques, aesthetics, or delivery forms." Digital dance performance, therefore, falls within this category. Extensive research and experimentation have taken place in these areas, demonstrating that the incorporation of technology offers rich grounds for the creation of new performance models, an insight we have experienced ourselves (Dixon & Smith, 2007, p. 3).

The art organization *Fronesis* was established in 2008 as a small dance company with an intention to bring together young dancers who recently completed their formal education. The aim was to produce performances for children as well as experimental works through which they could learn about dance production while at the same time gaining an opportunity to dance in professional performances. Additionally, the company served as a space where they could prepare for their auditions for further education abroad. Many active dancers within the Croatian contemporary dance scene worked with the company. In 2012, the company was granted a residency at the Zagreb Dance Centre along with an opportunity to collaborate on a project with graduate students from The Faculty of Engineering and Computing. The result of that collaboration was the performance *The Doors of Perception* (*Figure 1*), which premiered at the 30th Dance Week Festival in Zagreb and received a highly positive review:

> A pleasant surprise of the Croatian Choreographic Platform was prepared by choreographer Jasna Čižmek Tarbuk and her group *Fronesis* formed in 2008. A choreographer who has been present in the dance profession for many years as an excellent pedagogue, and choreographer

> for music and children's theater, realized this project in cooperation with students and their professor Dr. Sven Lončarić, composer Vjekoslav Nježić and director Lovro Krsnik. The dance team consists of Katarina Rilović, Marta Habulin and Sven Bahat (*Figure 6*). *The Doors of Perception*, created in an ambitious constellation of interdisciplinary and intersectoral collaboration, combines new-media art, sound, choreography and live performance. If the first and basic question in the introduction of the virtual in dance performance is the relationship between technology and the body, the coherence of all segments is offered in this performance, ie. the creation creates a common correlation between visual-sound-kinetic-body and space. The stage development is developed from the correlation with technology, which means that through choreography movement manipulates the image with sensors, and the image at the same time shapes the movement. By bringing together young dancers and scientists under the mentorship of top experts, this project offers larger potential than just creative research (Sibila, 2013).

Dr. Sven Lončarić was the author of the conceptual framework and the interactive visual installations incorporating elements of augmented reality. He also co-authored all the visualisation programs that they developed and used in the performance. The PhD student and mag. ing. Pavle Prentašić implemented the panoramic visualisation system. In *The Doors of Perception*, we used a range of advanced computer technologies, methods, and applications, such as:

a) Visualisation using multiple projectors and computers to create panoramic movement on all theatre walls (*Figure 1*)
b) Music generation based on the spatial positioning of the dancer detected via computer vision systems (*Figure 2*)
c) Augmented reality systems which detected the position of the dancer on the podium and added virtual elements to the real scene (*Figure 3*)
d) The generation of virtual dancers using recordings of real dancers or through the stroboscopic tracing of dancers (*Figure 4*)
e) Detection of a dancer movements via *Kinect* and the conversion of movement into sound (allowing the dancers to generate sound using their movements, a reversal of the traditional relationship in which dancers follow the music (*Figure 5*)

Figure 1
3D system for panoramic visualization *The Doors of Perception*
[Photograph] by Mladen Božićković

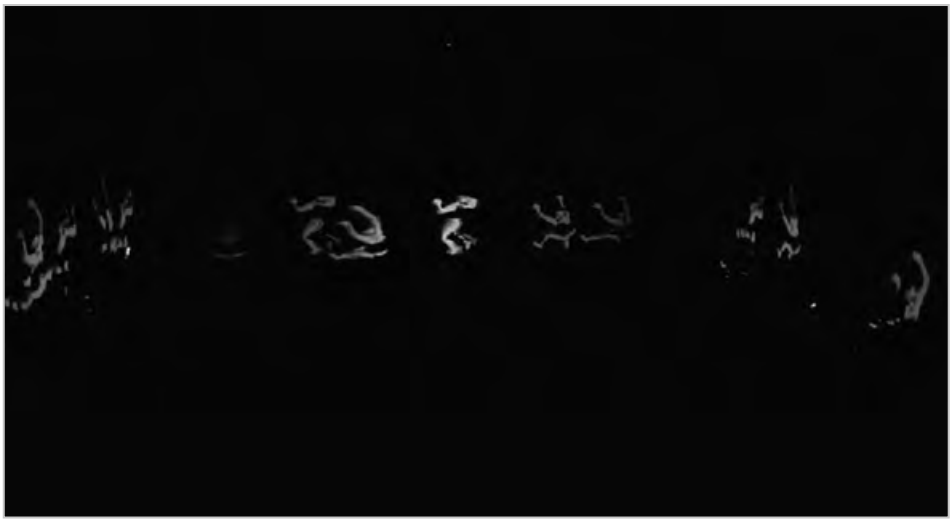


Figure 2
Program for generating music based on the spatial position of a dancer
in *The Doors of Perception*. [Photograph] by Mladen Božićković

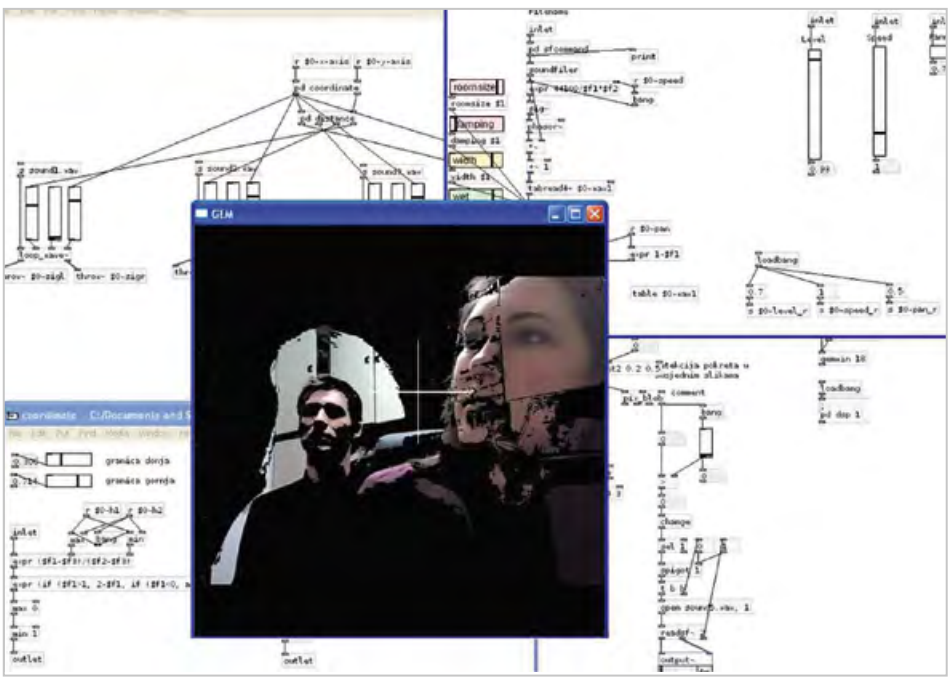


Figure 3
Multiple dancers detected in real time by computer vision in *The Doors of Perception*
[Photograph] by Mladen Božićković

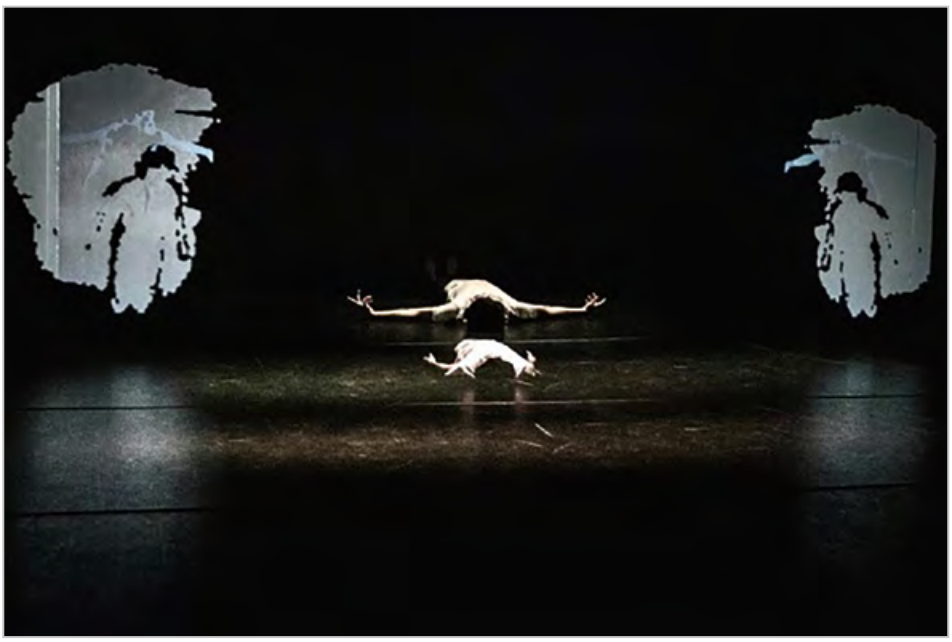


Figure 4
Tracking a dancer in *The Doors of Perception*
[Photograph] by Mladen Božićković

Figure 5
Generating sound with movements *The Doors of Perception*
[Photograph] by Mladen Božićković

Figure 6
The participating students won the Rector's Award for *The Doors of Perception*
[Photograph] by Mladen Božićković

Through all these experiments, we arrived at a conclusion that has been aptly articulated by Johannes Birringer (2003), who states that addressing 'interaction' as a

> spatial and architectural concept for performance, therefore, means shifting the emphasis away from the creation of steps, phrases, 'combinations' or points on the body that initiate movement, away from the dancer's internal bodily awareness … unto (their) environment, to a not-given space but a constructed, shifting relational architecture that influences (them) and that they shape or that in turn shapes them (Birringer, 2003, 90).

The video of the whole performance can be found at: *The Doors of Perception* https://youtu.be/TFpefRvaVDo (Jasna Cizmek-Tarbuk, 2018).

The next project, *Moved Space* (2014; *Figures 7-11*), was also developed in collaboration with dr. Sven Lončarić and the Faculty of Electrotechnics and Computing.

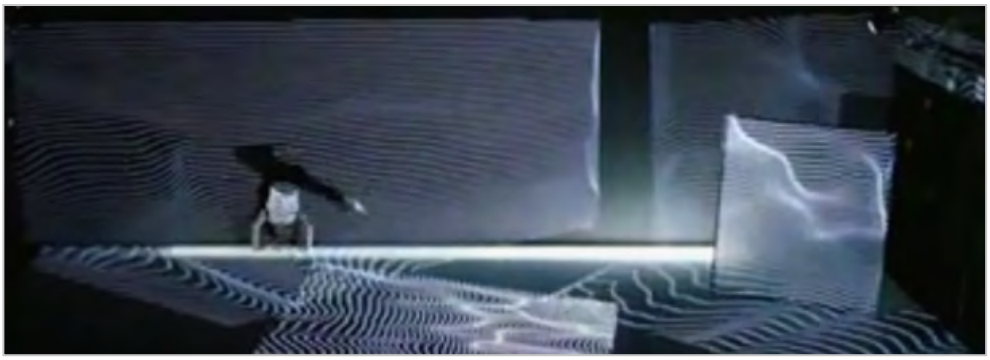
> Continuing the collaboration with prof. dr. sc. Sven Lončarić and his students at the Faculty of Electronics and Computing and director Lovro Krsnik, choreographer Jasna Čižmek Tarbuk premiered the multimedia play Moved Space at the Zagreb Dance Center on October 30. At the heart of the author's research this time are "energies that fill the space after the person is no longer in the same place- referring on the heat of the body that stays on the floor or space even during the time after that space is abandoned." … In the choreographic sense, Moved Space is a more ambitious intervention than last work. As these are mostly very young dancers, the choreographer pays a lot of attention to their presentation. Thus, the choreographic material grows out of the physical and interpretive possibilities of each individual and emphasizes them to the maximum. Through a strategy of sequences of frequent repetitions of motifs, Jasna Čižmek Tarbuk obtains clear and striking stage images, almost characters that are firmly inscribed in the space. Virtual spaces and the usage of a technologically modified image into a dance performance is a common but very risky situation. Jasna Čižmek Tarbuk and her multidisciplinary team deal with this relationship in a direct way, focusing on the level of visibility of corporeality in time and space. Fronesis thus profiles itself as a scientific and artistic project that, by joining young forces on both sides, develops new and exciting areas within this very lively, current and open field (Sibila, 2014).

In this performance (*Figures 10* and *11*), we explored the energy of the body, (i.e. body heat) as a focus of our investigation. This led us to question what is visible and what remains invisible yet present. For this purpose, we used a thermal camera, while also experimenting with different visual programs for time-delayed video (*Figure 7*) and different movable spatial installations (*Figures 8* and *9*).

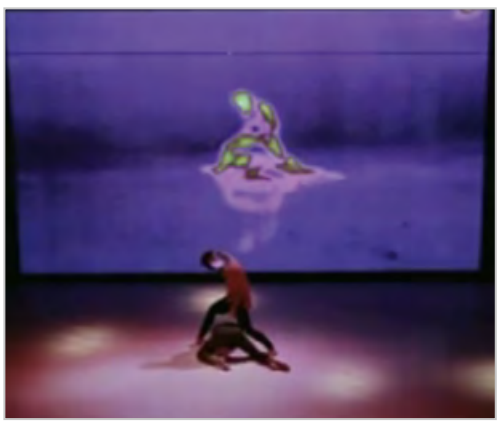
Figure 7
Recording movement with delay *Moved spaces*
[Photograph] by Krunoslav Marinac

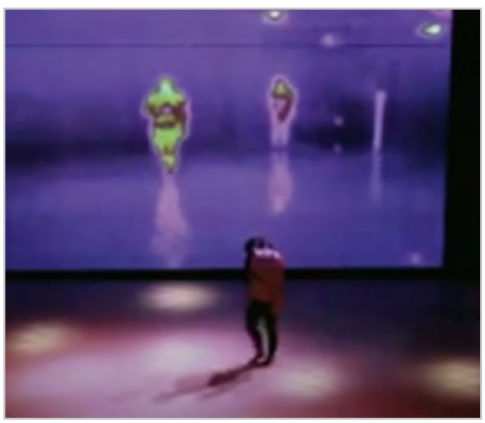
Figure 8
Floating object in *Moved spaces*
[Photograph] by Krunoslav Marinac

Figure 9
Visual installation with multiple projectors and computers in *Moved Spaces*
[Photograph] by Krunoslav Marinac



Figures 10 and 11
Visible and invisible presence; using a thermal camera in *Moved Spaces*
[Photograph] by Krunoslav Marinac





The video of the whole performance *Moved Spaces* can be viewed at https://youtu.be/JwfndT3NKjc?si=Kspk_1_eSfhfPR6P (Jasna Cizmek-Tarbuk, 2014)

Having worked on this piece, we find ourselves in full agreement with Francksen (2018, p. 10) who proposes that a dancer's sense of agency, particularly when responding to their own digital self, suggests the potential for a more synergistic relationship between bodies and technologies can be realised when a dancer focuses their perceptual, embodied, and kinaesthetic sensibilities as part of an active and emerging encounter. This goes beyond merely capturing or preserving the dance, or asking the dancer to respond to or work against digital elements. By integrating

technology into the dancer's perceptual process, and by extension, into the awareness of both performer and audience of any emerging relationship between the movement and the image, the use of video-based technologies can become part and parcel of, what Yehuda E. Kalay (2008) has described as the "believability" of the work (p. 7).

The next performance, *Fragments* (2014; *Figures 12-14* and *25*), was oriented toward the decomposition and reassembly of moving projections of dancers in real time. The music was composed entirely from sounds generated by the decomposition of one drop of water. Visually, pictures of the dancer scattered in all directions and reassembled again. Part of the work incorporated improvisation, during which audience members were invited to participate.

> Filipa Bavčević and Stošija Zrinski are extremely harmonious and refined dancers with delicate figures. Their movement is simple, abstract, careful in impulse and development and obviously affects the image of the scene. One always leads the intervention, while the other reacts, follows, improvises on what has been visually activated. During the performance, the programs and graphics of the scene change (imaginary moving grid, a beam of dots following a part of the body, the image of a little man breaking into parts through sparks, which is explained through the interactive part when the dancers invite individuals from the audience to start the scene. (From the author Jasna Čižmek Tarbuk, I learned that it involves the use of *Kinect* and a camera, which are optical readers that transmit the current image to a computer where it is processed using a specific program, and in real time, the resulting effect is transmitted onto a screen through projectors.) (Đurinović, 2015).

Figures 12, 13 and 14
Various applications used in the performance *Fragments* manipulating projections in real time [Photograph] by Krunoslav Marinac



Video: https://youtu.be/9R0Ia2yCNw4?si=ooTjDl9t8ympgz7- (Jasna Cizmek-Tarbuk, 2015)

In the following two performances, we tried to step away from the purely visual applications of digital technology, which resulted in *Hologram Space* (*Figures 15–18*), in which we manipulated a large plastic sail, an object which is highly mobile and hard to tame. To complement these characteristics, we chose to incorporate live-coded music, composed and performed in real time. This allowed the musician to follow the dancers' movements (*Figures 15, 16, 17,* and *18*). Dr. sc. Gordan Kreković, who composed the music for the piece, remarked that

> I believe that creating music for contemporary dance and working with dancers almost inevitably brings forward the need for an exploratory, agile and collaborative approach. The creative process enables a constant rethinking of the nature of the relationship between dance and music, between the expression of movement and musical aesthetics, between composition and choreography, between dance rhythm and musical rhythm, between dramaturgy and musical movements, between harmony and contrast, and sometimes dance imposes its needs, and sometimes the music does. If music and choreography are created simultaneously, it is an iteration, evolutional process of constant adaptation where – unlike composing for a film which is fixed at a point – collaboration between a composer and a choreographer lasts for a long period of time and converges towards a mutual creation. This is, in my opinion, why composing for contemporary dance is an incentivising, unpredictable and interesting experience. [Editor's note: The quote is attributed to Dr. sc. Goran Kreković by the author. The source is not independently verified.]

Figures 15, 16, 17 and 18
Performance *Hologram Space* with live coding. [Photographs] 15 & 17 by Neven Petrović; [Photograph] 16 by Krunoslav Marinac; [Photograph] 18 by Jasna Čižmek Tarbuk




Part of the performance *Hologram Space* from the rehearsal for the TV show *Art and Digitalisation,* can be viewed at: https://youtu.be/dCKmffGcV3c (Jasna Cizmek-Tarbuk, 2021).

Another approach to using digital technology was implemented in *Dance Democracy* (*Figures 19* and *22*), a humorous play that satirizes politics but can also be understood as a love triangle. In this piece, the audience votes on how the drama will unfold. For this, our IT specialists programmed a custom algorithm that counts the audience's votes (*Figures 20* and *21*), allowing them to actively participate throughout the entire performance.

Figures 19, 20, 21, and 22
A performance shaped by audience preferences - *Dance Democracy*
[Photograph] by Krunoslav Marinac

Video: *Dance Democracy*: https://youtu.be/lxSjvvnKERw (Jasna Cizmek-Tarbuk, 2021a)

The two most recent performances involving digital technology, *Virtual Duet* and *What if...*, were both created in 2024 using motion capture technology (*Figures 23* and *24*) and explored a whole new chapter of possibilities. Unfortunately, despite its potential, I still find it financially inaccessible for small dance companies.

Figures 23 and 24
What if… [Photographs] by Neven Petrović

Video recording of the performance *What if…* https://youtu.be/hJGQBMtmvYk (Jasna Cizmek-Tarbuk, 2023)
Rehearsal for recording of *Virtual duet*: https://youtu.be/lLrN9ZRE6_M

3. Analysis

During the ten years in which we explored all the possibilities offered by modern technology, including visual installations, colour variation in thermal imaging based on dancer's body temperature, image splitting, and movement tracking with *Kinect*, we found that the best methods were those that allowed some artistic intervention and programming by the author. When using technology, there is a recurring gap between what happens in the rehearsal space and what is executed in the laboratory. Typically, the integration of these elements occurs only in the final days before the premiere, which is often when new creative possibilities begin to emerge. Unfortunately, economic calculations, particularly that the persistent underfunding of dance art, frequently interrupts the research that we would like to pursue. Although motion capture technology is intriguing, it can become stale as it simply replicates the movements of the performer. In the future, however, using artificial intelligence

combined with sufficiently large data sets may make it possible to generate a virtual partner. One promising development is the increasingly accessible and efficient quality of technological tools, making it possible to apply new solutions more quickly and easily. Even more importantly, these tools enable archiving, facilitating effective learning from previous experiences and past mistakes.

Figure 25
The performance *Fragments*. [Photograph] by Krunoslav Marinac

4. Discussion

Is technology beneficial or detrimental to dance as an artistic endeavour? In his article *Don't Techno for an answer*, Sanjoy Roy (2003) writes:

Put together the words dance and technology, and you can almost hear the ruckus of side-taking and name-calling as a host of other rowing couplets jostle to weigh in behind them: artistic and scientific, natural and artificial, organic and mechanical, ancient and modern, feminine and masculine, east and west.

Illusion has long been an integral part of theatre, achieved through lighting and scenography, none of which are considered inappropriate. What ultimately matters, is a thoughtful relationship and a tasteful ratio between movement in dance and the amount of technology employed. As the author from the beginning of this chapter concludes (Roy, 2003, 6):

> In sum, I see two main problems with the dance-technology coupling in performance. First, unless used well, it can compete with and displace dance rather than complementing or enhancing it. And as dancers, choreographers or dance-goers, we should value the distinctive communicative effects and effects of the live performing body (where 'live' means far more than just 'real time'). Second, technology used in dance often shifts the emphasis from product to process, giving too much weight to the whats and hows rather than the whys and wherefores of the artwork. And as any stage artist knows, whether choreographer or performer, the moment and import of performance lies ultimately in its effect, its production, rather than in its process or its preparation.

5. Conclusion

Work on performances that incorporate technology has consistently proven to be an interesting and exciting experience. Through collaborative effort, we addressed the challenges that arose and came away from every performance having learned something new. Many IT students involved in these projects admitted that they had never attended a dance performance prior to the collaboration. However, after the joint experience, they became more open to appreciating the abstract aesthetics and poetics of dance as an art form and expressed genuine enjoyment of the performances.

On the other hand, the performances gained visual appeal and clarity as the programmers underlined the themes and messages we aimed to communicate.

Technological advancement is an undeniable reality. While we can choose to embrace it or ignore it, it undoubtably streamlines many aspects of artistic creation that were previously more complicated.

Using technology in a responsible way only stands to improve the position of dance as an art form and contribute to its expression.

References

Bodensteiner, K. (2019, October 3). *Merce Cunningham + BIPED: Meet the artist through one of their most important works* (L. Resnick & T. Bryant, Eds.). The Kennedy Center. https://www.kennedy-center.org/education/resources-for-educators/classroom-resources/media-and-interactives/media/dance/merce-cunningham--biped/

Birringer, J. (2003). Dance and interactivity. *Dance Research Journal*, *35*(2), 89–111.

Dixon, S., & Smith, B. (2007). Digital_Performance. In *pdfcoffee.com*. The MIT Press. https://pdfcoffee.com/digitalperformance-pdf-free.html

Đurinović, M. (2015, June 18). *Yin i Yang*. plesnascena.hr. https://www.plesnascena.hr/index.php?p=article&id=1786

Đurinović, M. (2015, December 4). *Čarobni svjetovi koji mame*. plesnascena.hr. https://www.plesnascena.hr/index.php?p=article&id=1848

Francksen, K. (2018). The Implications of Technology in Dance: A Dancer's Perspective of Moving in Media-Rich Environments. In S. Whatley, R. Cisneros, & A. Sabiescu (Eds.), *Digital Echos* (pp. 57–79). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-73817-8_4

Jasna Cizmek-Tarbuk. (2015, December 20). *Fragmenti - Jasna Čižmek Tarbuk* [Video]. YouTube. https://www.youtube.com/watch?v=9R0Ia2yCNw4

Jasna Cizmek-Tarbuk. (2014, November 10). *Moved spaces HQ* [Video]. YouTube. https://www.youtube.com/watch?v=JwfndT3NKjc

Jasna Cizmek-Tarbuk. (2021a, February 8). *Plesna demokracija izvedba 2020* [Video]. YouTube. https://www.youtube.com/watch?v=lxSjvvnKERw

Jasna Cizmek-Tarbuk. (2023, June 20). *Što ako. . ..? / 27.5. 2023* [Video]. YouTube. https://www.youtube.com/watch?v=hJGQBMtmvYk

Jasna Cizmek-Tarbuk. (2021, February 8). *VID 20200905 WA0000* [Video]. YouTube. https://www.youtube.com/watch?v=dCKmffGcV3c

Jasna Cizmek-Tarbuk. (2018, December 31). *Vrata percepcije |Doors of Perception* [Video]. YouTube. https://www.youtube.com/watch?v=TFpefRvaVDo

Kalay, Yehuda E. 2008. "Introduction. Preserving Cultural Heritage through Digital Media". In New heritage. New media and cultural heritage. Edited by Yehunda E. Kalay, Thomas Kvan and Janice Affleck. 1-11. London: Routledge.

Palazzi, M., Shaw, N. Z., Forsythe, W., Lewis, M., Albright, B., Andereck, M., Bhatawadekar, S., Ban, H., Calhoun, A., Drozd, J., Fry, J., Quintanilha, M., Reed, A., Schroeder, B., Skove, L., Thorndike, A., Twohig, M., Ahlqvist, O., Chan, P., . . . Noe, A. (2009). Synchronous Objects for One Flat Thing, reproduced. In J. Martino (Ed.), *SIGGRAPH '09: ACM SIGGRAPH 2009 Art Gallery*. Association for Computing Machinery. https://doi.org/10.1145/1667265.1667306

Saarinen, I. (n.d.). *Ballet Pixelle - Experience the Ballet in virtuosity!* Retrieved February 14, 2025, from http://www.balletpixelle.org/

Sibila, I. N. (2013, June 8). *Multiplicirani obrisi plesača (Multiplied Outlines of Dancers)*. plesnascena.hr. https://www.plesnascena.hr/index.php?p=article&id=1583

Sibila, I. N. (2014, November 13). *Igra topline i energije (A Play of Heat and Energy)*. plesnascena.hr. https://www.plesnascena.hr/index.php?p=article&id=1696

Roy, S. (2003, July 31). *Don't techno for an answer? Dance and technology*. Sanjoy Roy. https://sanjoyroy.net/2003/07/dont-techno-for-an-answer-dance-and-technology/

The Kennedy Center. (2019, August 9). *"BIPED" Trailer | Merce Cunningham at 100 at the Kennedy Center* [Video]. YouTube. https://www.youtube.com/watch?v=o9BiF_6gt40

The Kennedy Center. (n.d.). *Merce Cunningham + BIPED: Meet the artist through one of their most important works*. https://www.kennedy-center.org/education/resources-for-educators/classroom-resources/media-and-interactives/media/dance/merce-cunningham--biped/

SESSION PRESENTATIONS

PÁL CSILLAG
ballet master, master teacher
Hungarian Dance University

THE POWER OF METADATA: VISUAL TRASURES OF THE LAST 75 YEARS

Keywords: digitization, database, metadata, keywords, facial recognition

Abstract

Archiving dance, movement and choreography has been a challenging task from the beginning. In addition to the well-known dance notation systems and figurative notations, the most frequently used method is the use of photography and video recording. But is there a solution that can assign descriptive data and additional information to these recordings, which contain detailed specifications and can be searched by keywords in any digital system? The answer is yes. The metadata (Csillag, 2024).

In 1952, the Hungarian state established the State Ballet Institute (*Állami Balett Intézet*). The institute was temporarily housed in a designated section of the beautiful Drechsler Palace on Andrássy Street, located opposite the Opera House. Ferenc Nádasi's private ballet school, nationalized by the State, became part of the new school. In the same year, the school adopted the Russian Vaganova training system and began its operations in the magnificent building. The school remained in the Drechsler Palace for 54 years before relocating to a new campus in 2004, leaving behind decades of memories.

Figure 1.1
Drechsler Palace, 25 Andrássy Street, Budapest District VI,
Hungary between 1881-1890 (Klösz, 1900)

Note: From *Drechsler-palota* [Photograph]. Source: Fortepan / Budapest Főváros Levéltára / Klösz György fényképei / photo by György Klösz, Levéltári jelzet: HU.BFL.XV.19.d.1.06.053 Year 1900. Picture number 82314 https://fortepan.hu/hu/photos/?id=8231

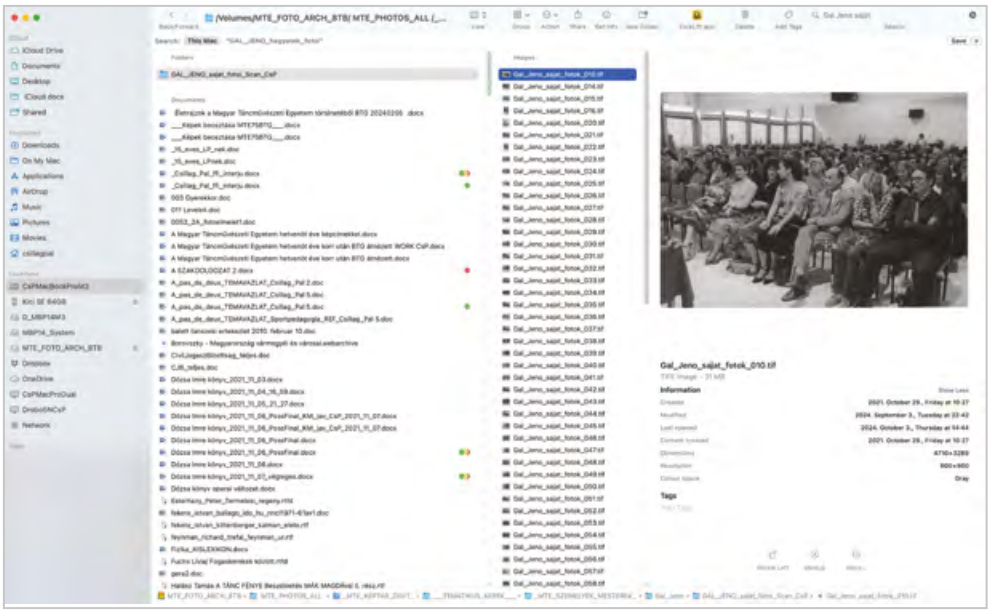
Figure 1.2
Drechsler Palace in 2023 (Bujnovszky, 2023)

Note: [Photograph] by Tamás Bujnovszky, Bánáti & Hartvig Architect, 2023.07.11. https://bh.hu/munkak/w_budapest/

In 1996, I visited the school for administrative purposes. While there, I saw two men stacking 5-by-8-inch black-and-white photo paper boxes under the stairs. I looked inside some of the boxes and was amazed by the old black-and-white photographs — fragments of our history. When I asked them about the reason for their relocation, they informed me that the boxes were destined for disposal. I immediately went to the secretary's office and spoke about the situation with Dr. Gábor Bolvári-Takács, who was unaware of the planned disposal and equally surprised. We agreed to find a safe, dry, and dark place to store these valuable photographs, and I decided to save and catalog them. This took place 28 years ago, and over the years I have mentioned it repeatedly on various platforms, seeking assistance. Eventually, in 2018, funding became available from a grant, which allowed us to purchase a flatbed scanner. Since then, we have digitized a significant portion of these silver bromide prints. By October of this year, our collection had grown to a total of 607,625 photographs, including newly created digital images. The beginning of the digitization was a major milestone, but we soon realized that without identifying the individuals in the photographs, they remained little more than memories of the past and nostalgic pictures. Before the Covid-19 lockdown, I asked several colleagues if they would be interested in identifying the people in the photographs. Two of them were happy to help and made significant contributions to the work. We created 369 Excel sheets, each containing serial numbers corresponding to the photographs, and began filling them with all of the available information. These files were uploaded to Dropbox and shared with selected contributors to facilitate ongoing documentation. However, manually entering these data into Excel sheets is not the most efficient approach. It is a time-consuming process and does little to integrate the information from the photographs themselves. To locate a particular individual, one must first search for their name in the Excel sheets, copy the corresponding serial number, and then manually retrieve the photograph from a collection of more than 600,000 images.

It was fascinating to identify the individuals in the photographs and gradually supplement the list. In the picture below I was able to recognize at least 30 people. Each identified name had to be manually entered, one by one. Later, all the names were added to the files themselves as metadata. In this picture, the result of a search for one specific name is shown.

Figure 2
Screenshot of a search result for the name "Gal Jeno", MacOS Sequoia 15.3.1 [Screenshot]



Note: From *Meeting in the eighties, unknown details* [Screenshot].
Hungarian Dance University (HDU) Photo Archive

This is where the power and benefits of metadata become evident. Metadata refers to descriptive data associated with digital content. When using a digital camera—regardless of whether the file format is RAW or JPG—the camera automatically embeds various details into the file (*Figure 3*). If a mobile phone is used, additional metadata such as geolocation may also be included.

While metadata is a powerful tool, it does not help to solve our core problem—we still do not know the identities of the individuals in the photographs! As we are working with scanned silver bromide prints, the technical information itself is not relevant, but the names of the individuals are!

Figures 3.1 and 3.2
Zoltán Szolnoki, Gizella Zarnóczai, Tibor Szabó, unidentified, Blanka Faith, Oszkár Rotter [Photograph] (on the left) and embedded camera information [Screenshot] (on the right).

Note: [Photograph] by Pál Csillag 04. 09. 2023. HDU Photo Archive

For our purposes, the IPTC metadata is essential. IPTC (International Press Telecommunications Council) sets the standards for embedding metadata in digital images. IPTC keywords can consist of words or phrases that help search engines categorize and retrieve an image based on its content.

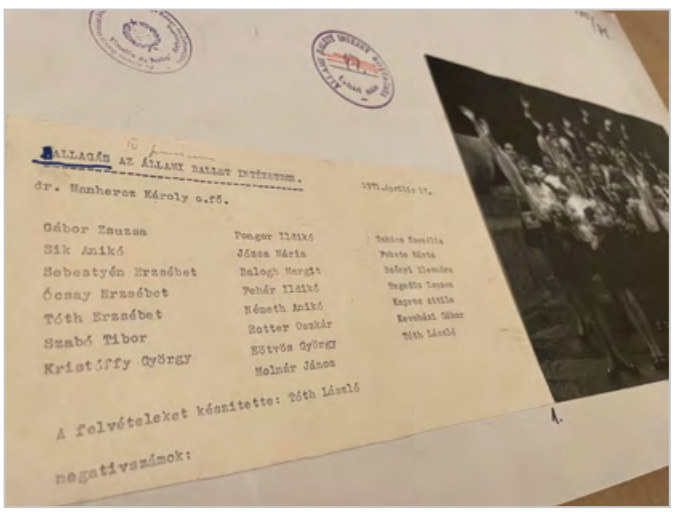
Photo metadata is key to protecting images' copyright and licensing information online. It is also essential for managing digital assets. Detailed and accurate descriptions about images ensure they can be easily and efficiently retrieved via search, by users or machine-readable code. This results in smoother workflow within organizations, more precise tracking of images, and increased licensing opportunities (IPTC - International Press Telecommunications Council, 2024).

The PhotoShelter website article *On-Site SEO: Images and IPTC Metadata* summarizes the importance of keywords as follows: "Without keywords the search engine crawler will not be able to index an image, due to the lack of readable content and describing information (PhotoShelter, n.d., Keywords)."
By simply entering a name into any search engine, the system will list all of the photographs that are associated with that individual. We are now close to achieving our goal!

Figures 4.1 and 4.2
Photos from the HDU photo archive, (n.d.) without keywords (on the left) and with keywords (on the right)

However, only the data that we manually entered will appear in the search results (*Figure 4*). Adding names to each file individually is a time-consuming process, and we must also ensure that the names are recorded in the correct order. This is particularly challenging with group photographs, especially when the individuals are not positioned in a straight line. Moreover, we are dealing with more than 400,000 images. In addition to dance-related photographs, there were also images from other events such as graduations, meetings, and performances. While we have the lists of the names associated with these locations, each name must eventually be matched with the correct face.

Figure 5
Photo of a large sheet of one page of the HDU's photo albums



Note: [Photograph] by Pál Csillag. HDU Photo Archive

This seemed like such an impossible mission that even Tom Cruise would not take it on. Nevertheless, this is how I started, manually entering the names, one by one, into the photos I was working with. Some images also contain pictures on the walls featuring famous figures such as those from 1952 featuring Lenin, Stalin, and Mátyás Rákosi, whose names will also be added.

Figure 6
State Ballet Institute, sometime in the 50s with framed photos of Lenin, Rákosi and Stalin (from left to right) on the wall. HDU Photo Archive

After reaching out to several professional companies that serve modelling agencies and sell stock photos, I almost gave up. Only one company, whose named will remain undisclosed, remained as a potential option, but the representative declined to provide a quote for their product.

Figure 7
A boys' ballet class: József Kádár, Péter Kollár, Gyula Harangozó Jr. and Jenő Lőcsei. HDU Photo Archive

A few months later I approached my search from a different angle and discovered the solution: Adobe Lightroom Classic. It features a facial recognition engine and had been sitting in my dock beside Photoshop and Bridge for years—yet I have never used it.

Before I started experimenting with this feature, I made full backups on two Disk Attached Storage (DAS) devices to avoid losing any data. Working with important data requires special attention, making a reliable backup system an absolute necessity. For this purpose, I used two Drobo 5C units for backups. These DAS devices utilize BeyondRAID technology which, depending on the setup, protects against the failure of one or two hard drives. The system does not require any technical skills, simply plug and play. I deliberately avoided any kind of Network-Attached Storage, leaving that for the experts. The first backup took almost 30 hours. While storing all the backups in the same location is not ideal, it is still preferable to only having one copy. Addressing this issue remains a priority. Progress is ongoing, albeit slowly, with a cloud server currently in development. The continuous updating of files by adding new metadata results in frequent changes to the files. Unfortunately, the synchronizing software cannot differentiate between specific changes in a file. Rather than simply changing the part of the files which contains new information, all of the files have to be replaced during each backup, with the old versions discarded. In the most recent backup, the software detected 6,685 changes, and the process was completed in 14 minutes with an average transfer speed of 55 MB/sec. Even at this speed, maintaining two copies requires time and effort, though it is worth it in order to avoid data loss. Lightroom's facial recognition feature worked surprisingly well. The software successfully detected faces and generated descriptive information for each of them. Running in the background, it continuously searches for unidentified faces. The initial indexing took more than two weeks of continuous operation, but the results were remarkable. Of course, the software requires training, but it learns efficiently. Once a person is identified and labeled, Lightroom searches for similar faces in the background and suggests matches for confirmation. The more samples it processes, the more accurate its recognition becomes.

Figure 8
A Screenshot of Adobe Lightroom Classic

Note: From *Screenshot of Adobe Lightroom Classic*: 426.916 files, [Screenshot] from 29th of October, 2024.

Recognizing that information is power, we intentionally scanned the silver bromide prints uncropped to preserve all available information, particularly names written beneath the individuals, which of course, proved useful in identifying the people in the photographs. To facilitate the identification process, I created small JPEG copies to allow for faster processing. The original scans were produced in 16-bit color depth and saved in a TIFF format. One single TIFF file is 264,3 MB, a substantial size, but these allow for high-quality 70x100 cm prints which can later be reduced in size.

Returning to the content of the photographs, I am fortunate to have been connected to the Hungarian Dance University for 43 years, since the age of 10 (or rather, 42 years, as I spent one year dancing abroad). As a result, I have a kind of built-in facial recognition ability, though it is impossible to recall all of the names. Lightroom Classic will assist in this process, but it first requires manual input to associate names with faces. Fortunately, it proves to be an excellent student and does not forget names like I do. In addition to relying on my own memory, I use various sources to identify the individuals whose names I do not know or remember. The most useful of these are the ID photo sheets used during exams to verify the students' identities. The use of two computers and three monitors significantly streamlines the process of searching for and entering data simultaneously.

Figure 9
Work in progress

Note: [Photograph] by Pál Csillag

Although I am not on Adobe's payroll (however, at this point, I feel I should be), I must acknowledge that Lightroom Classic's facial recognition function has exceeded my expectations. It has significantly simplified the process of searching for photographs of specific individuals. Beyond the technical advantages, working with these images also is deeply rewarding. It is particularly heartwarming to see students growing up over the nine years they spend at the school, watching them grow and ultimately become artists. It is particularly heartwarming to see students growing up over the nine years they spend at the school, watching them grow and ultimately become artists (*Figures 10.1* and *10.2*).

Figure 10.1
Dávid Borka at the age of ten

Note: [Photograph] by Csaba Mészáros. HDU Photo Archive

Figure 10.2
Dávid Borka nine years later

Note: [Photograph] by Pál Csillag. HDU Photo Archive

Another example of how time passes: in this picture (*Figures 11.1* and *11.2*), you see Mária Aradi. There is a 66-year gap between the two photos. Would you recognize the resemblance?

Figures 11.1 and 11.2
Irén Bartos and Mária Aradi in 1953/54 and Mária Aradi in 2021. HDU Photo Archive

Note: [Photograph] by unknown
[Photograph] Pál Csillag

With the use digital cameras, there is no need to digitize the photographs. New pictures can simply be imported into the library and the facial recognition engine will identify and label the known faces while suggesting unidentified ones for manual naming. This means that locating a photo of a specific person is as simple as performing a name-based search, after which the software will list all available photographs of that individual.

The plan for the next five years is to complete the identification of all unknown faces and process all of the recognizable photographs. While the results we have achieved so far have been great, photos continue to surface on campus in the form of contact sheets, prints, and even 6x6 black-and-white negatives (*Figure 14*). I am eager to examine these and hope that one day this mission will be fulfilled.

Figure 12
Photo albums, Forte photo paper boxes and documents
at the Hungarian Dance University on 10.02.2024.

[Photograph] Pál Csillag

In many cases, when I encountered difficulties in identifying particular individuals, I turned to various public photo archives for assistance. One of them is the National Archive (*Nemzeti Archívum*, n.d.) a vast, searchable database containing thousands of photographs. It is an excellent tool for looking up and identifying people. As the establishment of the school in the 1950s was an important event (not only due to its adoption of the Russian model), several well-known and acclaimed photographers visited the school and took fantastic photographs, including Andor Tormai (*Nemzeti*

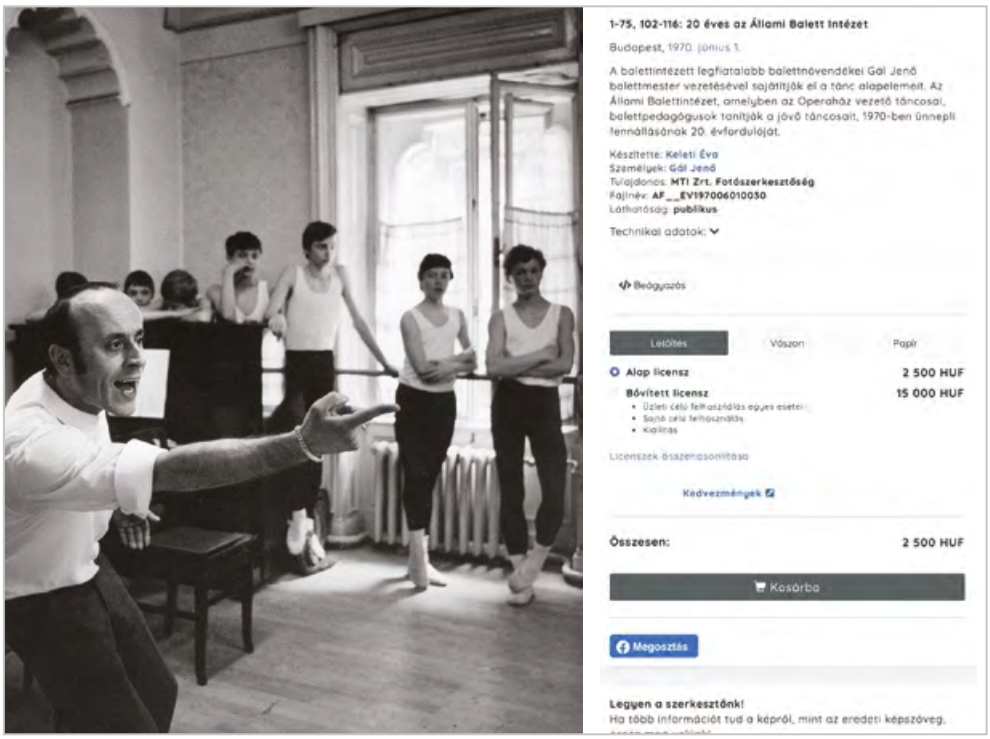
Archívum, n.d.-b, *Figure 15*) and Éva Keleti (*Nemzeti Archívum*, n.d.-c), among others. Moreover, I found several photographs in our archive (specifically silver bromide prints) that are also present in the National Archive. The duplicate images often include additional information, such as the exact date of capture and the names of the individuals depicted. Some of this information is included in the metadata fields of the photos.

Figures 13.1 and 13.2
Madgda Mák demonstraiting a movement, 1957/58 (on the left)
(Tormai, 1958b) and photo metadata (on the right)

Note: From *Education - Ballet – Ballet class in the State Ballet Institute,* Budapest. (1958. May 11) [Photograph] by Andor Tormai. MTI/MTVA.

The metadata on the right (*Figure 13.2*) reads as follows:
Magda Mák giving ballet class to the second-year students at the State Ballet Institute; Magda Mák (Nyitra, 1925. szept. 2.–) Ballerina, ballet master, pedagogue. Born in Nyitra. She graduated from the Opera House's ballet school; her master was Ferenc Nádasi. From 1950 she started teaching at the State Ballet Institute. In 1959 she graduated as a ballet master. Photo: Andor Tormai, person: Magda Mák, Copyright: MTI/MTVA, File name: AF__TI195805110089, Issue date: 2015-03-12 (*Oktatás - Balett - Balettóra Az Állami Balettintézetben*, n.d.)

Figures 14.1 and 14.2
Ballet master Jenő Gál (Keleti, 1970)

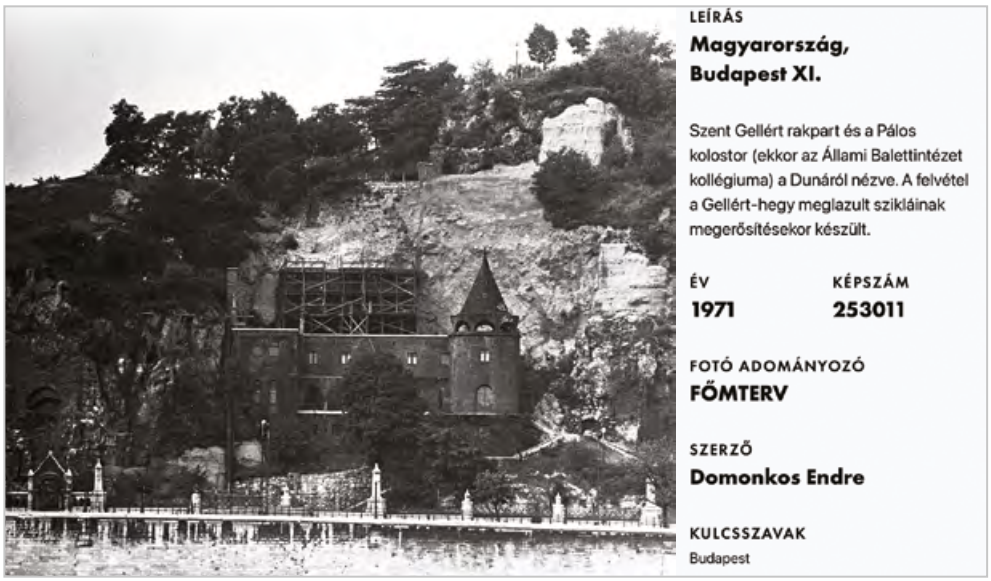


Note: [Photograph] by Éva Keleti (1970). HDU Photo Archive. The metadata (Figure 14.2) [Screenshot] (*20 éves az Állami Balett Intézet*, n.d.)

In another remarkable photo taken by Éva Keleti in 1971 Jenő Gál could be seen instructing the students (*Figure 14.1*). The fourth figure from the right is Mr. György Szakály, a word-renowned soloist, choreographer, actor, ballet director, ballet master, and former Rector of the Hungarian Dance University. Szakály has received numerous awards.

In addition to the National Archive, there is also a copyright-free, community-based photo archive called FORTEPAN (*Fortepan — Home*, n.d.). This archive contains photographs which were either salvaged from the trash or donated as part of bequests. Since all of the images are free to use, I spent several days browsing the entire site, saving all the photographs that were somehow connected to the school. Among these, I found some relevant images, such as the photo of re-construction works near the former dormitory of the State Ballet Institute (*Figure 15*).

Figures 15.1 and 15.2
The dormitory of the Hungarian State Ballet Institute (Domonkos, 1971)



Note: [Photograph] From *Magyarország, Budapest XI.* Szent Gellért rakpart és a Pálos Kolostor (Dormitory of the State Ballet Institute at that time) [Photograph] by Endre Domonkos (1971). Fortepan. https://fortepan.hu/hu/photos/?id=253011

Figure 16
Picture taken from the inside of the dormitory in the academic year 1952-1953

Note: [Photograph] HDU Photo Archive. Number: 000229_1952_53.

Another photograph (*Figure 16*) captures a different perspective, taken from the inside of the dormitory. The image shows the destroyed Elizabeth Bridge in the top left corner, in the aftermath of World War II.

Figure 17
Ferenc Nádasi giving a class to students from the first graduating cohort: Erzsébet Ángyási, Erzsébet Boros, Jacqueline Menyhárt, Margit Miklóssy, Adél Orosz, Vera Szumrák, and Annamária Wellisch (names are not in order).

Note: [Photograph] HDU Photo Archive.

In this picture (*Figure 17*) (of which we also have a copy in our archive, scanned from a silver bromide print but lacking additional information) we discovered detailed information including the photographer, the date, and more: "Description: Hungary, Budapest Vl. Andrassy (Stalin) Street 24. State Ballet Institute, former place of Opera Café, Ferenc Nádasi dancer, ballet master, IX., graduating class…, 1953, donated by Antal Kotnyek"

Another photograph (*Figure 18*) from 1933 includes the following keywords: Mihály Székely, Ilona Vera, Karola Szalay, József Somló, Andrássy Street at Jókai Square, with buildings of Oktogon Square visible in the background. The images depict members of the Opera House collecting donations for the Territorial Children's Found. In the middle stands opera singer Mihály Székely. To his left is dancer Ilona Vera (wearing a quadrillé coat), and beside her is ballet dancer Karola Szalay. On the far right is opera singer József Somló Location: Budapest, 1933.

Figure 18
Members of the Opera House collecting donations for the Territorial Children's Found (*Magyarország, Budapest VI. - Az Operaház társulatának tagjai adományokat gyűjtenek az Országos Gyermekvédő Liga számára*, 1932)

Note: Magyarország, Budapest VI. Fortepan. https://fortepan.hu/hu/photos/?id=40943

These previously unknown pieces of supplementary information proved significant. By adding this picture to our archive and identifying the individuals, we may be able to identify other photographs of them.

Figures 19.1 and 19.2
Ilona Kiss, ballet mistress, among her first-year students (Marosi, 1959)

Note: From *Culture - Art – The 10-year-old State Ballet Institute, Budapest* [Photograph] by László Marosi (1959. november 20). People shown: Ilona Kiss, Copyright owner: MTI/MTVA, File name: AF__MZ195911200018, status: public, Issue date: 2014-11-04, Technical details: Bit depth: 8, orientation: horizontal, Width (px): 4119, Hight (px): 3309, Type of source: JPG, Identifier: c394312e-fbf8-4b72-bdb4-e4bca97ff871

People shown: Ilona Kiss, Copyright owner: MTI/MTVA, File name: AF__MZ 195911200018, status: public, Issue date: 2014-11-04, Technical details: Bit depth: 8, orientation: horizontal, Width (px): 4119, Hight (px): 3309, Type of source: JPG, Identifier: c394312e-fbf8-4b72-bdb4-e4bca97ff871. Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-WE9FSVdN NGdaWVpFRVI2azRMRWdoSzZvR3VWay91bkJMWWFiZUc1RXpsaGpF YURYc1VHOGt0c0hnS2ljMXhxQg

There is a book set to be published for the 75th anniversary of the school, but I was unable to find any photographs of ballet mistress Ilona Kiss for our archives. However, I discovered one in the National Archive with the following description: *Ballet mistress Ilona Kiss with her first-year students in the 10-year-old State Ballet Institute*. Additional metadata provides further details: "*Ilona Kiss, 1959. 11. 20., photo: László Marosi*" Furthermore, this record confirms that Andrássy Street was first renamed to Stalin Street before later receiving its third name, People's Republic Street (Népköztársaság útja)

Figures 20.1 and 20.2
Ballet mistress Irén Bartos, with third-graders Olga Boné, Mária Varsányi, Mária Bérczes and Ferenc Behumi

Our archive contains a particular photograph of Irén Bartos (*Figure 20.1*) for which the only known information was the names of the students. However, I discovered a similar copy in the National Archive, which, based on the circumstances, must have been taken on same occasion. This allowed us to retrieve important information about the picture taken by Andor Tormai on the 11th of June 1958 (Tormai, 1958a).

Figure 21
Olga Boné, Mária Varsányi, Mária Bérczes, Irén Bartos, Ferenc Behumi

Note: From *Irén Bartos correcting the movement of a third-year student*. State Ballet Institute, Budapest, (11.05. 1958). HDU Photo Archive.

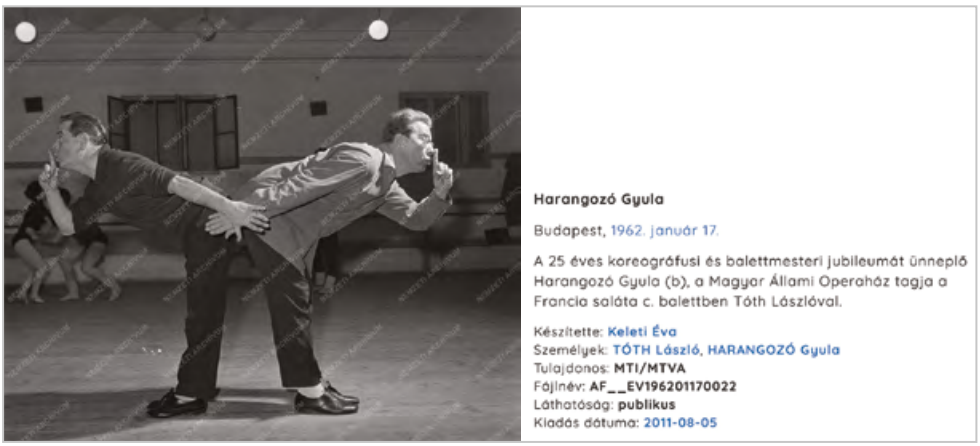
Figure 22
Group photo of the teachers and the leadership of the school in the '60s.

Note: HDU Photo Archive

Some of the people in the image have yet to be identified.

One individual who must be mentioned—for multiple reasons—is László Tóth. He was a student at the Opera House between September 1, 1938 and August 31, 1939, and many years later became a member. In addition to dancing, he started to develop an interest in photography. As an enthusiastic photographer, there were times when he was exempted from ballet classes and performances to make copies of sheet music, as that time photocopiers were not yet in use. Instead, he took photos of each page and made enlargements on "Forte Dokubrom" photographic paper. After he retired from dancing, he joined the State Ballet Institute as a technician, where he continued to take photos and later video recordings. During my years at the school I had the chance to talk to him frequently. He loved sharing stories about his career, the Opera House, and about the school itself. His photographs remain a defining part of our photo archive (Opera Digitár, 1957)
https://digitar.opera.hu/szemely/toth-laszlo-tanckari-tag/14849/

Figures 23.1 and 23.2
Gyula Harangozó, László Tóth (Keleti, 1962)



Note: Budapest, 07.01.1962 Gyula Harangozó ballet master and choreographer celebrating his 25th jubilee as choreographer with László Tóth, rehearsing his choreography "French salad" in the ballet studio of the Opera House
Photo: Éva Keleti
people shown: László Tóth and Gyula Harangozó,
Owner: MTI/MTVA/ National Archive, File name: AF__EV196201170022, public, issue date: 2011-08-05

Another valuable source that I used to identify people and gather information about them was DigiTár (digital storage), an online platform developed by the Hungarian State Opera House (Opera DigiTár, n.d.). In DigiTár, searches can be conducted by names, production, or role.

Figure 24
Homepage of Opera DigiTár (*Opera DigiTár,* n.d.)

Figures 25.1 and 25.2
Portrait of László Tóth (left) (Várkonyi Stúdió, 1957), Gabriella Lakatos and László Tóth on February 2, 1957 in Bolero (right) (Bolero, 1957)

Figure 26
Hungarian State Opera House, rehearsal of Tchaikovsky's Nutcracker depicting ballet dancer László Tóth as the puppeteer

Note: From *Hungary, Budapest district VI, Hungarian State Opera House, rehearsal of Tchaikovsky's Nutcracker. The puppeteer is portrayed by László Tóth, ballet dancer.* [Photograph]. (1961). Picture number **173757**, https://fortepan.hu/hu/photos/?id=173757. Photo given by Antal Kotnyek, https://fortepan hu/hu/photos/?donor=Kotnyek%20Antal

He also appears in our archive (*Figure 23*). This photograph, taken by him, captures the second folk dance class of 1977. His reflection can be seen in the mirror above the students.

Figure 27
The second folk dance class of 1977. In the middle Sándor Tímár.

Figure 28
László Tóth (the cameraman) and Mária Zórándi (the dancer on the right)

In this photograph (*Figure 28*), László Tóth and Mária Zórándi (right, the dancer on the left remains unidentified) are making a video recording on magnetic tape. This picture was taken at Andrássy Street 25 in the studio named after Ferenc Nádasi. The photographer is unknown, but the picture is believed to have been taken between 1972-1973.

What makes working with these old photographs so fascinating is that each image has a unique story. Beyond that, it also represents an important mission to preserve our visual cultural heritage and create a usable database for future generations. This work must be completed while the older informants are still with us.

Figure 29

Marcella Nádasi with fourth-graders on June 3, 1957

References

Bolero. (1957, February 21). (Persons shown: Lakatos, Gabriella & Tóth, László) Fotótár - Opera DigiTár. https://digitar.opera.hu/gyujtemeny/reszletek/3702/

Bujnovszky T. (2023, July 11). *Drechsler Palota W Budapest - Bánáti Hartvig Építész Iroda*. Bánáti Hartvig Építész Iroda. https://bh.hu/munkak/w_budapest/

Domonkos, E. (1971). *Magyarország, Budapest XI. - Az Állami Balett Intézet Kollégiuma*. Fortepan. https://fortepan.hu/hu/photos/?id=253011

IPTC - International Press Telecommunications Council. (2024, January 24). *Photo Metadata IPTC*. IPTC. https://iptc.org/standards/photo-metadata/

Keleti É. (1962, January 17). *Táncművészet - Harangozó Gyula 25 éves jubileuma*. (Persons shown: Harangozó, Gyula & Tóth, László) Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-NnFmOHg4TWJPM25YQlQ0U3N0ODBhZ3RBZ0xJbFQrKyt1aHFEVmxhaXc3NVFFVnhIY1JYTlAvQnFMdWYvK2Nxdw

Keleti É. (1970, June 1). *Kultúra - Évforduló - 20 éves az Állami Balettintézet*. (Person shown: Gál, Jenő). Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-Ui82WEhLWmtGYUVycGprN25jM0x0eHVGNDQzNGdyQWZNbmI4L3l5OHU3aFpsOXEwd0ZvMTNOeDZVUDA1Z0NlOA

Klösz, G. (1900). *Drechsler-palota*. Fortepan. https://fortepan.hu/hu/photos/?id=82314

Magyar Állami Operaház, Csajkovszkij: Diótörő című balettjének próbáján a bábjátékost alakító Tóth László táncművész. (1961). Fortepan. https://fortepan.hu/hu/photos/?id=173757

Magyarország, Budapest VI. - Az Operaház társulatának tagjai adományokat gyűjtenek az Országos Gyermekvédő Liga számára. (1932). Fortepan. https://fortepan.hu/hu/photos/?id=40943

Marosi L. (1959, November 20). *Kultúra - Művészet - Tíz éves az Állami Balettintézet*. (Person shown: Kiss, Ilona) Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-WE9FSVdNNGdaWVpFRVI2azRMRWdoSzZvR3VWay91bkJMWWFiZUc1RXpsaGpFYURYc1VHOGt0c0hnS2ljMXhxQg

Opera DigiTár. (n.d.). digitar.opera.hu. https://digitar.opera.hu/

PhotoShelter. (n.d.-b). *On-Site SEO: Images and IPTC Metadata*. https://support.photoshelter.com/hc/en-us/articles/360047332274-OnSite-SEO-Images-and-IPTC-Metadata#h_200c3269-15ba-438a-9cf6-d000ea3a0dd4

Tormai A. (1958a, May 11). *Oktatás - Állami balettintézet*. (Person shown: Bartos, Irén). Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-QnBBMW1keWRaV1ZLQmpzYVFjbnVHN3BnU2NpZ0pxNy85NmFHMm5Ncld6emhiQlA3MEdEd1JsRC9sdi9yNzFOag

Tormai A. (1958b, May 11). *Oktatás - Balett - Balettóra az Állami Balettintézetben*. (Person shown: Mák, Magda) Nemzeti Archívum. https://nemzetiarchivum.hu/photobank/item/FOTO-TnFKWWpVRW9QR1FqbGNaaEZRMDBIaVNpb1BoazlTWTFIOUZYai92d2QwUnhYNmRyS2V4NTdoVGtCYlFpbGlzTQ

Várkonyi Stúdió. (1957, February 21). *Tóth László*. Opera DigiTár. https://digitar.opera.hu/szemely/toth-laszlo-tanckari-tag/14849/

Note to the images: The author has been granted permission to use the photos other than those belonging to the Photo Archives of The Hungarian Dance University in this publication. HDU Photo Archives is in the process of development.

SESSION PRESENTATIONS

PÉTER LÉVAI
master teacher
Hungarian Dance University

NÓRA OLÁH
university intern
Hungarian Dance University

DÁVID DUDÁS
assistant professor
Hungarian Dance University

DIGITIZED EXERCISES TO DEVELOP RHYTHMIC SKILLS AT THE HUNGARIAN DANCE UNIVERSITY EXERCISES BY PÉTER LÉVAI

"If you don't understand what you're doing, it will show... you need intelligence to even take a step, especially to dance!" (J. Simon, a shepherd from Csenger, personal communication)

Keywords: body score, basic musical concepts, movement imagination, polyphony in the set of movements

Abstract

In the last 5 years, the BA folk dance *dancer and coach* training program at the Hungarian Dance University has introduced technical requirements related to dance technique and hand-foot independence. While this requirement is essential, it alone is insufficient for the proper representation of the dances. As increasingly younger cohorts – often with less experience in dance technique – are appearing both in the admissions process and in the university training programs, we felt it necessary to develop a specialized set of material. These materials, though independent of specific dance types, contribute to the awareness of the rhythmic elements of fast movements and body score, thereby reducing these shortcomings. In our presentation, we shared the findings resulting from these efforts (Lévai et al., 2024a).

1. Introduction

In the Folk Dance Department at the Hungarian Dance University, a variety of dance types are taught over the course of the three years of the *dancer and coach* BA program, representing three major dance dialects: the Transdanubian region, Tisza region, and Transylvanian region. To date, especially since the appearance of the two-cycle training scheme, there has been no investigation into the kind of technical and cognitive preparation dancers require both prior to and during the learning process of these different dance types (Fügedi, 2006a). Therefore, focusing on the parallel development of the basic support and gesture system, I began researching these needs 10 years ago, and five years ago I introduced a series of simple hand-foot rhythmic-acoustic exercise (Szentpál, 1976) into the etude editing module of the BA course.

The conscious memorization of movement systems and the ability to retrieve them are of primary importance in university-level practical training. Since the current BA admission requirements do not – for now – include the ability to consciously separate movements or alternate between assembly mechanisms, these skills must be developed as part of the university's undergraduate education. Knowledge of improvisational movement techniques, as well as in the combination of movements and motifs, is essential for the authentic representation of Hungarian folk dance, underlining the pressing need for a well-founded and well-structured subject requirement spanning at least two years (i.e. four semesters) within the BA program. In addition, it is crucial for instructors to consciously incorporate this knowledge into the Hungarian Folk Dance subject; if these exercises lack visible and experiential applications, they run the risk of becoming dead knowledge.

2. Theoretical Background

Stereotypically, in folk dance the motif formulas are primarily reflected through leg movements, as well as through supports and gestures. The rhythmic additions of the upper body, arms, and hands are given some emphasis, and are implemented fairly stereotypically. In addition to difficulties in managing the simultaneities and successivities in the body score in terms of weight and gesture position (Hutchingson, 2005), the implementations of staccato-legato and/or accelerando-ritardando (Tornyos, 1959) contrasts greatly increase the dancer's body awareness, tempo control, and capacity to construct an image of the body score.

The exercises I introduced (Lévai et al., 2025) related to the support-gesture body parts aim to address gaps in the technical education of folk dance and are

supplemented with relevant conceptual musical knowledge. As a result, through movement concepts and practice the dancer can better control the positioning of both individual body parts and the body as a whole across dimensions of time, space, and effort, in accordance with the principles of polyphony.

3. Pedagogical Background

3.1 Declining interest in folk dance among students over time

The learning and teaching of Hungarian folk dances take place across three levels of the Hungarian educational system. In the so-called *basic art education schools* (sometimes referred to as *elementary art schools*), folk dance training spans 12 years (Oktatási Hivatal, n.d.). At the primary school level, this includes two years of *preparatory* and six years of *basic* education. This is followed by four years of *further* education, which takes place at approximately the same time as general secondary education. This might be followed by dance-related higher education programs.

Based on the data available from the Hungarian Central Statistical Office (*Központi Statisztikai Hivatal* (KSH) in Hungarian) for *basic art education schools* in the 2019/2020 school year, the total number of students in all dance fields was 85,108 (Központi Statisztikai Hivatal (KSH), n.d.). Of these, the number of students enrolled in the two-year *preparatory* dance education was 18,409, while 61,400 participated in the six years of *basic* dance education. In contrast, only 5,299 students continued into the four years of *further* art education in dance. According to the KSH data, almost half of the dance students chose to study folk dance and a third opted for ballroom dance. This means that approximately 40,000 out of the total number of dance students at the primary school level (*preparatory* and *basic* dance education) studied folk dance. This number dropped to approximately 2,600 for folk dance at the *further* education level (secondary school age), which figures might have shrunk further since the 2019/2020 school year.

Even fewer students reach the level of higher education. Although, there are selective entrance examinations for admission into both the BA and MA *dance artist* and dance educator programs (*dancer and coach* – BA; or *dance teacher* – MA), the relatively small number of applicants compared to the expected numbers limits the degree of selectivity.

The trend outlined above clearly shows that interest in the representation of folk dance as well as its teachability is decreasing in older age groups. While an exploration of the underlying reasons is beyond the scope of this article, the trend itself

characterizes the pedagogical setting and underscores the need for the instructional materials developed by Lévai et al. (2024b), which are described in detail in Section 4 of this article.

3.2 Improving alignment with technical minimum requirements

The *folk dance artist* training at the HDU lasts for five years, the first two of which are preparatory years for students age 14 to 15. This is followed by a three-year higher education *dance artist* or *dancer and coach* training program, at the end of which students graduate with a BA *folk dance artist* or *dancer and coach* degree. In theory, students entering the university-level training should be prepared to further develop their dancing skills at an advanced level. Unfortunately, this is not always the case. To present these dances adequately and convey them authentically, a minimum technical requirement must be met; specifically, they must possess an awareness of the microstructures present in the dance motifs (Fügedi, 2006b). Even professional-level motion representation falls short if not accompanied by motion cognition (Fügedi, 2006a). Such movement representational tools of the folk dance are not paid sufficient attention during the training process. Revealing these gaps calls attention to the fact that the current educational structure might not align with evolving trends. In the 21st century, it is increasingly important to understand the distinctive character of different dance types – for example, the components of Hungarian folk dance (e.g., rhythms, dynamics, plasticity, technique, or aesthetics). Why is this important? Because we have to realize that traditional folk dance no longer exists. Its place – but not its role – has been supplanted by stage and theater dance, which operate under rules, characteristics, and goals that differ from those original village dances. If this is the case, then the stage effects and regularities require greater emphasis. While technical execution was not a major priority in traditional village settings, these technical interpretations, characteristic of different dance genres, are indispensable elements in today's stage performances. The recognition of this paradigm shift was a central consideration in the creation of the present research and methodological material.

In order to prepare dance students to professionally perform folk dance on stage, it may be necessary to break with our previous teaching practices. For most dance teachers, the most common teaching model is demonstration-imitation, in which the teacher performs the dance and the student tries to replicate it. However, due to the previously mentioned social transformations, this model is no longer sufficient in the context of folk dance, as the social class that originally cultivated this dance

culture no longer exists. In response to this shift, I developed a completely different educational model in the early 2000s that places greater emphasis on cognitive-assistive elements. This three-part model beings with movement analysis, proceeds to movement teaching, and then culminates in the movement synthesizing. The model is based on the shared movement structures between folk children's games and folk dances, with the aim of conveying them to children through experience with both direct and indirect means of pedagogy (Lévai, 2010, 2017, 2018; Pignitzkyné Lugos & Lévai, 2014).

What does paradigm shift mean in this case? It is not enough to recall the motivic variations of each small region's dance type within the three major dance dialects or to simply bring students to a common level. Without shared technical foundations, the expectation that dance students will be adequately prepared for stage performing folk dances on stage is quite naive. This is precisely why a paradigm shift is necessary.

3.3 The need for quality, specialized materials for two-cycle training

As part of the two-cycle training system, students are introduced to a range of specialized materials; among these, those that appear in the three-year BA program are especially important. The core of these teaching materials is comprised of *archival* dances, which are selected and coordinated by the instructors in collaboration with the department management. Although it is beyond the scope of this article to elaborate on what constitutes *archival dances*, it is worth noting that the current definition (with *archival* indicating those dances and dance types that have survived within village or peasant traditions) might also require revision. Moreover, shortcomings can be identified regarding the consistency of the specific materials. This deficiency is twofold. First, there is a lack of alignment between the teachers' approaches and representations. This variability and incoherence in the teacher's approach is evident in solo and group dance competitions, where the jury members influence dancer performance to a great extent. Competitors know in advance which jury member expects which theoretical and practical approach in a competition, thereby undermining the possibility of a fair and open assessment of each dance type and its performance.

Secondly, students enter university with pre-existing and often deeply embedded knowledge acquired during their elementary or secondary education. Issues arise from a lack of uniformity in students' previous training, which stems from a lack of uniformity in teacher approaches mentioned in the previous point: teachers at major dance schools often do not prioritize the formal, structural, and functional

analysis of the folk dances. Instead, – in a type of cloning process – they tend to impose their own personal style on their students. For this reason, incoming students to the university already embody these individualized approaches and backgrounds, and many are unwilling to relinquish or even refine them.

4. Developing digital teaching materials

4.1 Antecedents

As outlined in the introduction and detailed in Section 3, there has been a need for well-structured subject material with solid foundations that spans at least two years (i.e., four semesters) of the folk dance specialization of the *dancer and coach* BA program. Such materials could enable dance instructors to integrate the necessary knowledge into the *Hungarian Folk Dance* course. To address this gap and to initiate the development of the materials in question, I asked for the consent of the department head to introduce practical course materials into the training. These exercise sets were designed to be uniform, easy for the students to understand, and supportive of the development of the technical and cognitive skills that are indispensable for the representation of folk dance.

Two types of study units appeared in the training structure: (1) *Basic knowledge of etude constructing and choreography theory* and (2) *Rhythm – the basic support of dance motifs and the development of acoustic possibilities.* In both units, I devised elementary movement-creation and movement exercises, the elements of which can be found at the most elementary levels of Hungarian folk dance.

Taking into account dynamic, rhythmic, and plasticity-related interpretations, as well as the different dance types defined by Martin (1970), I first presented a set of exercises in 2019 at the International Conference on Dance Science organized by Hungarian Dance University (Lévai, 2019). These exercises, designed for Hungarian men's dances, were introduced to students from vocational secondary art schools, where I was teaching in addition to my work in the BA program. The intention was clear: if 16-year-old vocational secondary art school students were able to interpret, implement, and incorporate these tasks into an improvisational representation, then surely university students would be equally capable. The following step took place during a workshop at the 2023 International Conference on Dance Science, held at the HDU, where I presented the theoretical and practical applications of arm-leg rhythmic independence with university students (Lévai, 2023). Both presentations fully confirmed that such an endeavor has a place in the program.

Figure 1
Filming of the digital video supplement for the volume
[Photograph] by Csillag, P., 2024

Figure 2
Professional support during the filming of the video supplement for the volume
[Photograph] by Csillag, P., 2024

4.2 The process

In the field of dance, technical development is essential. Specializations such as classical ballet, modern dance, and modern ballroom dancing, while keeping pace with changing requirements, have all developed or are nearing the end of their development in terms of their performance techniques. The traditional dances of the Carpathian Basin – which can be referred to as folk dances – have the same specific technical standards of performance as these other dance genres. In the context of folk dance, I mainly focused on the interpretation of the timing of supports in relation to musical pulsation, the amount of time the support is held, and the palm-acoustic phenomena that occur during a task. This produced a collection of 24 tasks which the students had to complete online. Due to the shift to digital education during the COVID-19 pandemic, I uploaded the textual descriptions of the tasks to the university's online learning platform *Course Garden*. Students then had to upload videos of themselves executing the tasks in dance to the same online platform. This initiative ultimately sparked the development of a digital publication. It was particularly rewarding to see how two young colleagues who had recently joined the university – Nóra Oláh and Dávid Dudás – (*Figure 3*) took ownership of the project, elevating this assignment to a higher level and publishing it in the form of a university course book.

In February 2024, we began planning how to bring the project to fruition. We created a framework that clearly separated two strategic components: (1) recordings had to feature dancers capable not only of performing the basic exercises at a high level, but also of contributing additional creative interpretations of each basic exercise (*Figure 4*); (2) the exercises needed to be documented not only through written descriptions, but also using dance notation (specifically Labanotation; Guest, 2005), presented both in tabular form and as textual description.

Figure 3
Dávid Dudás, Nóra Oláh, Péter Lévai, and Alíz Körmöndi reviewing footage during the filming of the digital video supplement for the volume
[Photograph] by Csillag, P., 2024

Figure 4
Péter Lévai and Bertalan Kothenz during the filming
[Photograph] by Csillag, P., 2024

My colleague, Dávid Dudás discussed the project with Anita Lanszki, the director of the Vályi Rózsi Library, Archives and Research Centre of Dance Science, who suggested that the material could be published as a university course book. The video recordings were subsequently made in May and June 2024 in building D of the university. Valuable assistance was received from Salamon Kálmán and Balázs Kishonti in the creation of these videos (*Figures 1, 2, 5*, and *6*).

Figure 5
Filming. From left to right: Balázs Kishonti, Dávid Dudás Nóra Oláh, Péter Lévai, and Alíz Körmöndi. [Photograph] by Csillag, P., 2024

Figure 6
Filming. From left to right: Salamon Kálmán, Nóra Oláh, Péter Lévai, and Réka Mindák [Photograph] by Csillag, P., 2024

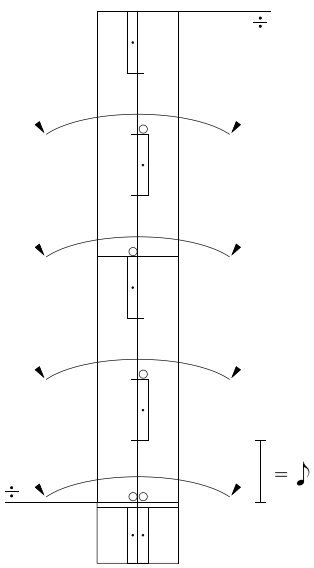
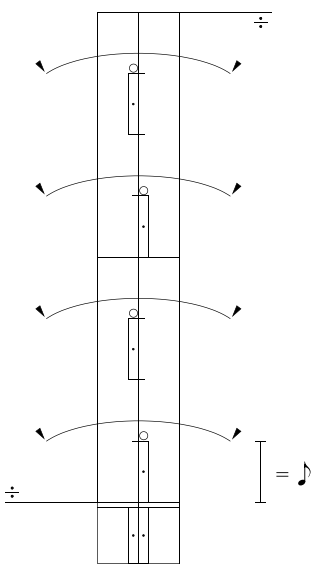
Of course, these recordings were only raw materials, which had to be edited and supplemented at a later stage – that is, they had to be made film-like. In the summer, we focused intensively on developing the main text. At that point, it became apparent that the book would need to include foundational concepts in music, movement analysis, and dance notation, while also integrating current and essential knowledge from various subject areas. These topics, to a greater or lesser extent, are already part of the training curriculum, and therefore are also suitable for deepening and refining the reader's knowledge.

4.3 The structure of the book and the digital material

After the recommendations section and the introduction, readers are first become acquainted with the rhythmic concepts, values, and their notation (*Table 1* and *Table 2*).

Table 1

The most important data from Task *c* adapted from Lévai et al. (2024b, p. 24)

Task name:	**Textual description:**	
Exercise c):	In Exercise c), both c_1) and c_2) are repeated three times each.	
Musical tempo:	120 ♩ / minute	
Pedagogical aspects:	This exercise demonstrates how similarly a movement can align with musical pulsation when performed rhythmically. During the clapping that coincides with the quarter beat, the clapping can be heard at the same intervals as the clapping of the quarter pulse in *estam*[1]. The two acoustic events are offset by an eighth note duration difference from each other. This transition presents a challenge, as during the changeover, one of the body parts – in this case the arm – must suddenly become acoustically aligned with the musical pulsation, while the support on the leg is held an eighth longer. As a variation, one component or the other can be performed not as two bars, but as a single operation (i.e., the transition takes place at four equal intervals). The *étude* relates to the smallest unit of time that occurs in the task.	
Arm rhythm:	𝅘𝅥𝅮𝄾𝅘𝅥𝅮𝄾|𝅘𝅥𝅮𝄾𝅘𝅥𝅮𝄾	𝄾𝅘𝅥𝅮𝄾𝅘𝅥𝅮|𝄾𝅘𝅥𝅮𝄾𝅘𝅥𝅮
Foot rhythm:	𝄾𝅘𝅥𝅮𝄾𝅘𝅥𝅮|𝄾𝅘𝅥𝅮𝄾𝅘𝅥𝅮	𝅘𝅥𝅮𝄾𝅘𝅥𝅮𝄾|𝅘𝅥𝅮𝄾𝅘𝅥𝅮𝄾
Subtasks:	c_1)	c_2)
Dance notation(s):		

Note:.[1] *Estam* is a way of playing [or pattern (Sárosi, 1970)] in which the accompanying instruments alternate to create a pulsating rhythmic accompaniment. Usually, the first pulse in a bar is initiated by the lower-pitched instrument, such as the bass, which plays the 'one 'or 'ones', followed by a response from a higher-pitched instrument. This *estam* style is found in the folk music of various peoples in the Carpathian Basin, including the Gypsy, Hungarian, Croatian, Romanian, Serbian, and Slovak communities (Contributors to Wikimedia projects, 2020).

In other words, *estam* is a type of musical accompaniment characterized by rhythmic and chordal instruments sounding at offset times, creating a sense of tension in the performance. In Hungarian folk music, the viola and bass are typically used to create a rhythmically complementary staccato eighth-note, which provides a distinctive, pulsating rhythmic accompaniment (Lévai, 2014).

All the information in the *Tables 1* and *3* is essential for the accurate interpretation of the task. The tables show the most important data related to the task, including what must be executed and how many times, the tempo, important pedagogical elements, the rhythmic formulas of the arm and foot parts (Gárdonyi, 1949), and their corresponding notational descriptions (Laban, 1928). Taking a closer look at the elements in the table, we first see the letter of the task in the first line, followed by the corresponding information on the number of repetitions required for each part. The second line presents the music tempo, expressed in beats per minute (bpm). The third line describes pedagogical considerations that help clarify the connections in the solutions. The fourth and fifth rows indicate the acoustic rhythmic values for the arm and foot parts. Finally, the notation records for the two exercise parts are provided.

In the second table for each task (*Tables 2* and *4*) the interpretation of the acoustically active and passive forms of a simple arm-foot movement are visualized, and two QR codes linking to the corresponding videos are included. By scanning the first QR code with a mobile phone camera, viewers can access the video recording of the basic exercise. The second QR code leads to a video recording of the *étude*-like interpretation, further developed by the students' performances.

Table 2

The interpretation of the acoustically active and passive forms of an arm-foot part adapted from Lévai et al. (2024b, p. 25)

Tabular format:

Exercise c_1 table:

sequence of movement c1 exercise	the smallest time unit in the exercise = ♪ O = acoustic active, O = acoustic passive							
	♪	♪	♪	♪	♪	♪	♪	♪
clap	O	O	O	O	O	O	O	O
right foot step	O	O	O	O	O	O	O	O
left foot step	O	O	O	O	O	O	O	O

Exercise c_2 table:

sequence of movement c2 exercise	the smallest unit in the exercise = ♪ O = acoustic active, O = acoustic passive							
	♪	♪	♪	♪	♪	♪	♪	♪
clap	O	O	O	O	O	O	O	O
right foot step	O	O	O	O	O	O	O	O
left foot step	O	O	O	O	O	O	O	O

QR codes:

Exercise:	Related etude:

Table 3
The most important data of Task *g* adapted from Lévai et al. (2024b, p. 34)

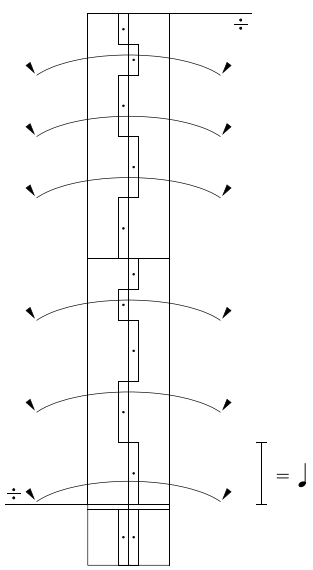
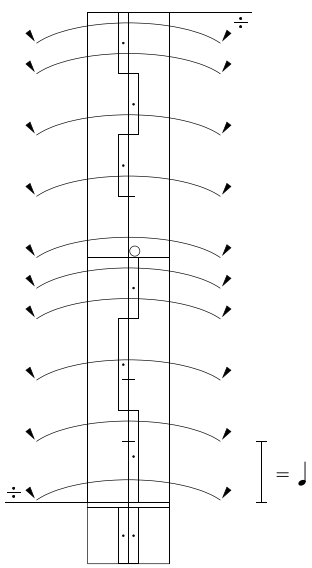
Task name:	**Textual description:**	
Exercise g):	In Exercise g), both g_1) and g_2) are repeated three times each.	
Musical tempo:	120 ♩ / perc	
Pedagogical aspects:	This exercise presents a special challenge. Unlike native dancers of Hungarian men's dances, school-trained dancers often have trouble with maintaining support on one leg for a longer period of time. This difficulty likely stems from the fact that male dancers typically practice lad's dances, in which supports must be performed quickly (in eighths) and with hops. This exercise aims to develop the dancer's ability to sustain support for a longer period of time. In the first half of the exercise (g_1), the fourth and eighth support changes are generally unproblematic. However, when performed with the inverted body part (in g_2), the duration of the first three supports is 3/8. These rhythmic parts do not align with the musical pulsations or the clapping pattern. All of this is made even more difficult by the requirement to clap during the second beat while still maintaining support. Based on experience, this task proves challenging and requires extensive practice. The table highlights how rarely support is taken in g_2 variation.	
Arm rhythm:	♩. ♩. ♩ | 𝄽 ♩♩♩	♩♩♩⊓|♩♩♩⊓
Foot rhythm:	♩♩♩⊓|♩♩♩⊓	♩. ♩. ♩ | 𝄽 ♩♩♩
Subtasks:	g_1)	g_2)
Dance notation(s):		

Table 4

The interpretation of the acoustically active and passive forms of an arm-foot part adapted from the book (Lévai et al., 2024b, p. 35)

Tabular format:

Exercise g_1 table:

sequence of movement g1 exercise	the smallest time unit in the exercise = ♪ O = acoustic active, O = acoustic passive															
	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪
clap	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
right foot step	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
left foot step	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

Exercise g2 table:

sequence of movement g2 exercise	the smallest time unit in the exercise = ♪ O = acoustic active, O = acoustic passive															
	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪	♪
clap	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
right foot step	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
left foot step	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

QR codes:

Exercise:	Related etude:

The final section of the main text of the book (Lévai et al., 2024b) contains the complete and detailed textual instructions for the exercises. Two sample instructions are provided below for demonstration purposes. These correspond to exercises *c1* and *c2*, which were introduced earlier (*Tables 1* and *2*).

> Exercise *c1*
> Starting position: we are in first position.
> First measure: we keep the support on both legs𝄾 +we step with the right leg in place ♪ + we keep the support on the right leg 𝄾 + we step with the left leg in place ♪.
> Second measure: we keep the support on the left leg 𝄾 +we step with the right leg in place ♪ + we keep the support on the right leg 𝄾 + we step with the left leg in place ♪.
> During the two measures, we clap in ♩♩♩♩ rhythm.
> Identical repetition.
>
> Exercise *c2*
> Starting position: we are in first position.
> First measure: we step with the right leg in place ♪ + we keep the support on the right leg 𝄾 + we step with the left leg in place ♪ + we keep the support on the left leg 𝄾.
> Second measure: we step with the right leg in place ♪ + we keep the support on the right leg 𝄾 + we step with the left leg in place ♪ + we keep the support on the left 𝄾.
> During the two measures, we clap in𝄾♪𝄾♪𝄾♪𝄾♪ rhythm.
> Identical repetition.

In the remainder of the book, selected excerpts from Professor János Fügedi (Fügedi, 2011) are included, specifically those that explain the essential knowledge required for reading dance notation (*Figure 7*).

Figure 7
János Fügedi, the proofreader of the university course book created by Lévai et al. (2024b)
[Photograph] by Csillag, P., 2024

5. Conclusion

With the structure illustrated by *Tables 1-4* and the digitized dance exercises and études accessible via QR codes, the published volume makes a significant contribution to teaching and learning. It provides instructors with a valuable tool for evaluating students' assignments in an objective way. This objectivity is based on the precise definition of the task, in which the components are made clear for both teacher and student. The descriptions – both textual and notational – accompanied by video recordings of the tasks, support students and evaluators in achieving accurate interpretation. Thus, without the influence of the Pygmalion effect, assessment can focus exclusively on evaluating the quality of the task.

The authors plan to continue the series, as an additional 12 exercises have already been incorporated into the course requirements. We would like to broaden the scope of the project by creating a flexible and dynamic library of examples. This expanded collection would address not only the technical requirements of arm-leg independence, but would also include exercises that enhance spatial orientation

skills, explore interchangeable movement-voices in musical metrical structures, and support the development of the rotation techniques for female dancers (Pignitzkyné Lugos, & Lévai, 2014). These would be published in different volumes, which means that, presumably, up to five volumes will comprise the full series in the not-too-distant future, as anticipated by the first author (*Figure 8*).

Figure 8
Péter Lévai during the filming. [Photograph] by Csillag, P., 2024

References

Contributors to Wikimedia projects. (2020, March 25). *Estam*. https://hu.wikipedia.org/wiki/Esztam

Fügedi, J. (2006a). A táncnot*áció hatása a mozgáskognitív ké*pess*é*g fejlőd*ésé*re. *Iskolakultúra*, *16*(11), 108–121.

Fügedi, J. (2006b). A mozdulatellentét elve néptáncaink motívumkutatásában *Folkmagazin*, *23*(3), 38–42.

Fügedi, J. (2011). *Tánc – Jel – Írás: A néptáncok lejegyzése Lábán-kinetográfiával: Szóló- és körformák. Függelékkel,* Budapest, L'Harmattan Kiadó / MTA Zenetudományi Intézet.

Gárdonyi, Z. (1949). *A zenei formák világa.* Magyar Kórus.

Guest, A. H. (2005). *Labanotation: A System of Analyzing és Recording Movement.* Fourth edition, Routledge.

Központi Statisztikai Hivatal (KSH). (n.d.). *Oktatási adatok, 2019/2020*. KSH. https://www.ksh.hu/docs/hun/xftp/idoszaki/oktat/oktatas1920/index.html

Laban, R. (1928). *Schrifttanz 1: Methodik, Orthographie, Erläuterungen.* Universal Edition.

Lévai, P. (2010). *Szökkenjünk, ugráljunk… A sárközi ugrós tanítási módszertana.* Magyar Kultúra Kiadó.

Lévai, P. (2017). *Három szólóverbunk tanítási módszertana.* Magyar Kultúra Kiadó.

Lévai, P. (2018). A mozdulattípusok és a magyar néptánc alapmotívumainak tanítási módszertana. Magyar Kultúra Kiadó.

Lévai, P. (2019). Az improvizáció értelmezése és megjelenítése a magyar néptánc oktatásának módszertanában | The Interpretation of Improvisation in the Teaching Methodology of Hungarian Folk Dances [E-book]. In A. Lanszki & E. Egey (Eds.), *VII. Nemzetközi Tánctudományi Konferencia: tánc és kulturális örökség. Program és absztraktok. | 7th International Conference on Dance Science: Dance and Cultural Heritage. Program and Abstracts*. Magyar Táncművészeti Egyetem | Hungarian Dance University. https://mte.eu/wp-content/uploads/2023/10/Tanctud-Konf-2019-absztrakt-kotet_VEGLEGES_2019_11_17-1.pdf

Lévai, P. (2023). Testszólam kísérletek a kéz és a láb ritmikai függetlenítésére. | Body Part Experiments for the Rhythmic Separation of Hands and Feet [E-book]. In D. E. Szente (Ed.), *IX. Nemzetközi Tánctudományi Konferencia. Műfajok, módszerek, mesterek a táncművészetben: Új tapasztalatok, új módszerek, új megközelítések. Program és absztraktok | 9th International Conference on Dance Science Genres, Methods, Masters In Dance: New Experience, New Methods, New Approaches. Program and Abstracts.* Magyar Táncművészeti Egyetem | Hungarian Dance University. https://mte.eu/wp-content/uploads/2023/03/Tanctud-Konf2023_web.pdf

Lévai, P., Oláh, N., & Dudás, D. (2024a). *Digital Recording of Hand and Foot Technical Exercises and Creation of a Publication in the BA Folk Dance Course* [Online]. In D. E. Szente & Á. Tongori (Eds.), 1st International Conference on Dance and Digitalization | I. Nemzetközi Tánc és Digitalizációs Konferencia. Hungarian Dance University. https://icdd.mte.eu/wp-content/uploads/2024/11/AbstractBooklet.ICDD_.2024.11.20._v3.pdf

Lévai, P., Dudás D. & Oláh N. (2024b). *Ritmikaiképesség-fejlesztő gyakorlatok a Magyar Táncművészeti Egyetemen 1.: Lévai Péter gyakorlatai.* Magyar Táncművészeti Egyetem.

Oktatási Hivatal. (n.d.). https://www.oktatas.hu/kozneveles/kerettantervek/2020_nat/iranyelvek_alapprogramok/alapfoku_muveszetoktatas

Pignitzkyné Lugos, I. & Lévai, P. (2014). *A tánc és a kreatív mozgás alapjai.* Magyar Diáksport Szövetség.

Sárosi, B. (1970). Gypsy Musicians and Hungarian Peasant Music. *Yearbook of the International Folk Music Council*, *2*, 8–27. https://doi.org/10.2307/767421https://www.jstor.org/stable/767421

Szentpál, Sz. M. (1969). *Táncjelírás: Laban-kinetográfia. 2. kötet. Kinetográfiai melléklettel.* Népművelési Propaganda Iroda.

Szentpál, Sz. M. (1973). *Táncjelírás: Laban-kinetográfia. 3. kötet. Kinetográfiai melléklettel.* Budapest, Népművelési Propaganda Iroda.

Szentpál, Sz. M. (1976). *Táncjelírás: Laban-kinetográfia. 1. kötet, második, átdolgozott kiadás. Kinetográfiai melléklettel.* Népművelési Propaganda Iroda.

Tornyos, Gy. (1959). Útmutató a zenetanuláshoz. Népművelési Intézet.

ATOMX

SESSION PRESENTATIONS

ÁRPÁD MACZELKA
head of Collection Department
Hungarian Heritage House

PÉTER MOLNÁR
head of Folklore Archive
Hungarian Heritage House

THE COLLECTION AND DIGITIZATION OF THE FOLKLORE ARCHIVE OF THE HUNGARIAN HERITAGE HOUSE

Keywords: Folklore Archive; Hungarian Heritage House; digitization, folklore, diverse collection

Abstract

Since the 1950s, the predecessors of the "Hagyományok Háza" (Hungarian Heritage House) have been producing and collecting original folklore recordings, primarily related to folk dance and folk music, as well as recordings connected to folklore movements, folklorism, and stage folklore. Additionally, the stage folk dance performances of the Hungarian State Folk Ensemble, which is part of the institution, have also been recorded. Since the establishment of "Hagyományok Háza" in 2001, these materials have been undergoing digitization. The physical media include celluloid films, videotapes, Betamax, VHS, Betacam, Hi8, miniDV video cassettes, audio cassettes and tapes, DAT tapes, manuscripts, typed documents, slides, photograph negatives and positives, and born-digital materials. To date, our institution has preserved over 315 terabytes of digitized content. The aim of this digitization effort is to make the collection accessible to a wider audience and to ensure its long-term preservation for future generations. Throughout the process, we place significant emphasis on the precise cataloging of materials, the accurate recording of metadata, and integration with our institution's Folklore Database (folkloradatbazis.hu). This article aims to showcase the diverse media carriers collected over the past 70 years, ranging from authentic folk dance and folk music collections to staged folk dance performances. Furthermore, it will outline the equipment and methods used for digitization, as well as the challenges encountered in this process.

At the Hagyományok Háza (Hungarian Heritage House), our vision is focused on raising broad social awareness and making the values of traditional culture widely accessible. We accomplish this through a variety of activities, including performing arts, public cultural education, and the maintenance of a public collection.
The institution's professional framework is supported by three core pillars:

1. The **Hungarian State Folk Ensemble**,
2. **Specialized professional groups** (including teams focused on folk music, folk dance, research and public education, folk crafts and applied folk art, database management, and networking), and
3. The **Collections Department**.

The Collections Department, as its name implies, is primarily responsible for activities related to public collections. This department operates through four distinct divisions:

- The **Folklore Archive**,
- The **Cataloging Department**,
- The **Museum of Hungarian Applied Folk Art**, and
- The **Martin György Specialized Library**.

While these divisions function as relatively independent memory institutions, their activities are closely coordinated. In line with the mission of the Hungarian Heritage House, they aim to preserve, systematize, and provide access to cultural heritage—especially artifacts and documents—while bring it to life through professionally validated narratives. Digitization is a key element in achieving these objectives.

The **Folklore Archive** plays a pivotal role in the careful preservation and storage of document-based cultural treasures, ensuring their protection in accordance to archival standards and facilitating the creation of digital versions for further use. In this paper, we aim to explore the scope of our archive's collection by outlining the types of documents we digitize, the tools we use, and the principles guiding the process. Additionally, we highlight how the resulting digital recordings are utilized and conclude with a discussion of our future plans.

When discussing what the archive includes, it is important to first clarify how the collections of the archive, library, and museum within the Hagyományok Háza differ from one another. The museum collects and preserves ethnographic, applied art, and folk-art artifacts, with an emphasis on folk applied arts. These items are documented both in the museum inventory book and in an electronic database and are showcased through temporary and permanent exhibitions.

Distinguishing between the archive and the library is less straightforward, as there is an overlap in the types of physical materials they store. For these divisions, the key

guiding principle is that the library houses any document-like materials that were or are commercially available, while the archive primarily holds unique, unpublished documents that have not been widely shared. Accordingly, our digitization efforts are focused on those collections that are otherwise unavailable or difficult to access.

To understand what the archive contains, it is first worth naming previous institutions and legal predecessors whose documents it has "inherited". The founding act of the Hungarian Heritage House references the Hungarian State Folk Ensemble (Magyar Állami Népi Együttes - MÁNE), which was officially established on March 31, 1951, as a predecessor institution. While categorized under performing arts, the ensemble also carried out ethnographic fieldwork. Similarly, the Institute of Folk Art (Népművészeti Intézet), founded in 1951, made significant contributions to the archival collection. Under the leadership of Elemér Muharay, experts such as Martin György, Ernő Pesovár, György Kerényi, and László Lajtha worked in the institute's Department of Ethnography. In 1957, this institute was transformed into the Institute of Popular Culture (Népművelési Intézet), expanding its scope to include the collection of folk dance and music, as well as the documentation of amateur art movements and other aspects of popular education. The House of Folk Dancers (Néptáncosok Szakmai Háza), established in 1981, further contributed to the archive with an extensive collection of folk dance and music recordings and transcriptions. The work of these predecessor institutions was closely linked with the Dance House Movement (Táncházmozgalom), leading to the extensive documentation of folklorism. These institutions, in collaboration with civil organizations, contributed to the formation of a large collection of textual, audio, video, and audiovisual materials, which later formed the basis of the Hungarian Heritage House's archive and library, established in 2001 (Sándor, 2022).

In addition to documents from predecessor institutions, we also preserve and digitize significant personal collections and legacies, continuously increasing our holdings through donations and collection purchases guided by the recommendations of our specialized professional groups. The sheer size and thematic diversity of the entire collection make comprehensive content analysis nearly impossible. As a result, we have several well-defined and prioritized collection units that are processed and made available with the assistance of dedicated subject specialists. The most significant of these are the MÁNE (Hungarian State Folk Ensemble) archive, the Dance House Archive founded by Béla Halmos, and the ethnographic collection videos of the House of Folk Dancers. To facilitate the detailed content exploration and ensure access to authentic folk dance and folk music recordings, the Folklore Database was established in 2001, which we will discuss later in the chapter regarding the use of digitized materials.

As of today, the archive holds 223 private collections, typically consisting of the field recordings made by the individual collectors in the course of their ethnographic work. These are complemented by collections associated with independent institutions and organizations. The main focus of the collections is fieldwork, primarily folkloric recordings, especially those related to folk music, dance, customs, and beliefs, along with some recordings dealing with material ethnography. Moreover, the archive preserves accompanying documentation from researchers, including field notebooks, catalogs, transcriptions, manuscripts, letters, and documents related to folklorism, stage folklore, folk art movements, and the Dance House Movement.

The thematic diversity of the archive is reflected in the wide range of media formats it contains (*Figure 1*). In accordance with the content, the physical media primarily comprise those used between the 1950s and the 2010s. Today, all of the recordings in our collection are created digitally, which is why our digitization efforts primarily focus on transferring analog and optical media from the period mentioned into digital formats. The largest portion of the archive consists of manuscripts and other paper-based documents, including protocols, musical scores, pamphlets, posters, and graphics. Transparent media include slides, photographic negatives, and films, mainly in 8mm, Super8, 16mm, Super16, and 35mm formats. The magnetic media is comprised of reel and cassette tapes, DAT, reel video tapes, Video8, Hi8, Digital8, DVCAM, MiniDV, Betacam, Betamax, VHS, S-VHS, VHS-C, and Umatic. The archive also stores vinyl, bakelite, and metal-labeled records. Optical media include CDs, DVDs, Blu-ray, and MiniDiscs (magneto-optical disks). In addition, it preserves born-digital materials, such as USB drives, memory cards, and SSDs.

Figure 1
Examples of the media formats held in the archive

The quantities of these media formats are estimated and outlined in *Table 1*.

Table 1
The estimated quantities of various media formats

Type	Quantity
Moving Image Recordings	8350 media items
Audio Recordings	11,500 media
Photos	73.800 items
Documents, Scores, Prints	approx. 96 linear meters
Born-digital Recordings	17 TB

So far, we have highlighted the diversity of topics and media formats that our archive is in the process of digitizing. Now, we turn to the objectives of these efforts.

First, our primary goal is to contribute to the preservation of cultural heritage. As with most memory institutions, our digitization efforts focus on safeguarding the physical condition of original media, reducing wear and tear from handling, and promoting sustainability by minimizing the use of physical materials (e.g., reducing the need for paper copies). We place special emphasis on creating authentic digital reproductions (e.g., ensuring color fidelity and accurate sizing) to guarantee the reproducibility of the original physical media. Our activities are aligned with both national and international standards, such as the *Federal Agencies Digital Guidelines Initiative* (FADGI; n.d.), the White Paper of the Hungarian National Public Collection Digitization Strategy (*Fehér Könyv: KDS Portál*, n.d.), and Europeana guidelines (Directorate-General for Communications Networks et al., 2020).

We strive to produce the highest quality recordings possible with our available equipment, preserving unaltered raw versions and performing retouching work only when necessary. These restoration efforts strictly limited to correcting degradation, improving research accessibility, and replicating the original state of the materials as captured during analog recordings without altering their content.

Preserving raw materials in the highest possible quality often presents a significant professional dilemma: does the substantial storage capacity required justify the digitization of lower-quality source materials? One of our main principles is to minimize the handling of fragile original media—ideally, limiting it to a single instance—after which only the digital copy is used for further access and dissemination.

Equally crucial is the rapid evolution of technology. Future processing methods might emerge which, especially with advancements in AI, could require higher-quality recordings to be effective.

A prime example of this is the capability of our MWA Nova Spinner film scanner, which can digitize tapes between 8mm and 35mm, capturing each frame using laser technology at resolutions up to 6K. For such materials, the resolution depth often manifests as "noise" in the digital copy. However, we cannot rule out the possibility that, in the future, an AI-powered professional post-processing system might require an input resolution of 6144 x 3160 pixels as a prerequisite.

Figure 2
MWA Nova Spinner film scanner

This brings us to the tools we utilize in our work. For video digitization, our most advanced device is undoubtedly the aforementioned studio-grade film scanner, which is capable of advanced post-production and is complemented by a professional editing workstation equipped with state-of-the-art software (DaVinci). As a substantial portion of our collection consists of videotapes, we rely on a range of specialized devices capable of digitizing various formats, including LP and SP. Examples of these are shown below (*Figures 3* and *4*):

Figures 3 and 4
Specialized devices capable of digitizing various formats

When digitizing audio media, we primarily work with formats commonly used in ethnographic research, such as reel-to-reel tapes, cassettes, and DATs. For these, we rely on the following devices (*Figures 5, 6 and 7*):

Figure 5
Devices used for digitizing audio media

Figure 6
Devices used for digitizing audio media

Figure 7
Devices used for digitizing audio media

In our digitization team's workspace, dozens of vintage recording and playback machines are in use (*Figure 8*). Since these devices are no longer in production, maintaining them often requires salvaging parts from other second-hand machines.

As a result, our workrooms (out of necessity rather than negligence) resemble an '80s-era TV and radio repair shop.

Figure 8
Tools for digitization in one room

Our archive currently maintains two storage rooms for archival materials. One is dedicated to magnetic carriers, hard drives, and magnetic tapes, which are stored on wooden shelves to prevent electrostatic or magnetic interactions. The second storage room houses primarily paper-based documents, which are stored on metal shelves in special acid-free containers. During the processing phase, we strive to remove any elements (e.g., metal staples) that could accelerate paper deterioration. The collection contains documents of a variety of sizes, ranging from A0-sized poster to smaller items such as flyers, photographs, and slides smaller than A5.

For digitization, our reprographic station plays a crucial role. A Sony Alpha 7RIV device is central in the digitization of both large-format posters and museum inventory books. The resulting 60-megapixel images are processed using *Capture One*, a software widely used by public collections worldwide.

Among our visual documents, a notable category is what we refer to as "supplementary media," which includes labels and inscriptions found on audio and video materials. These often contain critical metadata, such as recording locations, dates, or participants, which may not be evident during playback but are essential for content processing.

We maintain metadata for both physical carriers and their digital versions in detailed spreadsheets. Metadata related to media and their corresponding digital recordings are recorded in detailed spreadsheets. These generally contain the following information: acquisition date, media label (unique identifier), original label (i.e., the label used before submission), caption, attached documents, comment, type, brand, processing status (i.e., labeled, stored in acid-free, digitized, scanned), (physical) location, (placement) date, and (placement) employee. For digital copies, the metadata varies but typically includes file name, segmentation, playback speed, color encoding, mono/stereo mode, duration, and the digital path for hard disk storage.

Following the successful completion of recording and metadata annotation, there are various applications of the resulting digital copies. One of the most direct uses is their publication on the webpage of the Hungarian Heritage House. A dedicated subpage, available at https://hagyomanyokhaza.hu/hu/gyujtemenyek, offers visitors a glimpse into the institution's archival and library treasures, including the photo archive and the vibrant legacy of Béla Halmos.

Furthermore, the library and archive team works in close collaboration with the Marketing Department to provide materials for promotional campaigns across both print and social media.

The most unique utilization of our digitized recordings is their integration into the Folklore Database, which has been operational for over 20 years. In essence, this database processes authentic folklore events by segmenting recordings and categorizing their components, such as specific dances or melodies. This effort is supported by a robust thesaurus system that classifies the recording location, the informants, and additional attributes such as language, ethnicity, or performance style.

The overarching goal of the database is to create an accurate representation of folklore events. Over the past two decades, nearly 9 million connections have been made between recording segments and thesaurus entries. All recordings in the database are freely accessible, with their academic integrity ensured by a cataloging team led by ethnomusicologist Dr. István Pávai.

Our primary future objective is to develop a registration system capable of uniformly and interoperably managing the metadata for all carriers housed in the archive (e.g., for integration with platforms such as Europeana), while also enabling the display of digitized copies whenever possible. Currently, we are focused on selecting the most suitable software for this endeavor, with a strong preference for open-source solutions.

Once this step is completed, our focus will shift toward establishing a comprehensive framework for long-term digital preservation. Our goal is not only to safeguard our cultural heritage but also to make it widely accessible and encourage its utilization—in compliance with various legal requirements, particularly those related to copyright. This might even lead to the initiation of citizen science projects.

If you are interested in our collection, please feel free to contact us at archivum@hagyomanyokhaza.hu.

References

Directorate-General for Communications Networks, Content and Technology, & European Commission. (2020). Strategy 2020-2025: Empowering Digital Change. In *Europeana* (KK-01-20-183-EN-N). Publications Office of the European Union. https://doi.org/10.2759/524581

Federal Agencies Digital Guidelines Initiative. (n.d.). Retrieved January 22, 2025, from https://www.digitizationguidelines.gov/

Fehér könyv: KDS Portál. (n.d.). Retrieved January 22, 2025, from https://kds.gov.hu/feher-konyv/

Sándor, I. (2022). The Folk Art Revival and Applied Ethnography in the Hungarian Heritage House. *Acta Ethnographica Hungarica,* 66(2), 343–355. https://doi.org/10.1556/022.2021.00030

SESSION PRESENTATIONS

JÚLIA REDŐ
folk dance teacher, performer, choreographer, cataloguer director of the documentary entitled "Come to Dance!" Hungarian Heritage House

THE DIGITALIZED FOLK DANCE TREASURE IN THE FOLKLORE DATABASE OF THE HUNGARIAN HERITAGE HOUSE – OPPORTUNITIES FOR EDUCATIONAL, SOCIAL MEDIA, AND RESEARCH APPLICATIONS

Keywords: folk dance, archives, publishing, motif research, style research, documentary

Abstract

Our Folklore Database, started by ethnomusicologist István Pávai, contains a uniquely rich and authentic folk dance collection. This paper reports on the methods used for processing the data, the criteria for selecting material for publication, examples of usage, and potential directions for further development, particularly in regard to motif and style research.

Processing

- Overview of the database: quantities, sources, and temporal and geographical coverage
- The key segmentation criteria (e.g., an entire carnival recorded in its natural environment or collections curated by researchers)
- The main aspects of cataloguing
- Filtering and making decisions regarding publishing

Examples of usage

- Providing users with in-depth knowledge and broad perspectives within seconds
- Applications of the database in the field of performing arts; social media as a means of public education and promotion
- Utilizing the database for researching heritage and tradition, and using it to create a documentary

Future developments for dance research and study

- Potential developments to the system to support motif analysis, style research, among other opportunities.

1. Introduction

This paper introduces the digitalized folklore database of the Hungarian Heritage House. Our system was conceived and developed by ethnomusicologist István Pávai and his colleagues, originally focusing on the systematization, research, and publication of folk music. The database also has a rich folk dance collection, which is curated and published together with its corresponding music.

After briefly presenting the methods for processing the data, this article will explore how further developments could enhance the system's effectiveness and user-friendliness, enriching folk dance research and education. Additionally, through the example of a recently completed documentary produced by the author, the first of its kind, the paper demonstrates that the meticulously catalogued database is not only a resource for studying dance and music, but can also be applied to the study of customs alongside approaches from other sciences.

2. About our database and process

2.1 Data

We are constantly expanding our collection with materials received from ten institutions as well as numerous professional and amateur collectors, enriching it with complete lifeworks and legacies. Currently, our folk dance collections span from 1948 to 2013. Since processing and publication are ongoing, I use approximate figures to represent the most recent trends in our dataset.
Our database contains:

- 400 hours of dance recordings
- Materials from over 200 settlements
- 2,800 informant dancers
- 14,700 segments of dance
- More than 900 media items
- Approximately 950 documented dance collection events

Among these:

- 131 recordings capture dance occasions in their original environment, representing authentic folk customs (marked in orange or medium grey in the monochrome version on the pie chart – Figures 1 and 2)

- Around 450 collections were organized specifically for dance research (marked in red or dark grey in the monochrome version on the pie chart – Figures 1 and 3)
- 330 recordings document revival events such as festivals, dance camps, or dance houses (marked in yellow or light grey on the pie chart – *Figures 1* and *4*).

Figure 1
Data from different collection events (fieldwork, revival event, organized collection event)

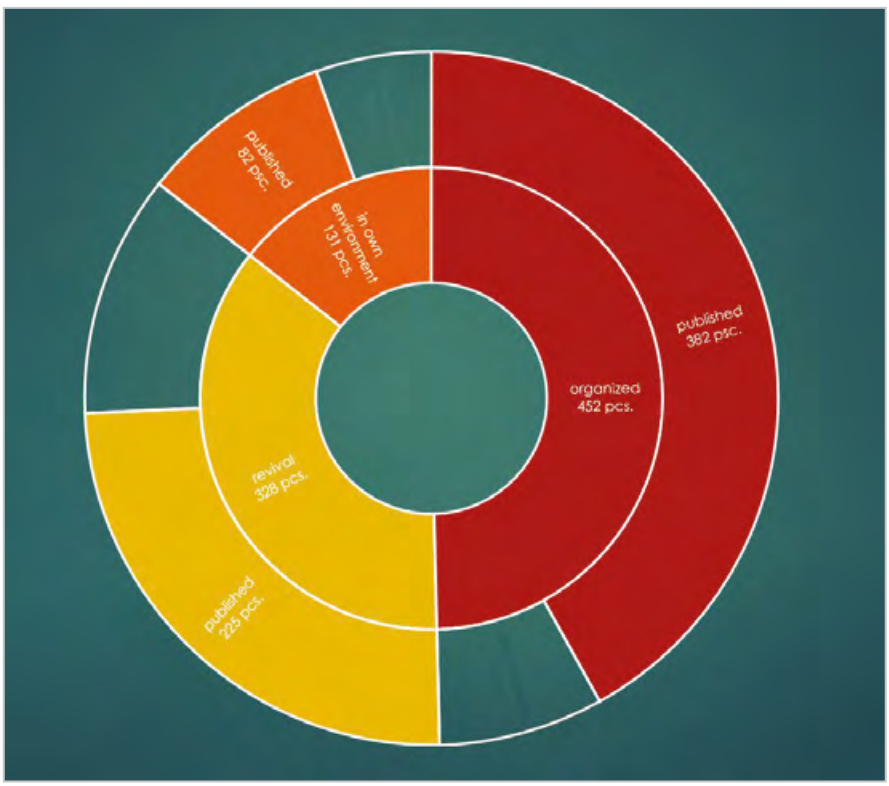


Figure 2
A recording of a dance occasion in its original environment (fieldwork, administrative interface)

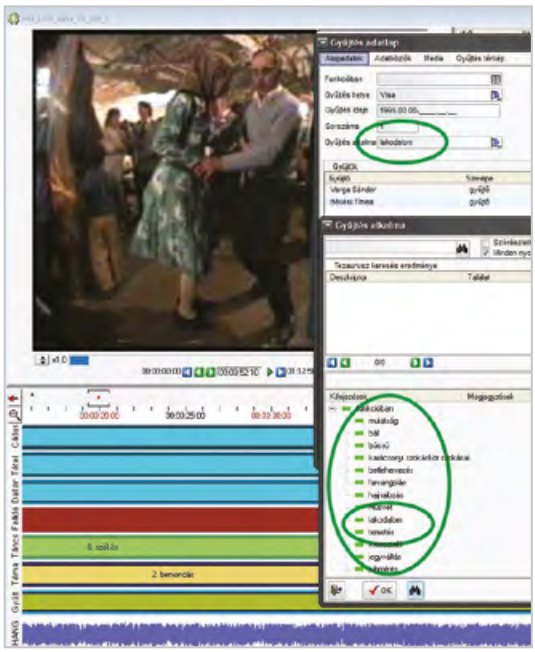
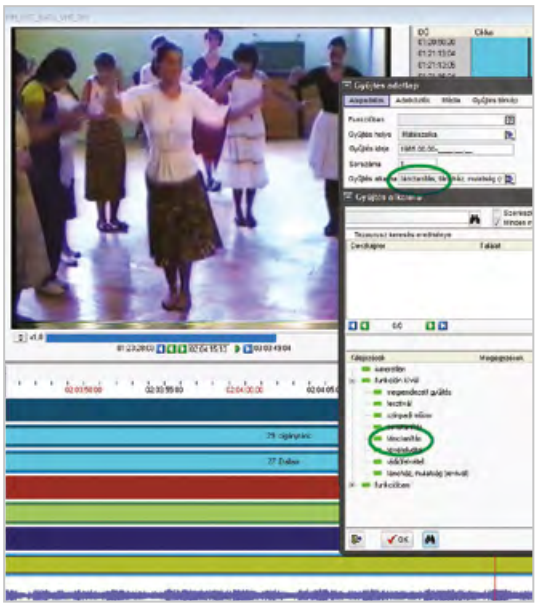


Figure 3
A collection organized specifically for dance research (administrative interface)

Note: The Hungarian expression 'megrendezett gyűjtés' circled in green means that the collection was organized specifically for dance research

Figure 4
A collection occasion at a revival folk dance camp event (administrative interface)



2.2. Pre-cataloging and segmentation of the events

During the pre-cataloguing phase, each collection event is assigned a unique identifier that indicates the date, location, and names of the collectors. The recorded event is then segmented into different parallel tracks. The following list shows these tracks starting in descending order from top to bottom (*Figure* 5). In this way, we can create distinct types of tracks:

1. **Cycles** As referred to by the informants, a *cycle* (approximately translated as "a couple's dance") consists of several consecutive dance sections traditionally performed without interruption.
2. **Dance sections** – These tracks correspond to specific dances which have separate designations used in villages, such as *verbunk*, *csárdás*, and *szapora*. These can denote information about the dancer or dancers (e.g., male, female, or couple) or the tempo and pulsation of the dance or music. For example, *csárdás* is slower, while *szapora* is faster, and they are usually danced in this order.
3. **Melody tracks** – These tracks distinguish the different **melodies** played or sung by the musicians and/or the dancers in a given section.

4. **Folklore text tracks** – These include song lyrics and "dance rhymes" (*csujogatások*), which are shouted by the villagers during the dance. Other traditionally fixed texts can also appear on these tracks, such as greetings for name days or other ceremonies.
5. **Dance tracks** – By definition, the dances captured in the video recordings are segmented into sections. In cases in which there are multiple dancers in one section dancing one after another, videos may be further segmented for each dancer.
6. **Text theme tracks** – These contain data about the informants and the collection events themselves. Interviews are also included for these tracks, segmented by themes (e.g., discussions about different customs, the organization of dance events, dance etiquette, or details about the process of learning a particular dance). Biographical stories of dancers and musicians may also be featured in these tracks.
7. **Visual theme tracks** – These provide insights into traditional customs and rituals, such as a carnival celebration (*Figure 6*), They also document dance etiquette, including how dancers invite partners to dance, change partners during a dance, or express gratitude at the end of a performance (*Figures 7* and *8*).
8. **Collection event track** – This track represents the recorded collection event in its complete form.

Figure 5
Administrative interface: segmentation of audio and visual content of the recorded event into parallel tracks

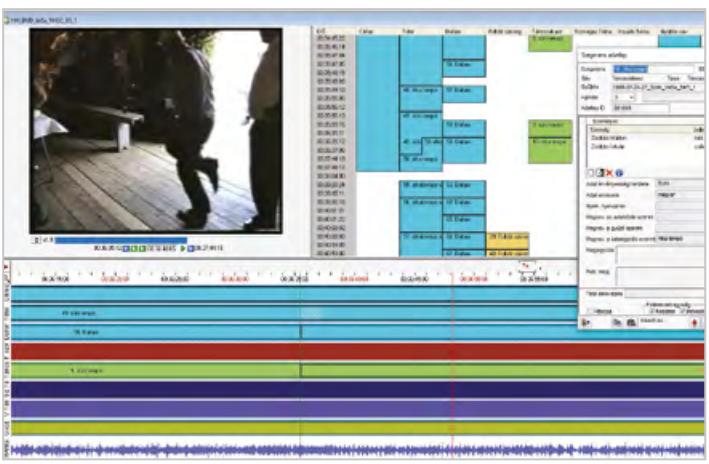


Figure 6
Visual theme track of a carnival custom: a masquerade ball (administrative interface)

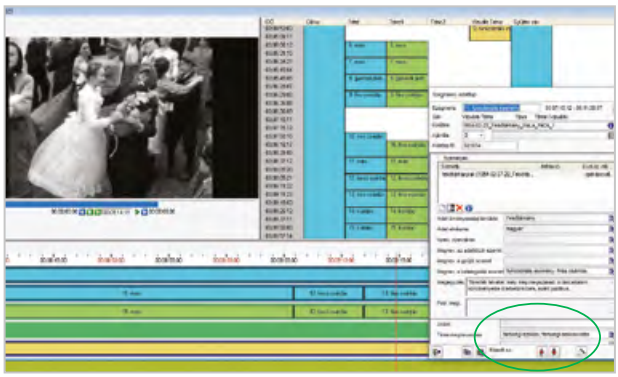


Figure 7
A visual theme track documenting dance invitation etiquette (administrative interface)

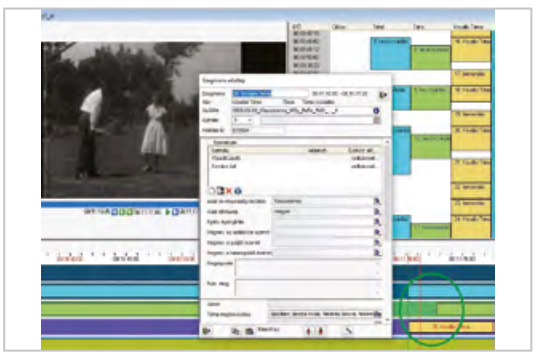


Figure 8
A visual theme track documenting the etiquette of thanking a dance partner (administrative interface)

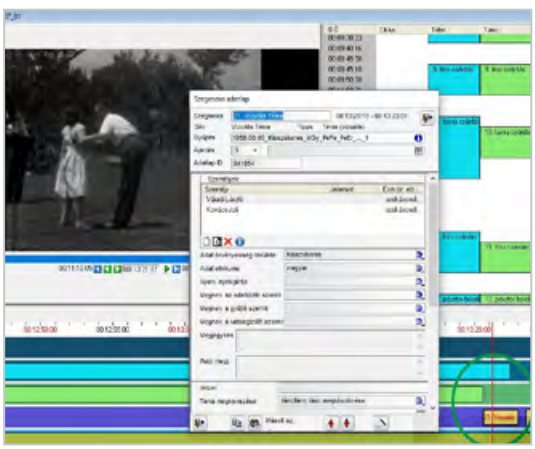
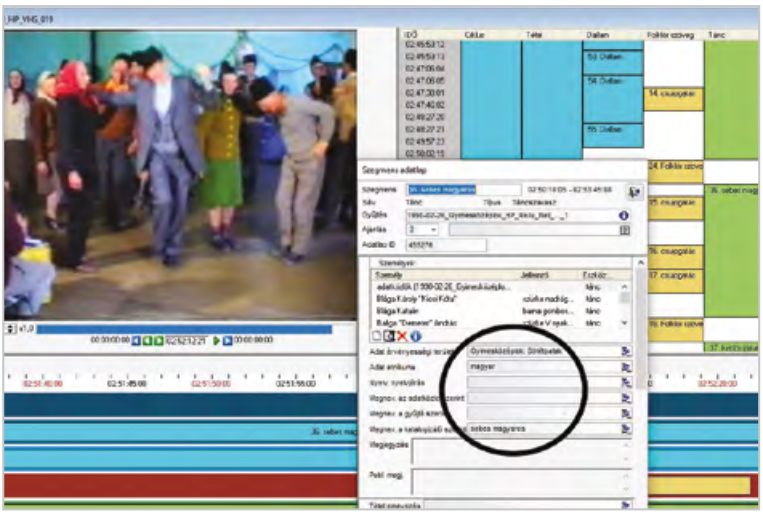


Figure 9
Datasheet including event date and location, performers, village/dialect name, ethnicity, and dance name (administrative interface)



2.3 Cataloging

Each segment is accompanied by a datasheet, which – when possible – includes the identified performers, the dialect-specific names of the sections, and the associated ethnicity (e.g., Hungarian, Romanian, Romani, or other folklore traditions). Moreover, the datasheet specifies the micro-, medium- and large-dialect regions to which the dance and its accompanying music belong to (*Figure 9*). Furthermore, we generate searchable keywords for transcripts of visually documented interviews and folklore events.

2.4 Publishing

Regarding the criteria for publication, the following video (*Video 1*) presents selected examples of the key elements that a prioritized for annotation or, in some cases, filtering out content from the published recordings.

One such element to consider is the presence of revival dancers in the recordings. This is illustrated in the first linked video through three example cases. The first two cases feature a lad's dance and a couple's dance, both recorded in Sic (*Szék* in Hungarian; Cluj County, Transylvania, Romania), when the revival dancers are the collectors themselves. Not only do they perform these dances with remarkable authenticity, but they also wear traditional costumes. (In the recording, the first man

and the first woman, who is wearing red traditional folk costume and dancing towards of the camera, are revival dancers.) This is not an unusual case, as researchers often develop close and friendly relationships with local communities, who may lend them traditional clothing, allowing them to experience the feeling of dancing in traditional attire. When deciding on publication criteria, it is important to distinguish between revival dancers who may appear in traditional costumes, and informant dancers, who may perform in urban civilian clothing, having already shifted away from traditional practices. The third case, appearing at the end of this same video features a Japanese collector with his back to the camera, performing a male dance from Mera (*Méra* in Hungarian; Cluj County, Transylvania, Romania) called the *legényes* by the locals. While his execution is very precise, it is important to recognize stylistic differences in his performance.

When identifying specific movements, we sometime decide not to publish the dance, or alternatively, note the presence of revival dancers in the datasheet.

Video 1
https://youtu.be/OF2XdAWJtRw
This video contains elements of two different collections (*Folklóradatbázis* | *Folklore Database*, (n.d-c.; n.d-a).
1 https://folkloradatbazis.hu/event/CE70C184-BD8F-42E8-8B0A-B319DD78E2C7/1998-02-01_Szék_VaSa_BeTi_1/segment/1534147/VaSa_V8_012_1_00-33-15_00-34-48
2 https://folkloradatbazis.hu/event/DCB49CD1-2ACB-42C0-BCE4-A201C93FFA52/0000-00-00_Méra_ToAn_2/segment/1382548/ToAn_VHSC_002_00-22-27_00-23-45

Another key criterion is whether the dance performance is truly traditional. In some cases, informants may attempt to assist during interviews but struggle to accurately recall their past experiences. Similarly, at post-festival balls, the camera may capture dancers from a neighbouring region dancing to the music of a band from another region. The video linked below shows an occasion where women attempt to recall the spinning movement that they were used to doing during the lad's dance. Traditionally, this dance is characterized by quarter-note steps, but in this case, they are doing eighth-note steps instead.

Video 2

https://youtu.be/0X1HL2lJBO0

Folklóradatbázis | Folklore Database. (n.d-f.). https://beta.folkloradatbazis.hu/event/81AD0F54-4EAC-4C1D-A48A-233F3494DBF1

In the last example, a village dance group is shown performing on stage at a festival. Although they are traditional dancers, they change their original dance style to conform to current customary stage rules. These changes in presentation are also filtered out from the published collection.

Video 3

https://youtu.be/HFHr8-u5ffI

3. Detailed search on the user interface

Users can also choose a settlement from the map (https://folkloradatbazis.hu/map) to explore its traditional dance and music *Folklóradatbázis | Folklore Database*. (n.d-g.).

Through engaging and often personal stories in the form of articles commemorating anniversaries or analysing dances, we provide additional information to the recommended collections that may arouse users' curiosity. These materials frequently generate thousands of views, expressions of appreciation, and shares on social media (Redő, 2021): https://folkloradatbazis.hu/article/6695F613-3038-4C28-A1BC-7E318CAFAF6D.

For users with a specific research interest, by using the catalogue's detailed search function presents them with a complete list of materials from a given genre. With just one click, they can access information related to the folklore of a given ethnicity, a specific dancer, or the work of a particular collector (https://folkloradatbazis.hu/detailed-search).

A key advantage of our published collection is that it is possible to search according to dance occasions or folk customs. This enables users to examine how a dance is embedded within broader folk customs, providing deeper understanding into the meanings behind the movements and the connections that determine the dance style (*Folklóradatbázis | Folklore Database*, n.d.-h): https://folkloradatbazis.hu/event/4E6FCD53-2BAF-4041-9DB3-590EFEC7FAFF/1990-04-22_Méra_ToAn_1/segment/1384311/ToAn_VHSC_026_00-03-23_00-04-39.

All these segments are not only viewable but can also be downloaded and shared via email to specific recipients.

4. Areas of use

4.1 Art work

The illustration below presents an example from the *"Then and Now"* series, created by our institute in collaboration with the dancers of the Hungarian State Folk Ensemble. Here we can see how the performers learn original dance sequences from our archived original recordings with consistent accuracy and stylistic authenticity in their performances.

Video 4
https://youtu.be/1WbebDbWi7E
(Folklóradatbázis | Folklore Database, n.d-e). https://folkloradatbazis.hu/event/33D46018-B010-4C55-B328-2AE7DA8C61F3/1999-01-31_Szépkenyerűszentmárton_VaSa_1/segment/1283162/VaSa_V8_016_2_00-35-06_00-36-41

The informant dancer is János Lőrincz; the professional dancer is Márton Opiczer (Hungarian State Folk Ensemble)

The next linked video is an example of how dance research can be transformed into an all-night stage performance.

Video 5
https://youtu.be/ExHCmOhibsU
Same source as the previous video

4.2 Research and creative work

I can provide a more detailed account of another field of use: creative work in research and public education, as this was the focus of a recent project of mine. In the study of dance etiquette, we have access to a substantial wealth of material drawn not only from interviews but also from spontaneous, authentic moments captured during dance events. My specific research centred on the unwritten rules related to dance invitations, the consequences of breaking these rules, and the diverse ways partners invite each other to dance. Given the limited number of studies and articles at my disposal, our catalogue, containing nearly 300 segments related to dance invitations, proved invaluable to the research. This theme is particularly interesting, as these invitations mark the very first moment of every couple dance. No matter how brief the manifestation, they represent

a decisive transitional phase. On one hand, they can be considered dance movements in themselves as well as everyday gestures; on the other hand, they may follow fixed rules and movements, yet can emerge passionately as spontaneous manifestations.

What is perhaps even more compelling is that with the help of these captured moments, we can compare the unwritten rules conveyed during interviews – consciously passed down through generations in village communities – with how these norms functioned in real-life interactions within mature male-female relationships.

The invitation to dance often serves as a symbolic reflection of the relational roles that can be perceived in the dance itself. Accounts reveal instances of humiliating punishments or exclusion for a girl who refused a boy's invitation or who took the initiative herself by asking a lad to dance, actions that challenged the traditional role of boys in decision-making and initiating dances.

At the same time, there are also examples of mature men and women in working relationships where the village community and musicians fully accepted a woman's open initiative to decide with whom and when she wanted to dance. These instances contrast sharply with the verbal admonitions of the villagers.

In the documentary I produced, the digitized and systematized data allowed us to gain insight into this aspect of daily life in previous generations. Through new interviews and joint conversations, we also conducted research in contemporary dance houses, engaging with randomly selected participants from different generations to examine how these traditions affect their lives and habits. An overview of both past and present customs can be found in in the documentary "Come to dance!" (Redő, 2024). The following video is a preview of the 30-minute film.

Video 6
https://youtu.be/MZzADOqzYIQ
Details of the collections are provided at the end of the film.

5. Development opportunities for teaching and researching motif and style

In this final section, I introduce a particularly intriguing topic: with further development, our system could offer exceptional opportunities for research and pedagogy in several important areas:

- motif research
- style research
- researching the editing of original dance processes
- the relationship between musicians and dancers

- individuality research
  - changes in dance across different ages
  - variations in dance with different partners
  - adaptations of dance across different occasions
- comparing performers
- comparing villages within dance dialects
- shifts in public dance preferences over decades within a village or dialect area
- examining different presentation methods and the characteristics of basic motifs across different dance dialects
- dance education.

To model this approach, I segmented and catalogued the dance process of one of the informant couples recorded by folk dance researcher and collector Sándor Varga. The dancers featured include János Fodor "Selyem" and his wife Erzsébet Jánosné Fodor

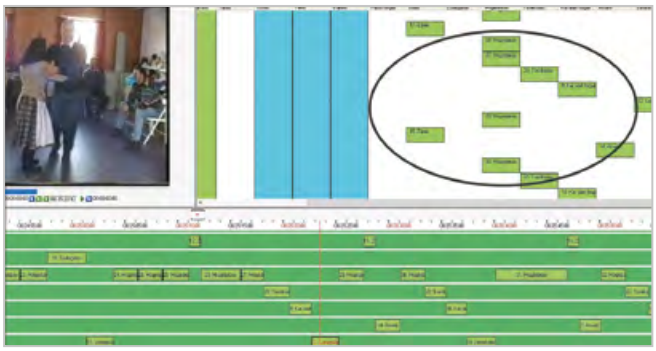
5.1 Different tracks for recurring dance elements

I created parallel dance tracks for the distinct and recurring elements of dances. In Hungarian folk dance terminology, these elements are referred to as motifs. These motifs are broader families of movement, allowing dancers to introduce variations, accents, or gestures. By examining each motif in its designated track, we can analyse frequently if/how the couple performs them consistently and what variations they incorporate.

After further development, it may also become possible to study these patterns by searching for the name of the specific motif through the user interface. This process resulted in the following tracks, arranged from top to bottom (*Figure 10*).

1. couple turning (Fügedi et al., 2020)
2. ending motifs (these include direction-changing steps during couple turning and movements in which the man leads the woman behind his back and she spins in place before they reconnect.)
3. luring motifs (Fügedi et al., 2020)
4. motif in which the man leads the woman behind his back, and she spins in place, before they reconnect
5. motif in which the couple reconnects, and the man prepares to spin the woman under his arm
6. spinning the woman under the man's arm
7. approximate casting across motifs (Fügedi et al., 2020)
8. connecting motif: the man slowly rotates while moving from one side of the woman to the other.

Figure 10
Motif segmentation highlighted in the screenshot of the administrative interface for studying a dance process



5.2 Editing of dance elements

By examining the segment map in the right corner of the monitor (*Figure 10*), the editing mindset of the dancers becomes clearly visible. The map effectively shows the place and frequency of each motif. We can also observe which motifs the dancing couple tend to perform in succession.

How often are these motifs used? Is it merely a decorative element, or does it serve as a defining feature of the dance? For instance, the couple in this example uses the "approximate casting across" motif far less frequently than is commonly observed in this dance dialect.

5.3 Connection with the music

Moreover, we can hear the exact melody and musical accents that inspired the dancers in that moment. The live connection interactions between the dancers and musicians – in the form of movements and musical accents – can be studied very easily and precisely.

Video 7
https://youtu.be/IlWt5QDZHUs

5.4 Dancing personality research

If detailed motifs searches become possible, such as searching for "couple turning" motifs from Vișea (Visa in Hungarian; Cluj County Transylvania, Romania) or

"leading the woman behind the man's back" motifs, this feature could serve as an anthology of motifs and their variations, not just from a single recorded event but across all available recordings of a particular dancer. In some fortunate cases, we can even trace a dancer's evolution over the years, revealing **how dance changes as one grows older**. It is exciting and also educational to see how a movement is performed when a dancer is young versus later in life. For instance, a dancer may no longer be able to jump as high or strike their boot with the same force, instead choosing another gesture containing humor. Additionally, some movements or motifs are not solely connected to the music but to the relationship between the male and female dancers. Studying how the characteristic of a movement in different contexts and through varied expressions helps us to understand the main intention and content of a movement, thus enabling us to interpret a dance in its original style.

It is also interesting to study how a villager's dance style changes **with different partners**. What aspects does a particular dancer consider about his dance partner and what elements of dance remain consistent regardless of their partner? What do they find inspiring or deserving of empathy and consideration when it comes to their dance partners? How does this differ between male dancers, as leaders of the dance, and female dancers, as followers? How does this differ in cases when the couple is in almost constant physical contact compared to cases when they are not touching each other, but unquestionably form a dancing couple?

5.5 Village characteristics and broader dialect regions

All of these aspects of motif research can, of course, be examined not only on the level of the individual dancer but also for an entire village or even for a broader dialect area by comparing different informants. By studying similarities, variations, and the factors involved in choosing the used motifs, identity features typical of the village and dance regions in question can be easily and accurately drawn: this includes elements that remain the same in a given region and those that are characteristic of a specific dancer's individuality, while still keeping to the main rules of the dance dialect.

We can also examine whether public taste in dance has evolved over the decades by studying the recorded dances of several individual informants from a given area.

5.6 Dance pedagogy using this system

In addition to its research applications, the system discussed in this paper can also serve as an excellent tool for learning dances. By analysing the moments preceding

each step (i.e., starting from the weight-bearing leg), learners can repeatedly return to starting points of the motifs, allowing them to practice a particular motif together with an informant dancer examining all the small details of the style. This approach provides opportunities to a wide range of users to harmonize their movements with those of the informant dancers, which greatly enhances their ability to understand and internalize authentic dance.

6. Conclusion

Our database represents a treasure trove of enormous value not only for those interested in folk dance, be they researchers, creators, professional dance teachers, or the general public, but also for scholars in the social sciences and creative artists.

With additional development, further progress and decisive realizations can be reached when examining the relationships between content and form in dance.

In this way, we can gain a deeper understanding of improvised folk dance, a remarkable expression of human culture. As our goal is to dance more consciously, in addition to celebrating and keeping folk dance alive through stage performances, we also want to stay true to its original function: the experience of intimate relationships in dance. Due to our increasingly digitalized world, we seek to learn from our own crystallized, spontaneous, and well-functioning means of creating connection.

References

Folklóradatbázis | Folklore Database. (n.d.). Retrieved February 6, 2025, from https://folkloradatbazis.hu/detailed-search

Folklóradatbázis | Folklore Database. (n.d-a). *Méra, lakodalom. Collector: András "Cucus" Tötszegi*. Retrieved February 6, 2025, from https://folkloradatbazis.hu/event/DCB49CD1-2ACB-42C0-BCE4-A201C93FFA52/0000-00-00_Méra_ToAn_2/segment/1382548/ToAn_VHSC_002_00-22-27_00-23-45

Folklóradatbázis | Folklore Database. (n.d-c.). *1998.02.01. Szék, megrendezett gyűjtés. Collectors: Sándor Varga & Tímea Békési*. Retrieved February 6, 2025, from https://folkloradatbazis.hu/event/CE70C184-BD8F-42E8-8B0A-B319DD78E2C7/1998-02-01_Szék_VaSa_BeTi_1/segment/1534147/VaSa_V8_012_1_00-33-15_00-34-48

Folklóradatbázis | Folklore Database. (n.d-d.).*1998.02.06. Visa, megrendezett gyűjtés. Collectors: Sándor Varga, István Megyeri & Tímea Békési.* Retrieved February 6, 2025, from https://folkloradatbazis.hu/event/7E0DF8E2-66B2-4CB9-B21A-EA5CB5EDB44F/1998-02-06_Visa_VaSa_MeIs_BeTi_2/segment/1274997/VaSa_V8_013_1_00-21-58_00-28-33

Folklóradatbázis | Folklore Database. (n.d-e). *1999.01.31. Szépkenyerűszentmárton, megrendezett gyűjtés. Collector: Sándor Varga.* Retrieved February 6, 2025, from https://folkloradatbazis.hu/event/33D46018-B010-4C55-B328-2AE7DA8C61F3/1999-01-31_Szépkenyerűszentmárton_VaSa_1/segment/1283162/VaSa_V8_016_2_00-35-06_00-36-41

Folklóradatbázis | Folklore Database. (n.d-g.). Retrieved February 6, 2025, from https://folkloradatbazis.hu/map

Folklóradatbázis | Folklore Database. (n.d.-h). Retrieved February 6, 2025, from https://folkloradatbazis.hu/event/4A4713DF-0C63-4C4D-A07B-3F00749AAC84/0000-00-00_Méra_ToAn_3/segment/1384879/ToAn_VHSC_037_00-00-00_00-05-12

Fügedi, J., Quigley, C., Szőnyi, V., & Varga, S. (Eds.). (2020). Foundations of Hungarian Ethnochoreology: Selected papers of György Martin. Research Centre for the Humanities Institute for Musicology / Hungarian Heritage House. https://db.zti.hu/neptanc_tudastar/pdf/biblio/l01928.pdf

Julia Redo. (2025, January 31). *1. video* [Video]. YouTube. https://www.youtube.com/watch?v=OF2XdAWJtRw

Julia Redo. (2025b, January 31). *2. video* [Video]. YouTube. https://www.youtube.com/watch?v=0X1HL2lJBO0

Julia Redo. (2025c, January 31). *3. video* [Video]. YouTube. https://www.youtube.com/watch?v=HFHr8-u5ffI

Julia Redo. (2025d, January 31). *4. video* [Video]. YouTube. https://www.youtube.com/watch?v=1WbebDbWi7E

Julia Redo. (2025e, January 31). *5. video* [Video]. YouTube. https://www.youtube.com/watch?v=ExHCmOhibsU

Julia Redo. (2025f, January 31). *Come to Dance Preview 121 sotet veg v21* [Video]. YouTube. https://www.youtube.com/watch?v=MZzADOqzYIQ

Julia Redo. (2025f, January 31). *7. video* [Video]. YouTube. https://www.youtube.com/watch?v=IlWt5QDZHUs

Redő, J. (2021, April 23). *Élménybeszámoló a sötétpataki kultúrából*. Folklóradatbázis | Folklore Database. https://folkloradatbazis.hu/article/6695F613-3038-4C28-A1BC-7E318CAFAF6D

Redő, J. (2024). "Jössz táncolni!" Exam documentary to Lumiere Filmschool. Teacher: Tamás Almási.

SESSION PRESENTATIONS

SZOFIA TÖLLI
PhD student
Art Studies, Doctoral School
University of Theatre and Film Arts

THE CHANGING ROLE OF MENTORING IN SOUTH-EAST ASIAN CLASSICAL DANCE FORMS: A QUALITATIVE APPROACH

Keywords: mentoring, classical dance, digitalization, South-East Asia, dance pedagogy

Abstract

This paper explores the evolving role of mentoring in South-East Asian classical dance forms amid the growing influence of digitalization. Traditionally, these dance forms have relied on an intimate *guru-shishya* (mentor-student) relationship, in which the in-person transmission of knowledge, technique, and culture is paramount. However, with the increased use of digital platforms, the mentoring process is undergoing significant transformations. The formerly personal mentorship dynamic is being redefined through online classes, pre-recorded tutorials, and interactions via social media.

This research investigates how digital tools are influencing both the accessibility of learning and the depth of mentor-student relationships in the context outlined above. Employing a qualitative approach, the study draws on interviews conducted with dancers, gurus, and students from various international backgrounds. The findings reveal a paradox: while digitalization democratizes access to dance education, it risks undermining the depth of cultural transmission that is essential to these forms. Although this topic has been discussed across various forums, it has not yet been fully explored in the academic literature. This research aims to address that gap by examining the opportunities and constraints presented by digitalization, emphasizing the need to balance new tools with the preservation of classical mentoring traditions. By contributing to this ongoing conversation, the present study highlights how technology both challenges and redefines traditional notions of dance education and mentoring.

1. Introduction

It feels safe to be under the watchful eyes of the guru, because we've been part of that guru-shishya parampara. The guru, the guru's presence is a motivation, an inspiration.

1.1 The Mentoring in South-East Asian Classical Dance Pedagogy

Mentoring has long been the cornerstone of South-East Asian classical dance pedagogy, deeply embedded in the *guru-shishya parampara*[1] system. This traditional model emphasized not only technical mastery but also philosophical and cultural immersion, with students often residing with their gurus. This system, called *gurukula* (also *gurukulam* or *ashram*), reflects the ancient education system in India in which students (*śiṣya*) were sent to live in the homes of teachers (*guruji*) to learn (Cheng et al., 2002, p. 194).

Within this framework, knowledge transmission was holistic, encompassing rigorous physical training, theoretical understanding, and ethical or spiritual guidance. The mentor-disciple relationship was cultivated over years of close personal interaction, fostering discipline, devotion, and an embodied understanding of artistic expression. While dance forms may serve different goals (e.g., social interaction, celebration, therapy, artistic expression, or spiritual connection) and dancers may pursue different objectives through dance (e.g., professional career path or recreation), the traditional method for learning movement remains rooted in person, in a *body-to-body* context in which the teacher works closely and in direct contact with the learner (Cisneros et al., 2019, pp. 54-72; Chan et al., 2011, pp. 187–195). This system can be found across all eight classical dance styles of India (Rama Devi, 2023)

However, the rapid digitalization of dance education, particularly since the early 2000s, has significantly altered these pedagogical structures. While online platforms and digital tools offer greater accessibility and wider dissemination of classical dance forms, they also pose challenges regarding authenticity, depth of engagement, and the preservation of traditional teaching methodologies. These concerns have become particularly pronounced in the wake of the COVID-19 pandemic, which necessitated a abrupt shift to virtual instruction. In some cases, the application of digital platforms into dance education (across various levels) has proven to be beneficial for enhancing learner motivation (Koutsouba, 2016). While Koutsouba argues that there is currently a demand to supplement or even replace face-to-face classes with those conducted online due to the flexibility and personalized experience that they can provide

[1] Foreign names and words transliterated into English.

(Koutsuba, 2016 citing Anastasiades, 2007, 2014; Giossos et al., 2008; Lionarakis, 2001, 2006; Red, 2005; Vergidis et al., 1998), drawing on my personal experience, I hypothesize that in the case of traditional Indian temple dances, this demand is more aligned with the globalization of these styles and limited access to direct mentorship. Even so, Koutsuba acknowledges that the pedagogical value of digital tools – in the paper, specifically YouTube – depends largely on how they are used (Koutsuba, 2016).

The pandemic-induced shift to online learning has raised critical questions: Can digital platforms replicate the embodied experience of direct mentorship? How do technological adaptations impact the transmission of nuanced artistic and cultural knowledge? To what extent does remote learning affect the teacher-student dynamic that has historically been at the heart of classical dance training? I hypothesize that digital tools and online learning can play an important role, such as remote learning in the case of temporary physical separation from the *guru*. Digital classes may also serve as an effective means of sparking interest among beginners and provide advanced students with opportunities to revise choreographies.

In recent years, there has been an interest in researching traditional dance through emerging technological tools. For example, one laboratory project aimed to extract semantic meaning using a machine learning system that analysed the body movements of classical performances (Mohantyet al., 2016).

This paper investigates these transformations through qualitative research methodology, drawing on in-depth interviews with established dancers, choreographers, and educators, alongside personal observations of both traditional and digital learning environments. By analysing the intersection of tradition and innovation, this short study aims to provide a closer understanding of how South-East Asian classical dance pedagogy is evolving in response to digitalization.

1.2 Personal Perspective and Research Scope

Having trained in Odissi since 2009 under the guidance of esteemed practitioners, my journey in classical dance has been deeply shaped by traditional pedagogical structures. A particularly formative experience was my immersion in a *gurukula*-like institute in India during 2012 and 2013, where I had the opportunity to not only refine my dance technique but also engage with the holistic lifestyle that traditionally accompanies the learning of South-East Asian classical dance forms. This period of residential training underscored the profound impact of close, sustained mentorship, one that extends beyond technical instruction to encompass philosophical, cultural, and even spiritual dimensions of the art form.

Building on these personal experiences, this research seeks to examine how digital platforms are reshaping the mentor-disciple dynamic in South-East Asian classical dance pedagogy. While online tools have facilitated greater accessibility to training, allowing dancers across the world to learn from esteemed gurus without geographical constraints, they also introduce significant challenges. Questions arise concerning the authenticity of transmission (due to the lack of esteemed practitioners and gurus on digital learning platforms), the depth of engagement (concerning the effectiveness of video instruction in which the learner may not be observed by the teacher), and the efficacy of remote learning in preserving the nuanced, embodied knowledge that has traditionally been passed down through direct physical and verbal instruction.

2. Theoretical Framework

The long-term objective of this research is to expand the scope of inquiry by incorporating insights from practitioners across various Indian classical dance styles, as well as from dancers at different stages of their training, ranging in age, experience, and exposure to both traditional and digital modes of learning. However, at this preliminary stage, the research is based on a limited set of responses, owing to constraints on active engagement despite a strong personal interest in the subject. While the current dataset provides an initial framework for understanding the impact of digitalization on classical dance mentorship, future research will aim to broaden the participant pool, ensuring a more comprehensive analysis of the evolving pedagogical landscape.

By integrating qualitative research methods – including interviews with dancers, teachers, and choreographers – alongside personal observations, this study contributes to the broader discourse on traditional versus digital learning models in classical dance. It seeks to critically assess whether digital platforms can successfully replicate the immersive learning experience of the *guru-shishya parampara*, and if not, what potential hybrid methodologies could be developed to balance tradition with innovation in the contemporary dance education framework.

This paper does not aim to explore how gurus affect the student's learning experience in terms of guidance, motivation, discipline, attitude, or general classroom atmosphere (Marathe & Wagani, 2022), although some topics inevitably touch on the importance of the mentor.

Due to geographical constraints, I was unable to interview the majority of the respondents in person; consequently, I developed a questionnaire. The survey focused on the following key area of inquiry: participants' experience in the field; geographical

background; mentorship in traditional settings; digitalization in dance; the impact of digitalization on mentorship dynamics; accessibility and depth; the preservation of tradition; perspectives on the future; overall experiences and feedback. To collect data for this research, I reached out to numerous dancers through online forums, requesting their participation in completing the attached questionnaire. However, as is often the case with such outreach methods, response rates in such cases tend to be quite low. I also shared the survey with dancers active within Europe, most of whom are not of Indian origin, but participation among them was similarly low. The most effective approach proved to be direct, personal outreach, particularly when the respondents had specific interests related to the research topic. This may be due in part to the face that the legitimacy of digital platforms and online learning methods remains somewhat peripheral to the perspectives of those involved in South-East Asian traditional dance practices.

In November 2024, Rahul Acharya, the master of one of my colleagues who is engaged in Odissi dance, Virág Réka Túri, visited Budapest, which provided me the opportunity to conduct a face-to-face interview with him. During the interview, I posed the same questions that were included in the survey. The insights gained from this personal interview indicated that the current number of questions might be better suited for inclusion in a subsequent, more comprehensive study. Furthermore, from a research standpoint, it would be advantageous to engage a broader range of dancers at various stages of their careers. This is based on the presumption that the younger generation is more receptive to digital learning platforms, even if such methods may be less effective or authentic compared to traditional approaches.

Apart from this qualitative approach, I also conducted observational research on various digital learning platforms, including *Udemy*, *Skillshare*, and *Coursera*, as well as educational content hosted on the websites of relevant organizations.

3. Analysis

3.1 A scope of digital opportunities

Online platforms such as *Udemy*, *Skillshare*, and *Coursera* allow virtually anyone to upload courses, enabling individuals to teach traditional dance styles that have historically been transmitted exclusively by expert masters through years of dedicated practice. While it is evident that these platforms do not provide the depth of knowledge required to fully master such styles, they serve as accessible entry points that can spark interest and create a demand for deeper engagement. Courses on

these platforms typically consist of short video segments demonstrating fundamental movements of a given style, and, in some cases, a brief choreography. A significant drawback, however, is the limited opportunity for personalized feedback. Instructors are not necessarily available to monitor students' progress or assess their performance.

It is important to note, however, that there are initiatives such as *Natyasutra* (*Online Classes | NatyaSutra Online, Learn Indian Dance and Music*, n.d.), which collaborates with South-East Asian dance artists and masters to offer instruction in six of the eight classical Indian dance forms. Unlike the previously mentioned platforms, courses on *Natyasutra* are offered at a significantly higher price point. While the lessons are still structured as shorter video segments, their total duration far exceeds that of the user-generated content found on open-access platforms. The videos simulate an online mentor-student dynamic for the viewers, featuring not only the guru but also the student, making the classes easier to follow through a mirroring method. A distinctive feature of this initiative is its approach to monitoring student progress: although the accompanying music for a given choreography is available for download, it can only be accessed 30 days after purchase. This delay encourages learners to engage more deeply with the instructional videos and to practice alongside the teacher rather than rushing through the material. Each course is supplemented with detailed descriptions that contextualize the content and the dance style, as well as references to the contributing artists, such as composers.

Another noteworthy initiative is Rukmini Vijayakumar's *Raadha Kalpa Method* (*The Raadha Kalpa Method*, n.d.), a specialized *Bharatanatyam* training system that provides a comprehensive understanding of both technique and dance theory. The program operates on a monthly or annual subscription model and offers close mentorship for participants. According to the manifesto on the program's website:

> The Raadha Kalpa method is a systematic educational program devised by Rukmini Vijayakumar. It is a researched pedagogical structure that enables the priming of a Bharatanatyam dancer with attention to physical, technical, creative, rhythmic, theoretical and artistic detailing. The program will help you progress in your Bharatanatyam. You will see visible changes to your dancing. Your stamina, physical alignment, strength, and understanding of theory in Bharatanatyam will grow if you are disciplined in following the program. You will also gain depth and understanding in the material and structure of Bharatanatyam choreography. There will be videos published every month to ensure the progress of the serious student.

While detailed course information is only available after subscribing, the instructor explicitly states across multiple platforms that the program is designed to provide a tailored learning experience for dancers at all levels, from beginners to advanced practitioners.

3.2 Analysing the received answers

During the questionnaire and personal interview process, insights were gathered from one respondent from Hungary, two from India, and two from the United States. Among them, two participants reported having 5–10 years of dance experience (identifying themselves as students, with one also describing themselves as an independent practitioner). One respondent had 15–20 years of experience and identified themselves as a student, independent practitioner, and teacher. The remaining two respondents had between 30 to 40 years of experience and were considered masters based on their years of experience and the number of students they mentor. However, Mr. Rahul Acharya does not position himself as such, stating that knowledge is an ocean where one cannot be a master. Four of the respondents specialize in Odissi dance, while one practices Bharatanatyam; however, among the Odissi dancers, one also trains in Bharatanatyam. Thematic analysis was used to analyse the survey responses (Braun & Clarke, 2006), while the in-person interview was structured using discourse analysis (Gee, 2014).

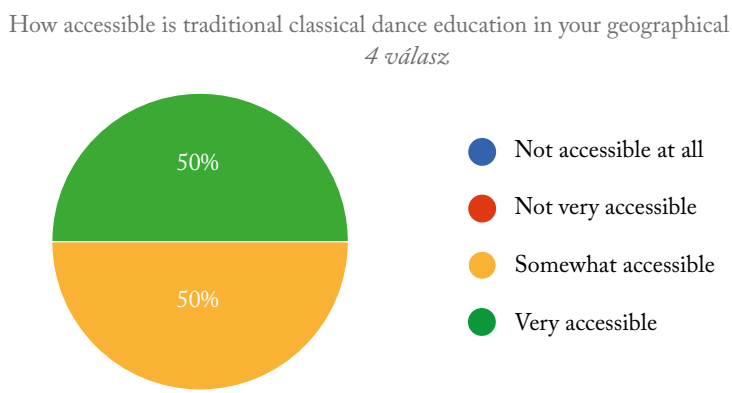
The respondents predominantly reside in large urban centres, ranging from metropolises with over one million inhabitants to megacities exceeding ten million. Most are active within their region and do not frequently travel for tours or distant performances. Notably, while the American respondents generally do not need to leave the United States to pursue training—largely due to the presence of an extensive diaspora—the Hungarian respondent studies in both Hungary and India. The practitioners who live in India received their training locally.

Two respondents indicated that they do not collaborate with artists from other countries. One of the American respondents works with individuals from India, while one of the gurus teaches in both the US and Canada. The other guru has students in the US, in Singapore, in Japan, and in Hungary.

According to the American dancers, the local diasporic communities provide sufficient insight to pursue classical dance forms representing their own culture. In contrast, in Hungary there is a general lack of knowledge about classical Indian dance forms, something the dancer must take into account while teaching and performing there. Rahul Acharya emphasized the importance of being connected to the cultural

roots that define Odissi dance, citing the community as a source of motivation. Quoting from the *Natyashastra*, he references the concepts of *vritti* and *pravritti* – terms that denote local variations of the same style. According to this perspective, the location of a dance community influences the original style. *When you're talking about pravrittis, these are basically regional varieties. So the practices of the region influence the style. You observe, you formulate, and you codify your techniques upon observing daily life. And also, when you say this is a temple dance form, it's not only technique. You have to understand the philosophy, the context, the perspective, the ambiance, the bhava, and the importance of surrender. You have to understand the religious life. These are temple dance forms. Spiritual, agreed, but they are religious in nature. They are straight out of the temple. And I emphasize on this word because there's this whole new woke generation that has come out in the United States, basically uprooting Odissi out of its context* – says Acharya.

Figure 1
Accessibility of traditional classical dance education



Although the respondents do not necessarily maintain direct connections with artists living and working in other regions, they unanimously agree that digitalization has expanded cross-regional and transcontinental learning opportunities. At the same time, they also concur that geographical distance from a master negatively impacts their practice. *Figure 1* illustrates the respondents' perceptions of access to classical dance education based on their location. While respondents in India report that traditional training is possible, responses from the United States were mixed (one indicating high accessibility, while the other suggested the existence of a gap). In Hungary, such dance education is only somewhat accessible.

One respondent described their personal training and learning process with their master as follows: *It's a challenging relationship that pushes me to improve my dance skills. I have to have other aspects of my life together so I can fully focus on dance.* The reflection highlights an aspect of traditional mentorship that cannot be compared to that of pre-recorded classes: personal connection and the motivational role of the teacher.

It is worth highlighting how each respondent answered the following question: *What are the most important aspects of the guru-shishya relationship in your opinion?*

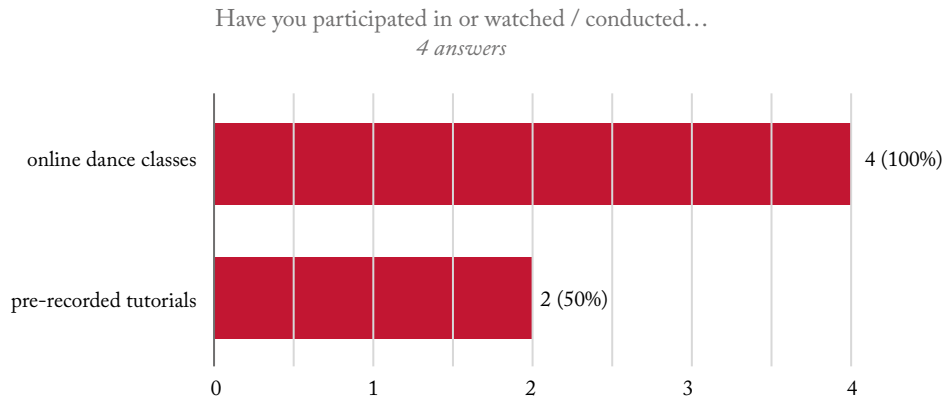
- *The trust, the transference of in-person energy.*
- *Dedication, sincerity, commitment, humility, perseverance, being ready for anything, diligence.*
- *Being part of a lineage that connects teacher to student to teacher back through time.*
- *Comfortability, trust, and patience from the guru as an adult learner in a way that is supportive, encouraging, and yet rigorous.*

It feels safe to be under the watchful eyes of the guru because we've been part of that guru-shishya parampara. The guru, the guru's presence is a motivation, is an inspiration. Even after so many years of dancing, even after spending almost four decades of dancing, every time I visit my guru's house, there's a surge of energy in me. The guru smiles at you when you're touching his feet. You know that itself makes you feel so profound that you are protected. And as long as you receive your guru's support, you know that even if you do not have the privilege of going to him for everyday class, you're on the right track. There's an emotional connection we establish. He's more than a parent, he's more than a father figure to us. There is some amount of respect which is getting lost – recalls Rahul Acharya in describing his experience with his guru. His response underscores an opinion that is echoed by other participants: without establishing a personal connection, online classes fall short. In such cases, dance classes *become more transactional than transformational.*

In the responses, one participant draws a direct link between dance technique and culture, while another suggests that in-person mentorship is crucial not only in the traditional South-East Asian dance forms but for all types of learning.

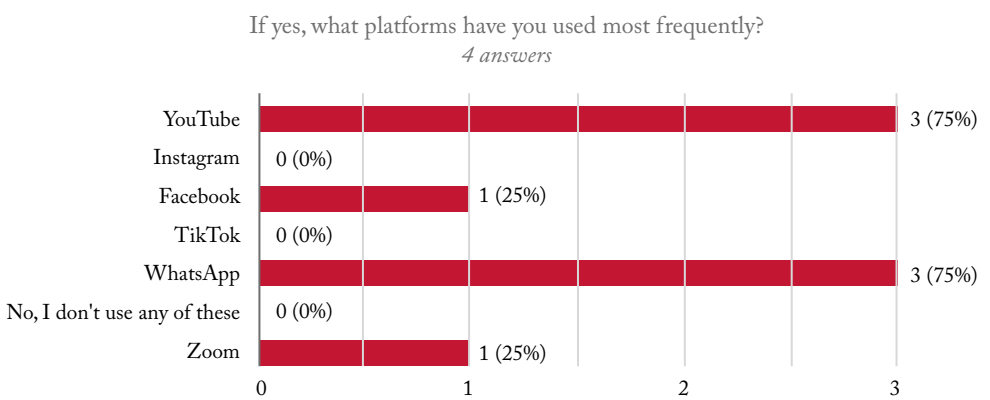
Figure 2 illustrates that although all respondents place high value on in-person learning and mentorship, each of them (based on their questionnaire responses) has participated in some form of online education.

Figure 2
Respondents' participation in online education



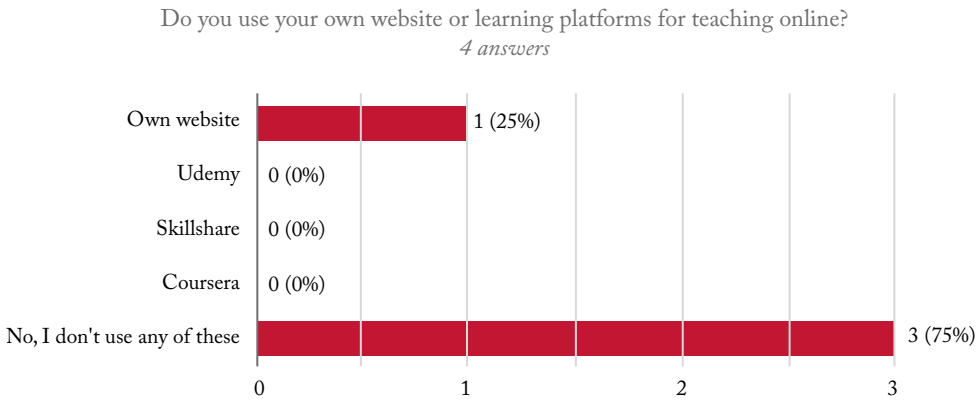
The data also reveals that nearly all respondents utilize at least one social media application with audio and video capabilities for dance-related purposes. The frequent mention of YouTube among these platforms suggests that the participants engage not only in dance activities and classes that require the interaction of at least two people, but also pre-recorded videos. The presence of the platform Zoom in the responses likely results from its capacity for individualized input (*Figure 3*).

Figure 3
Accessibility of traditional classical dance education



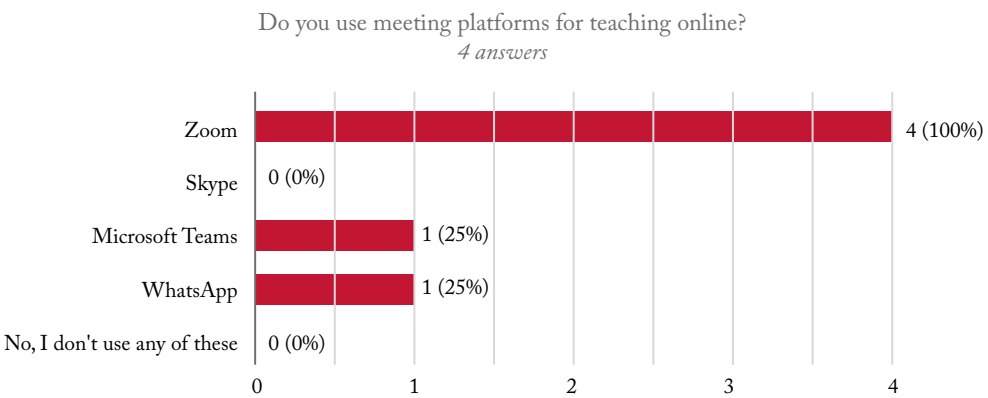
However, none of the respondents reported using the previously-mentioned educational platforms (*Figure 4*).

Figure 4
Usage of online educational platforms



Among applications specifically designed for virtual meetings, *Zoom* stands out as the most widely used, followed by *WhatsApp*—originally developed for mobile devices but now accessible on laptops and PCs—and Microsoft Teams (*Figure 5*).

Figure 5
Usage of online meeting platforms



The most significant distinction between digital and in-person learning, according to the respondents, is that online instruction *is a good option for more classes and as a supplement to initial in-person learning after the basics of the style have been acquired.* The participants suggest a hybrid approach that applies both of these modalities: using video sessions to revise material, record choreographies, or supplementing in-person classes when in-person participation is not possible. Apart from these options, they also suggest that theoretical classes could be effectively delivered via online formats.

One respondent noted that *Internet connection sometimes slow with music. Sometimes need in person input on certain steps and movements or abhinaya explanation. These can be hard to understand over a remote environment. The teacher and student have to communicate well. It might take longer to understand something online vs in person.* This input reflects the broader limitations of online learning, while other answers also highlight technical difficulties, connection problems, and challenges in following music. They conclude that digital learning can render the teaching of dance more transactional then transformational, largely due to the absence of real personal connection and the difficulty of forming emotional bonds.

Some answers support the notion above that online learning can either spark interest or become truly useful once the student has acquired sufficient knowledge in the artform to meaningfully engage with feedback delivered via a digital platform. Accessibility can come at a great cost, though the respondents do not reject the use of technology outright. One participant in particular emphasized the importance of preserving and showcasing dance on forums such as *YouTube*.

4. Conclusion

These findings contribute to broader discussions on the sustainability of traditional mentorship models in contemporary dance education and the potential for hybrid pedagogical approaches that integrate both in-person and virtual learning methodologies. The collected responses agreed with the hypothesis: while most of the participants recognize the benefits of digital learning, they also agree that in-person connection with a guru remains invaluable and cannot be erased just yet from the learning process of classical South-East Asian dance forms. Although the Internet has enabled global connectivity, participants emphasized that dance is linked to the body and often practiced within local communities. Those who connect with people from other regions, countries, or continents use digital tools to supplement in-person interaction but express a preference for touring and teaching in-person.

Future research could focus on the artists contributing to the above-mentioned online platforms. As previously noted, conducting additional interviews with dancers of different styles and varying levels of experience would also prove beneficial.

References

Anastasiades, P. (2014). *Research on DL with the use of ICT (e-learning) in the Greek typical educational system. Review and prospects for primary, secondary, and higher education.* Open Education-The Journal for Open and Distance Education and Educational Technology, *10*(1), 5-32.

Braun, V. and Clarke, V. (2006). *Using thematic analysis in psychology.* Qualitative Research in Psychology, *3*(2). pp. 77-101.

Chan, J. C. P. - H. Leung - J. K. T. Tang - T. Komura. (2011). *A Virtual Reality Dance Training System Using Motion Capture Technology*. IEEE Transactions on Learning Technologies *4*(2): 187–195.
doi:10.1109/TLT.2010.27

Cheng, Yin Cheong; Kwok Tung Tsui; King Wai Chow; Magdalena Mo Ching Mok, eds. (2002). Subject Teaching and Teacher Education in the New Century: Research and Innovation, 194.

Cisneros, REK, Stamp, K, Whatley, S & Wood, K (2019), *WhoLoDancE: digital tools and the*
Dance learning environment, Research in Dance Education, *20*(1), 54–2. https://doi.org/10.1080/14647893.2019.1566305

Gee, James Paul (2014). *An Introduction to Discourse Analysis: Theory and Method*. Routledge, New York.

Giosos, I., Mavroides, I., & Koutsouba, M (2008). *Research on distance learning: Review and Prospects.* Open Education-The Journal for Open and Distance Education and Educational Technology, *4*(1), 49-60.

Koutsouba, Maria (2016). *Learning and Digital Environment of Dance – The Case of Greek Traditional Dance in YouTube,* European Journal of Open, Distance and e-Learning, *19*(2), 80–95.
DOI: 10.1515/eurodl-2016-0009

Lionarakis, A. (2001). *Open and distance polymorphic education. Considerations for a qualitative approach of teaching material planning*. In A. Lionarakis (ed.), Thoughts and Considerations for Open and Distance Education (pp. 33-52). Athens: Propobos.

Lionarakis, A. (2006). *The theory of distance education and the complexity of its polymorphic dimension*. In A. Lionarakis (ed.), Open and Distance Learning. Theory and Practice (pp. 33-52). Athens: Propobos.

Marathe, Aishwarya – Wagani, Rekha (2022). Role of Guru in the Sustenance of Passion Towards Classical Dance: A Qualitative Enquiry. ShodhKosh: Journal of Visual and Performing Arts July-December 2022 *3*(2), 326–340.

Mohanty, A. - Vaishnavi, P. - Jana, P. - Majumdar, A. - Ahmed, A. - Goswami, T. - R. Sahay, R. (2016). *Nrityabodha: Towards understanding Indian classical dance using a deep learning approach*, Accepted manuscript https://www.academia.edu/95055790/Nrityabodha_Towards_understanding_Indian_classical_dance_using_a_deep_learning_approach

Online classes | NatyaSutra Online, Learn Indian Dance and Music. (n.d.). Natyasutraonline. Retrieved February 14, 2025, from https://www.natyasutraonline.com/

The Raadha Kalpa method. (n.d.). The Raadha Kalpa Method. https://www.theraadhakalpamethod.com/

Rama Devi, P. (2023). *The Evolution of Indian Classical Dance Traditions*. Padinjyarayil Publication.

Vergidis, D., Lionarakis, A., Lykourgiotis, A., Makrakis, B., & Matralis, Ch. (1998*). Open and distance learning*, vol. 1. Patra: Institution and Operation, Hellenic Open University.

WORKSHOP

STEPHANIE FELBER
choreographer and videographer
www.stephanie-felber.de

BRIDGING BODIES: EXPLORING DIGITAL-PHYSICAL DOUBLING IN PERFORMANCE

Keywords: digital doubling, dance and video art, embodiment, choreographic methods, live-cinema

Abstract

This study examines the phenomenon of digital-physical doubling in performance art, focusing on how the interplay between physical and virtual selves reshapes concepts of authenticity, embodiment, and spatial awareness. Using dance, video art, and Isadora software by Troikatronix, the research explores the dynamic relationship between performers and their digital counterparts. In an interactive workshop held during the 1st International Conference on Dance and Digitalization, participants engaged with their digital doubles as mirrors, co-creators, and provocateurs. These interactions raised essential questions about identity, relational dynamics, and the evolution of choreographic practices. Key inquiries included: How do dancers navigate relationships with their digital counterparts? How can training approaches support simultaneous analogue and digital embodiment? How does the coexistence of physical and virtual selves challenge traditional choreography? By framing the digital double as an active collaborator rather than a mere reflection, this research offers interdisciplinary insights into performance art and establishes a foundation for innovative collaborations across art, technology, and psychology.

1. Introduction

The rapid evolution of digital technologies has profoundly influenced performance art, reshaping traditional concepts of embodiment, identity, and authenticity. As physical and virtual realities increasingly converge, choreographers and performers encounter new opportunities to integrate these domains into cohesive artistic practices.

Digital-physical doubling, where digital projections of performers act as creative agents in choreographic contexts, offers a transformative perspective. Rather than being seen as supplementary or adversarial, digital doubles can be understood as integral extensions of the performer. These counterparts serve as catalysts for rethinking presence and agency in performance, challenging conventional paradigms of choreographic practice.

Through the use of Isadora software by Troikatronix, the Bridging Bodies workshop facilitated real-time interactions between dancers and their digital doubles. These hybrid performance spaces combined analogue and digital elements, enabling participants to engage in exercises exploring the coexistence of physical and virtual selves. This process led to the discovery of new movement vocabularies and expanded notions of spatial dynamics.

The research was guided by the following key questions:

- How does the presence of a digital double influence a performer's sense of authenticity and identity?
- What dynamics emerge when dancers interact with digital counterparts during live performance?
- How can training methodologies integrate analogue and digital embodiment?
- How does the interplay between physical and virtual selves redefine choreography?

2. Theories of Duality And Presence

This research draws upon several theoretical perspectives to explore the interplay between physical performers and their digital doubles. By integrating concepts from Japanese philosophy, psychoanalysis, and postmodern theory, the study provides a multifaceted lens to examine the role of digital doubles in reshaping choreography, authenticity, and identity.

2.1 Coexistence

The Japanese concept of Bunshin (分身), meaning "division of the body," offers a powerful framework for understanding digital doubles as harmonious extensions of the performer. Unlike Western paradigms that often depict duality as oppositional or conflict-driven, Bunshin embraces coexistence and collaboration between multiple selves. This perspective redefines traditional notions of presence, enabling performers

to treat their digital projections as integral components of their artistic expression rather than as separate or competing entities.

As Posadas (2014) highlights in *Double Visions, Double Fictions: The Doppelgänger in Japanese Film and Literature*, Japanese cultural narratives often interpret doubling as an opportunity for introspection and transformation. In this view, doubling fosters growth and expanded self-expression, which aligns with the principles of Bunshin. Furthermore, Posadas emphasises how doubling serves as a creative device for navigating fragmented identities and crafting multi-layered narratives. In choreography, Bunshin enables performers to embody multiple identities simultaneously, using this multiplicity as both a tool for artistic exploration and a plot device that introduces depth and complexity to performance.

A unique strength of Bunshin lies in cultivating dual awareness—a heightened state where performers simultaneously engage with their physical selves and digital counterparts. This awareness challenges traditional choreographic paradigms by encouraging performers to create movement dialogues that embrace hybridity, synchronicity, and contrast. The digital double becomes a creative partner rather than a passive reflection, reshaping the performer's presence and agency within the choreographic process.

Moreover, Bunshin transforms the choreographic landscape by enabling performers to explore hybrid performance spaces that transcend the limitations of purely physical embodiment. By blurring the boundaries between their physical and digital selves, performers are invited to craft intricate spatial interactions and narratives that explore expanded dimensions of movement, presence, and relationality. Through the embodiment of multiple identities, Bunshin also allows performers to delve into nuanced storytelling, where the interplay of selves becomes a metaphor for broader themes of identity, coexistence, and transformation. This perspective positions Bunshin as both a philosophical foundation and a transformative tool for advancing creativity in contemporary choreography.

2.2 Disruptions of Familiarity

Freud's theory of the *unheimlich* (uncanny) captures the psychological tension inherent in encountering a double—an entity that is both familiar and strange. Digital doubles exemplify this tension, presenting performers with an uncanny version of themselves that appears autonomous yet inextricably connected.

Derrida's notion of *trace* provides a philosophical lens for understanding this dynamic. For Derrida, the trace represents a mark of absence within presence—an

indication that something is both there and not there, shaping meaning through what is missing as much as through what is present. In the context of digital doubles, the performer's identity becomes fragmented and layered, marked by the simultaneous presence of the physical self and its digital projection. The digital double, as a trace, destabilises the notion of a fixed, singular identity, revealing instead an interplay between absence and presence, self and other. This fragmentation invites performers to navigate fluid boundaries, engaging with their doubles as extensions, distortions, and reflections of their own being.

In a choreographic setting, this interplay between familiarity and fragmentation creates fertile ground for exploration. Digital doubles act as mirrors that reflect and distort the performer's movements, inviting a dialogue between intention and improvisation. For example, dancers working with delayed or exaggerated projections must adapt to asynchronous rhythms, challenging their habitual patterns and fostering creative innovation. The trace of the physical self within the digital projection unsettles the performer's control, transforming the double into a source of inspiration and experimentation, highlighting its role as both disruptor and collaborator.

Recent scholarship, such as Soliman's (2024) exploration of the doppelgänger in literature, visual culture, and new media, expands the understanding of alterity in contemporary contexts. Soliman argues that the doppelgänger operates as a site of negotiation between self and other, reflecting broader cultural anxieties and aspirations about identity and authenticity in the digital age. This perspective resonates with the uncanny nature of digital doubles in performance, which simultaneously affirm and destabilise the performer's presence. By framing the digital double as an embodiment of alterity, performers and audiences are prompted to confront questions of agency, autonomy, and relationality in hybrid spaces.

Furthermore, the uncanny nature of digital doubles subverts traditional hierarchies in performance. While conventional choreography often centres the physical performer, digital doubling positions the digital entity as an equal participant. This shift provokes reflection on authorship, agency, and the distribution of presence within hybrid performances, ultimately redefining the boundaries of control and collaboration. In this sense, Derrida's trace offers a framework for reconceptualising the performer's identity as something dynamic and multi-layered, shaped by the interaction between physical and digital presences.

2.3 Hyperreality and Creative Agency

Baudrillard's theory of simulacra challenges the binary between reality and imitation, positing that digital representations exist as realities in their own right. As Baudrillard (1983) elaborates in *Simulations*, the simulated does not merely copy reality but produces a hyperreality, wherein the boundaries between the original and the representation dissolve. This concept underscores the transformative potential of digital doubles in performance, which not only reflect but actively shape and expand the performer's presence and creative expression.

This framework is particularly relevant to the context of the *Bridging Bodies* workshop, where participants discovered that their digital doubles were not merely reflections but active agents capable of introducing new creative layers. The hyperreal nature of these digital counterparts blurred the distinctions between physical presence and virtual projection, emphasising their role as co-creators rather than passive imitations.

This redefinition of authenticity has significant implications for choreography. Traditional dance often prioritises the physical body as the locus of genuine expression. However, the inclusion of digital doubles reframes authenticity as a relational and dynamic construct that emerges from the interplay between physical and digital selves. For instance, dancers performing alongside manipulated projections—such as fragmented or delayed versions of their movements—must engage in real-time dialogue with their digital counterparts. This iterative process positions the digital double as a co-creator, augmenting the performer's presence and enabling choreographic expressions that transcend the analogue medium.

The spatial implications are equally transformative. Digital doubles extend the performer's influence into virtual dimensions, creating hybrid stages where physical and digital spaces coexist. As Baudrillard suggests, simulations introduce new layers of meaning and interaction, transforming the stage into a hyperreal space where tangible and intangible realities merge. This expanded spatial dynamic introduces opportunities for layering, synchronicity, and interaction, challenging performers to navigate both tangible and intangible elements of their embodiment.

2.4 Hybrid Performance and Transformation

The integration of digital technologies redefines the practice of stagecraft, aligning with Dixon's (2007) exploration of digital performance as a multidimensional

phenomenon. Schechner's (1988) performance theory further supports this view, framing performance as a space for experimentation with alternative identities and modalities.

In the context of this research, digital technologies—particularly Isadora software—enabled real-time manipulation of performers' movements, creating hybrid environments where physical and digital selves interacted dynamically. These frameworks informed the workshop's choreographic methods, encouraging performers to experiment with identity, presence, and spatial relationships in ways that are only possible in digital-physical hybrid settings.

3. Engaging the Digital Double: Methods and Reflections

The Bridging Bodies workshop translated theoretical frameworks into practice, enabling participants to navigate the intersection of physical and virtual realms. By designing exercises that reflected Bunshin, the unheimlich, and hyperreality, the workshop explored hybrid performance as a space for rethinking identity, movement, and presence (*Figure 1*).

Figure 1
Coexistence and Dual Awareness, reflecting the Japanese concept of Bunshin (分身), meaning "division of the body"

3.1 Theoretical Principles in Action

The workshop's design was rooted in key theoretical concepts, each guiding its structure and focus:

- Coexistence and Dual Awareness: Bunshin-inspired exercises encouraged performers to engage simultaneously with their physical presence and digital doubles, fostering a sense of harmony and collaboration between analogue and virtual selves (*Figure 1*).
- Embracing Fragmentation: Inspired by Freud's unheimlich, manipulations such as delays and distortions introduced tension and unfamiliarity, enabling participants to explore disassemblies as a source of creative expression (*Figure 2*).
- Hyperreal Dynamics: Baudrillard's concept of simulacra reframed digital doubles as independent agents capable of reshaping choreographic intent, expanding participants' movement vocabulary beyond physical constraints (*Figure 3*).
- Hybrid Environments: Informed by Schechner and Dixon, the workshop positioned the hybrid stage as a transformative space where performers could experiment with fluid boundaries between physical and virtual dimensions.

3.2 Digital Manipulations

The workshop utilised Isadora software to create real-time digital projections, transforming the stage into a dynamic and interactive environment. It also enabled the real-time manipulation of participants' movements, including:

- Fragmentation: Abstracted projections disrupted performers' sense of continuity, enabling introspection and the exploration of layered identities.
- Temporal Shifts: Delayed echoes of movements introduced asynchronous rhythms, encouraging performers to engage with dual timelines and heightened spatial awareness.
- Exaggeration: Amplified gestures transformed the digital doubles into hyperreal entities, challenging participants to reimagine their relational dynamics and scale of movement.

Figure 2
Fractured Presence, reflecting the idea of fragmentation and Freud's unheimlich

3.3 Choreographic Experiments

Participants applied these manipulations through exercises designed to expand their creative possibilities:

- Mirror Work: Activities involving synchronisation and intentional divergence explored relational dynamics and the duality of presence between performers and their digital doubles.
- Navigating Distortion: Emotional and psychological responses to temporal dissonance and fragmentation were channelled into improvisation, allowing performers to transform unease into abstract or narrative movement.
- Shared Authorship: Scenarios where digital doubles led sequences invited participants to reimagine roles of agency and co-creation, treating their counterparts as active contributors to the choreography.

3.4 Emotional and Spatial Reflections

The hybrid stage fostered new emotional and spatial relationships, enriching the participants' performative experience:

- Emotional Range: The interplay between familiarity and estrangement evoked by the digital doubles ranged from moments of creative liberation to discomfort, offering opportunities for introspection.
- Spatial Innovation: The layered stage—merging physical and virtual elements—challenged participants to navigate expanded spatial dimensions, blending tangible presence with virtual abstraction.

Figure 3
Simulated Agency, reflecting Baudrillard's simulacra, where digital doubles act as autonomous agents

3.5 Live Cinema Integration

Live Cinema techniques positioned digital doubles as narrative and choreographic partners, merging storytelling with real-time performance:

- Reimagined Temporality: Effects such as looping and temporal distortion disrupted linear movement, allowing performers to experiment with asynchronous rhythms and fragmented narratives.
- Narrative Hybridity: Digital doubles acted as choreographic and narrative partners, transforming the stage into a multidimensional space that merged live performance with cinematic storytelling.

4. The Intersection of Identity, Authenticity and Choreography

The Bridging Bodies workshop revealed significant insights into the transformative potential of digital doubling, particularly its implications for movement, identity, and hybrid performance spaces. These findings contribute to ongoing conversations in performance studies, offering both theoretical and practical perspectives on the interplay between physical performers and their digital counterparts.

The interaction with digital doubles encouraged performers to expand their movement vocabularies, supporting Baudrillard's (1983) theory that simulacra create realities that exist independently of their origin. The digital projections acted not as passive reflections but as co-creators, inspiring improvisation and reshaping performers' habitual patterns. This aligns with Dixon's (2007) characterisation of digital performance as a fertile space for emergent creativity, where technology collaborates dynamically with the performer.

Manipulations such as temporal dissonances and distortions highlighted Bunshin principles of duality, enabling performers to navigate a heightened sense of coexistence between their physical and digital selves. This relational interplay enriched choreographic practices by reframing digital tools as active participants in the creative process. Tools such as Isadora software demonstrated the potential to cultivate adaptability and responsiveness, suggesting their integration into dance training to support the development of hybrid movement vocabularies.

The hybrid performance environment disrupted traditional notions of stagecraft, emphasising the liminal spaces described by Derrida's (1978) concept of trace, where the digital double exists simultaneously as presence and absence. Participants noted that their digital doubles extended their influence into virtual dimensions, creating multilayered stages where tangible and intangible elements interacted dynamically.

This expanded spatial dynamic aligns with Schechner's (1988) view of the stage as a transformative space for experimentation with identity and presence. By intertwining physical and virtual realms, hybrid performance spaces blur distinctions between performer, projection, and audience, fostering choreographic possibilities that transcend conventional stagecraft.

Participants' emotional responses highlighted the psychological complexity of engaging with digital doubles. For some, these doubles amplified creative potential, offering a sense of liberation and extending Merleau-Ponty's (1945) notion of embodied subjectivity, where the body serves as a medium for both perception and expression. Others reported discomfort, aligning with Freud's concept of the unheimlich, as the digital doubles evoked an uncanny duality that challenged their

sense of control and identity. This dual experience underscores the transformative potential of tension within hybrid performances, inviting further exploration of digital doubling's role in creative contexts.

The live cinema approach, facilitated by Isadora software, merged choreography with cinematic storytelling, allowing performers to explore new layers of visual and temporal complexity. Effects such as looping, fragmentation, and exaggeration reshaped traditional performance structures, positioning live cinema as a tool for innovation. These findings align with Dixon's (2007) assertion that digital performance fosters multidimensional experiences, transforming the relationship between performers, audiences, and the stage. By integrating cinematic techniques into live performance, the workshop demonstrated how hybrid environments reimagine choreographic intent and execution. These tools not only expanded the performers' creative boundaries but also challenged audiences to engage with multilayered narratives that traverse physical and digital dimensions.

5. Towards a Fusion of Stage and Screen

Digital-physical doubling in performance art offers a transformative framework for reimagining authenticity, identity, and choreography. The Bridging Bodies workshop demonstrated how performers can engage with the interplay between physical and digital realms, fostering innovative movement vocabularies, exploring psychological complexity, and challenging conventional notions of presence and authorship.

Hybrid performance spaces blur the boundaries between the real and the virtual, inviting performers to explore fragmented temporalities, layered spatial dynamics, and complex relational interactions. By treating digital doubles as co-creators, these environments encourage performers to craft innovative choreographic practices while engaging audiences in multidimensional narratives that intertwine physical and digital dimensions.

Digital doubling extends beyond technological novelty, offering a transformative perspective on the intersection of physical and virtual realities. By positioning the digital double as an active collaborator rather than a mere replica, this approach broadens the artistic, psychological, and philosophical horizons of performance art. Hybrid spaces cultivate dual awareness, enabling performers and audiences alike to reconsider traditional ideas of presence, authenticity, and agency.

As performance art evolves alongside technological advancements, insights from hybrid performance spaces open new possibilities for interdisciplinary

collaborations across art, technology, and psychology. Embracing the interplay between physical and digital selves paves the way for creative explorations that redefine the boundaries of connection in the digital age.

References

Baudrillard, J. (1983). *Simulacra and simulation*. University of Michigan Press.

Baudrillard, J. (1983). *Simulations*. Semiotext(e).

Dixon, S. (2007). *Digital performance: A history of new media in theater, dance, performance art, and installation*. MIT Press.

Derrida, J. (1978). *Writing and difference*. (A. Bass, Trans.). University of Chicago Press.

Freud, S. (1919). The uncanny. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 17, pp. 217–256). Hogarth Press.

Manovich, L. (2001). *The language of new media*. MIT Press.

Merleau-Ponty, M. (1945). *Phenomenology of perception*. (C. Smith, Trans.). Routledge.

Nogueira, J., et al. (2024). Machine learning and creativity in dance: A systematic review. *Journal of Creative Technologies*, 12(3), 45–62.

Posadas, B. T. (2014). *Double visions, double fictions: The Doppelgänger in Japanese film and literature*. University of Minnesota Press.

Schechner, R. (1988). *Performance theory*. Routledge.

Soliman, A. (2024). *The «Doppelgänger» in our time: Visions of alterity in literature, visual culture, and new media*. De Gruyter.

McGregor, W., & Google Arts & Culture. (2019). *Art and AI: The intersection of dance and technology* [Video]. Google Arts & Culture.

Troikatronix. (2024). *Isadora: Interactive media playback and performance software*. Retrieved from https://troikatronix.com.

Images: ©Stephanie Felber - Performer: Ludger Lamers - Project: Bunshin

DANCE PERFORMANCE

GABRIELLA KÉZÉR
assistant professor
Hungarian Dance University

DIGITAL TECHNOLOGY AND DANCE

Keywords: digital doubling, dance and video art, embodiment, choreographic methods, live-cinema

Abstract
This essay explores the use of digital technology throughout the process of preparing and presenting the closing dance performance at the 1st International Conference on Dance and Digitalization at the Hungarian Dance University on November 29, 2024. Today, digital technology has the potential to transform traditional choreographic methods, offering a variety of possibilities for both dancers and audiences.

1. Introduction

The aim of this movement study was to explore how digital technology can be used as part of a stage performance, taking into account the teaching methods and themes of the Hungarian Dance University. This project was carried out in collaboration with the graduate students of the *Dancer and Coach* (BA) program in the *Commercial Dance Department* at the Hungarian Dance University.

2. Theoretical Framework

The concept of the project was based on the musical performance known as *soundpainting*. To understand the essence of *soundpainting*, we can refer to a study on this topic by Samu Gryllus, entitled *The Practice of multidisciplinary community composition – Soundpainting* (A multidiszciplináris közösségi alkotás gyakorlata – a Soundpainting, Gryllus, 2015), which defines its content and thematic meaning. From the paper we learn that *soundpainting* as a practice has a 40-year history. Cornelius Cardew created a graphic notation for *Treatise* (Figure 1) between 1963 and 1967. The 193-page musical composition eschewed traditional sheet music in favor of a variety of abstract symbols, lines, shapes, and graphic elements interpreted

and translated into sound by the performers. However, practical application and development of *soundpainting* are attributed to musician, composer, and bandleader Walter Thompson. In 1974 he founded his own ensemble in Woodstock, the Walter Thompson Orchestra, consisting of 25 musicians and dancers. In an interview (Minors, 2011), Thompson admitted how the ensemble members thematically improvised based on traditional notation. Instead of speaking loudly to the ensemble while they were playing, Thompson wanted to give hand signals to direct the musicians. He recounted that "a few minutes later, I created a hand signal called 'pointillism', which I tried and it worked brilliantly" (Minors, 2011, 1.c). After the concert, he decided to further develop in this direction. This marked the starting point in the development of a new sign language, representing a means of control and an ever-expanding toolbox of gestures. This system also gave the conductor the opportunity to direct a composition in real time in relation to the "momentary state, situation and decisions of the performers, regardless of the decision they had made or would have made before" (Gryllus, 2015, p. 10). A basic rule of *soundpainting* is that errors do not exist on the part of the performer; if they do not follow the *soundpainter's* signal, it is rather considered a misunderstanding to which the conductor must adapt accordingly. In a typical *soundpainting* performance, the conductor, who is usually facing the performers, uses hand signals to direct the actors involved in the performance, which can include dancers, musicians, actors, or visual artists.

3. The Process of Creation

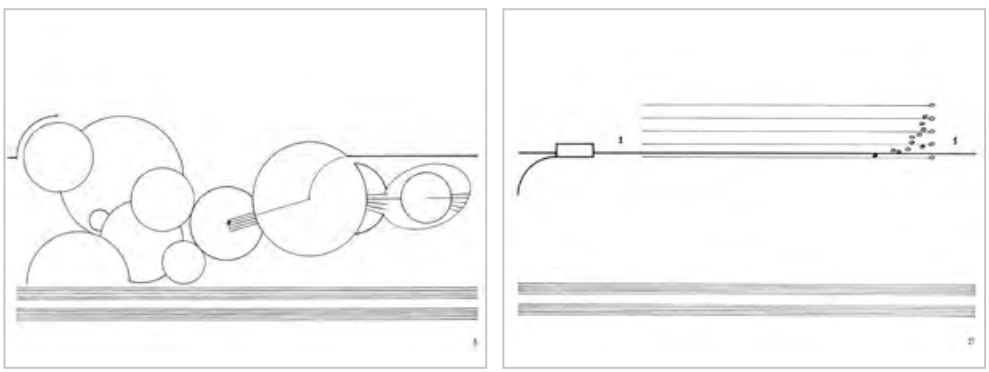
In this performance, digital technology replaced the role of the conductor. I invited creative technologist Gábor Papp to develop the notation that would guide both dancers and musicians. Despite his extensive experience collaborating with dancers as a creative partner in several dance productions, this task was new to him; he had never before been asked to undertake such a project.

The dancers and myself, however, had had earlier experience in *soundpainting*. In the summer of 2024 at the Bethlen Tér Theatre, dance students took part in an improvisational performance featuring live music and the participation of visual artist and painter Viktoria Kovács, founder of the Bakovy Art Gallery (Kézér, 2024). The audience saw a performance, which could be characterized as a total artistic co-production. The artists, dancers, and musicians reacted in real time to artistic impulses, experiencing emotion and meaning and painting it on canvas. Structure was provided by the notational cues, preserving the spontaneity and uniqueness of each moment. During the performance, I conducted using graphic notation

drawn from Cornelius Cardew's *Treatise*, conducting the musicians, dancers, and the painter, who had been informed in advance regarding the interpretation of the gestures. Using the gesture system I had developed, I guided the improvisational process of the individuals on stage.

In the performance at the 1st International Conference on Dance and Digitalization, Gábor Papp projected a series of multi-level notational signs he had created, which structured the constantly changing and evolving flow of the performance for 20 minutes. In my interpretation, this digital dance performance was a conscious development of the previous performance presented at the Bethlen Tér Theatre, and was the result of the project-based pedagogical method outlined in the study published following the Bethlen Tér Theatre performance (Kézér, 2024), which explored the engagement with the challenges and opportunities presented by technological developments of the time.

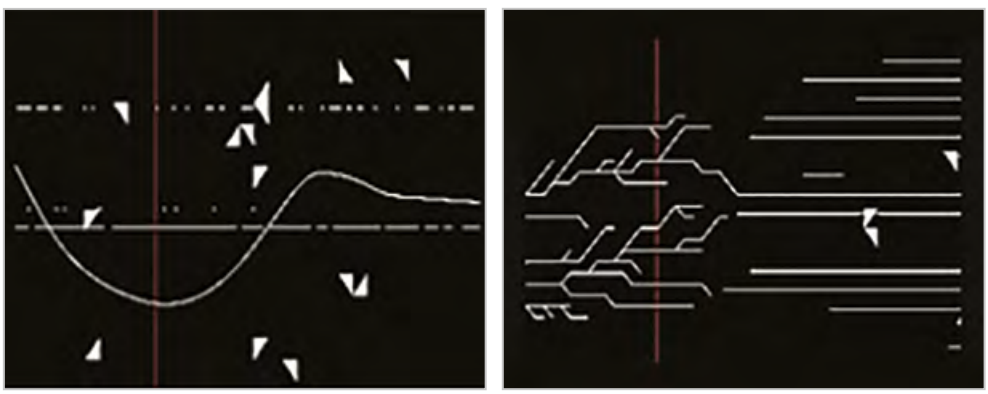
Figure 1
Parts of the graphic notation for Cornelius Cardew's (1967), *Treatise*



Our collaboration functioned as an ongoing brainstorming session. First, I shared Cornelius Cardew's 193-page dictionary of graphic notation with Gábor Papp, which I had received from Samuel Miksa Garami, a contributor to Samu Gryllus' *Soundpainting* program and an active participant in related performances. In response to Papp's question as to whether he should strictly adhere to the notation, I consulted Gryllus, who informed me during a phone conversation that the sign language dictionary can be continuously expanded in line with the purpose that the expansion serves. This granted Papp with a great deal of freedom as in addition to having the complete *Treatise* in pdf form, he was free to conceptualize, design, and edit his own gesture system based on that of Cardew. Prior to finalizing the system, we engaged in numerous email exchanges and discussions, determining the duration of the different

signs, the speed of their progression, and the size of the different superimposed signs. There was substantial discussion about improvisation in music and dance, an area unfamiliar to the creative technologist. To ensure that the dancers and musicians could interpret the signs in real time, Papp designed the digital figures to enter from the right and move to the left. To accommodate to the temporality of the music and dance as well as the movement of the figures, Papp incorporated a static vertical line on the screen which acted as a playhead. This helped to align the music, movements, and animation during the projection.

Figure 2
Examples from Gábor Papp's digital sign system, photographed from a recording of the performance on November 29, 2024



During the week of the performance, I received what appeared to be the final version of the full-length video from Gábor Papp. This gave us the opportunity to view the video in advance with the musicians and dancers and collectively discuss what we wanted to achieve. The aim, conceived in collaboration with the musicians, was to create individual interpretations of the images displayed in the projected video material and explore their impacts on the dancers. In comparison to traditional *soundpainting*, the role of the conductor was replaced by Papp's digital program, which was projected onto the back screen of the stage space. This posed certain challenges, making it somewhat difficult for the dancers to view the signs as they were not receiving them from the front. Instead, they had to read the signs from other angles in order to process, interpret, and react to them. The two musicians, both of whom were graduates from the Liszt Ferenc Academy of Music, faced a similarly complex task, as they drew inspiration from the dancers and the moving notation signs at the same time, all while engaged in improvisation (*Figure 3*). Following the projected

digital score required an immediate response from both musicians and dancers, in which movement and sound were closely linked.

The rehearsal day arrived, and we eagerly awaited the start. At various points, the 20-minute video featured multiple layers of interlocking signals. At the beginning of the rehearsal, the dancers and musicians improvised together without the cues in order to attune to one another. When the anticipated moment arrived, the digital program began, displaying the sequence of signals, while the musicians and dancers continued their improvisation. Following the first complete rehearsal, which was attended by Gábor Papp, we reviewed the recorded video footage of the session. The dancers and musicians were also asked to reflect on what they had seen. While watching the playback, they began to formulate new ideas. The full duration of the digitally programmed video footage was played again, and it became evident that the new ideas from the musicians and dancers were already appearing on stage during the performance, many of which emerged during the break. The dancers went through the entire process one more time before the day of the performance. As during the rehearsal phase, they warmed up with a joint improvisation with the musicians to once again attune to each other.

Figure 3
Excerpt from *Soundpainting with Body*, a performance incorporating digital elements [Photograph] by Pál Csillag (2024)

After repeatedly reviewing the footage of the rehearsal and performance (*Figures 3* and *4*), I found that the final performance appeared much more liberated for both the musicians and the dancers. At the end of the performance, they asked one another if the digital program had been shorter this time, and shared a desire to continue dancing and making music together.

Figure 4
QR code linking to an excerpt from *Soundpainting with Body* at the 1st International Conference on Dance and Digitalization, November 29, 2024

4. Reflecting on the Performance

The performance opened up new dimensions for choreographic practice. The approach enables real-time creation in which movement and music are intricately intertwined. The freedom and responsibility of the dancers are also increased, positioning them as active participants in the artistic process. This communication and flexibility foster skills that are essential to modern dance practice.

By incorporating digital technology into the performance, the dancers were able to explore new movement possibilities and rethink the use of body techniques. They were encouraged to think productively and creatively through musical improvisation, while the continuous flow of digital images provided them with a sense of direction.

The dancers' deeper understanding of their individual movement patterns was also facilitated by the evaluation and analysis of the running cues, the combined visual cues that they received, and the impulses from the live music. Although the performance was improvisational rather than being based on a fixed choreography, there was a overarching guiding principle followed by both the musicians and dancers. This leitmotif was manifested across multiple levels and locations in the projected digital imagery, in its various forms of representation, and in the 3D representation of various geometric shapes and lines.

The principle of "here and now" was central to the creative process during the performance, supported by interactive digital technology and shaped by the performers' movements and relationships, with each other the music, and the digital notation. These interactions structured the performance, providing a framework in which musical and dance events were spontaneously created in real time. The projected digital signs created by Gábor Papp provided an electronically generated improvisational framework that could be understood as an open-ended structure (Figure 5). The dancers, as individuals and performers, created a fluid interplay with the visual strands that made up the dance according to their own interpretations. Their full presence in the moment was evident throughout the performance, resulting in a deeper, more honest form of expression. This individuality, which was also true of the musicians, enabled a more authentic communication with the audience than that typically seen in traditional performances.

5. Conclusion

The symbiosis of technology and artistic creativity is key to shaping the future of dance. In response to this challenge, Gábor Papp embarked on an experiment to develop a new notational sign system capable of supporting improvisation in both music and dance through continuous digital projection. This marks an initial step which can open the door to a variety of new ideas. The performance created a form of collaboration in which traditional roles and hierarchies were transformed, with artists becoming equal partners in the collective improvisation process.

The on-stage visual experience and the interpretation of the dancer's body are also being reimagined through the influence of technology. The encounter between free creation and moving images, along with the synergistic combination of auditory and movement elements, opens up new intermedial possibilities, positioning dance, viewing techniques, and art as one. The vision of Roy Ascott (1988), a prominent artistic thinker of the 20th century, appears to be on the brink of realization: technology is not merely a tool but a new field of creativity. In sum, the digital medium can expand the dimensions of improvisation, creating interactive, adaptive, and collaborative possibilities for the art of dance. The synergy between choreographic creativity and technological innovation can open up new avenues, offering a path toward technology-driven renewal in the dance arts, while also allowing for the joy of co-creation and improvisation.

Figure 5
Excerpt from *Soundpainting with Body*. [Photograph] by Pál Csillag (2024)

References

Ascott, R. (1988) *Art and Education in the Telematic Culture.* Leonardo Electronic Art (Supplemental Issue): https://isea-archives.siggraph.org/wp-content/uploads/2020/12/1988-Ascott_Art-and-Education-in-the-Telematic-Culture.pdf

Cardew, C. (1967) *Treatise*. The Gallery Upstairs Press Buffalo New York, 3,5,18,76,77. Cardew https://mumia.art.pte.hu/mami/tartalom/oktatasi_anyagok/notacio/Cardew_Treatise/Cardew%20-%20Treatise.pdf

Gryllus S. (2015). A multidiszciplináris közösségi alkotás gyakorlata - Soundpainting. *www.academia.edu*. https://www.academia.edu/9998761/A_multidiszciplin%C3%A1ris_k%C3%B6z%C3%B6ss%C3%A9gi_alkot%C3%A1s_gyakorlata_Soundpainting

Gryllus, S. (n.d.). *Soundpainting*. Samu Gryllus. Retrieved April 5, 2025, from https://samugryllus.squarespace.com/soundpainting

Kézér, G. *Soundpainting with Body*. 27 May 2024, Budapest, Bethlen Tér Theatre.

Kézér, G. (2024). Project Pedagogy in Commercial Dance Education. Soundpainting with Body. *Tánc és Nevelés | Dance and Education*, 5(2), pp. 93–105. https://doi.org/10.46819/TN.5.2.93-105

Minors, H.J. (25 July 2011). Interview with Walter Thompson *Union des Musiciens de Jazz, Rue des Frigos*, Paris. http://www.soundpainting.com/blog/

We are pleased to offer this volume to all who wish to gain an insight into the presentations of the First International Conference on Dance and Digitalization, which was held at the Hungarian Dance University in November 2024. The conference explored the various intersections between dance, digital archiving, pedagogy, social media and emerging technologies. The selection provides a glimpse into how digital tools are transforming the creation, preservation and performance of dance in the 21st century.

Hungarian
Dance
University