Digital Annotation in Dance

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Introduction: Project ITI ♥ MOTION BANK

Dance, with its ephemeral and embodied nature, presents a continuing challenge when it comes to the preservation and transfer of knowledge, and different methods and technologies emerged to capture and communicate it. Annotation[1] tools offer the possibility, especially in the case of time-based media[2] such as audiovisual recordings and documentaries from the field of dance cultural heritage, to capture different aspects of dance and examine its frame and content in-depth and share that with other viewers of the media as well.

In its working area *Archive and Practice*, the International Theatre Institute Germany (ITI) brings up questions of practical audiovisual documentation. Within this frame, the cooperation project **ITI ♥ MOTION BANK** has been developed and implemented by ITI in collaboration with the [Motion Bank](#) team as part of the program "Kulturerbe Tanz". ITI ♥ MOTION BANK has a twofold aim: to explore how a video annotation tool can be of use to dance artists in their creative work, and how it can be put into practice in the archival (data) environment as well. These two levels of research were approached in parallel within the structure of ITI:

- [The Media Library for Dance and Theatre](#) which concentrates on documentation and research of performing arts,
- and the [STUDIO2](#), which provides space for developing ideas at the interface of dance, theatre and performance.

Motion Bank's interdisciplinary research focuses on the fundamentals of digital dance research, the digital documentation of dance and the use of digital technologies in dance practice. Since 2010, the Motion Bank research project has been developing software and methods for the annotation of time-based media, primarily video, in the field of contemporary dance.

The current version of Motion Bank Systems, which was tested during this project, is a web-based tool with the main function of adding annotations (text, images, audio, links…) to specific moments in a video or other time-based media. The software is created to be easy to navigate, and getting started is as low-threshold as possible. The characteristic that enables the ongoing research of and with the annotation tool is that there is not just one "how to" when it comes to the use, and the tool doesn't impose anything on the user either. While Motion Bank tries to provide the annotation tool to as many people as possible, it's important to note that it's not a commercial software product, but a research project with a small core team. It also means that collaborations such as this one can prompt discussions about possible improvements or new ideas on approaching documentation in a dance context.

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[1] In the context of this text, **annotation** is used in a broad sense and is defined the act of adding short explanations or notes which are associated with a particular point of the material. It is important to distinguish annotation from **notation**, which is referring to a written system used to record choreography.

[2] **Time-based media art** describes works of art that are dependent on time, duration, or function including video, film and audio artworks

The following pages refer to various aspects and features of Motion Bank Systems, specifically the toolset around video annotation[3]. To ensure clarity in the context of this document, the foundational components of this toolset can be described as:

- a central video player showing a selected video recording alongside various playback controls,
- a vertical list of created annotations of various forms accompanied by timestamps and sorted by their time of occurrence within the video on the left side of the interface, as well as on the bottom of the interface a horizontal timeline visualization of the duration of the video with annotations from the represented as coloured markers
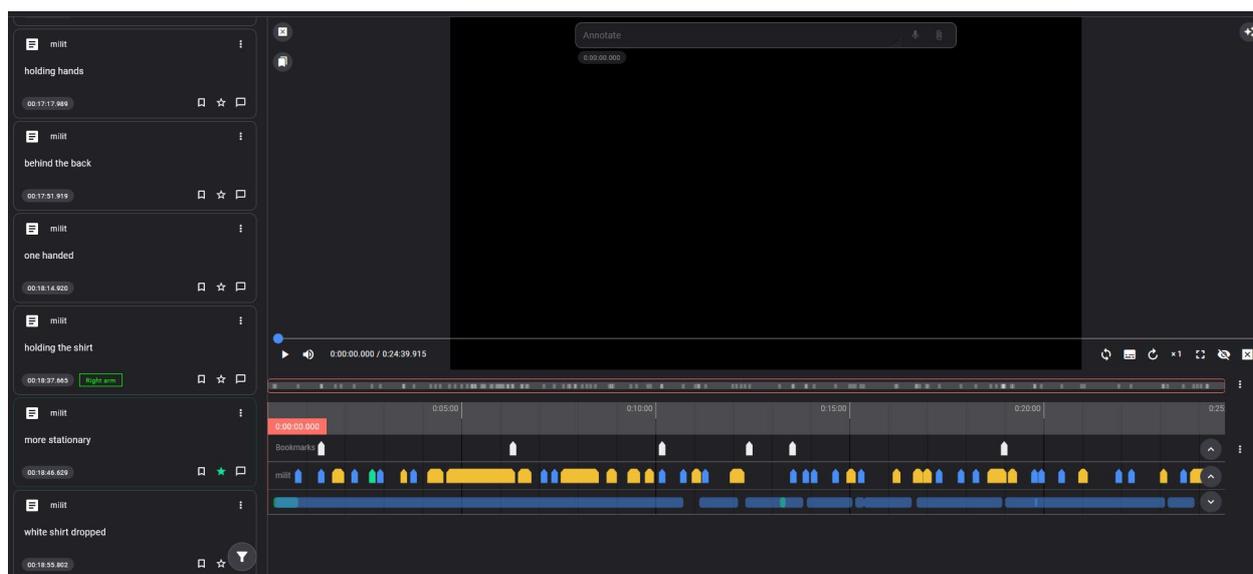
Main interface for video annotation showing the video player, annotation list and timeline.

Most other features mentioned in this text are nested within these main sections of the annotation interface. An informative overview of the features is available via Motion Bank's tutorial page (with reference to a previous version of the software).

ITI ♥ MOTION BANK took place in the timeframe between April and December 2024. The project was developed with a central question of what video annotation can offer as a possibility in the field of performing arts and which could be the methods and strategies of annotating dance or other physical practices in the following use case trials:

1. To annotate materials from the Collection of the Media Library for Dance and Theatre (MTT) using the current version of the software to test its applicability in the archival setting for on-site viewing, as well as for documenting artistic and discursive activities
2. To adapt the Motion Bank Systems software and then implement it within the infrastructure of the Media Library for Dance and Theatre to allow users to annotate videos from the collection

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[3] While annotation workflows without a video recording to relate to was also touched on within this project, the toolset using a video can present a good starting point for discovering the tools and features that can also be applied outside of a video context.

Media Library for Dance and Theatre of the German Centre of the International Theatre Institute

3. To conduct an artistic residency at STUDIO2 with open-ended artistic research using the video annotation tool.

Two further texts are available as an outcome of these explorations: one discussing the practical use of the annotation tool in STUDIO2 for production and documentation, and the other exploring the application of Motion Bank Systems in the Media Library for Dance and Theatre, focusing on the tool's potential for archival research.

Applications of Video Annotation in Dance Practice: Motion Bank Systems at STUDIO2

As a meeting place for testing performative, documentary and interdisciplinary ideas, STUDIO2 at the International Theatre Institute (ITI) is often the starting point for artistic experiments and productions that are presented on Berlin's stages. Due to its proximity to the Media Library for Dance and Theatre (MTT) and the Media Studio (the ITI's digital and technological facilities and infrastructure), one of the studio's focal points is the combination of artistic practice, its documentation and the theoretical questioning of the preservation of artistic processes. The STUDIO2 team often works together with artists, scholars and developers, and considers the studio as an extended archive, and the media library as the extended rehearsal room.

Greek choreographer [Eleonora Siarava] was working as a residency artist in STUDIO2 from 23.09. until 29.09.2024 as part of the cooperation ITI ♥ MOTION BANK. Through a targeted open call artists were invited to apply for the residency program, requiring a beginner's experience with the Motion Bank annotation tool. For the duration of one week, Eleonora tested the practical applicability of the tool in the processes of research, production and documentation of artistic work, from the perspective of a choreographer. Her insights are valuable inputs when it comes to making the tool accessible in STUDIO2 for users who have an interest in expanding their practice with digital methods. The residency was process-oriented, emphasizing experimentation and research without pressure for a final presentation.

In the framework of the residency, the following activities took place:
- Prior to the residency: an interview was recorded with Eleonora, discussing her artistic practice, her approach to the dancing body and its relationship with technology, and how these influenced her residency experience.
- On the first day of the residency, David Rittershaus, director of Motion Bank, gave an introduction workshop on the Motion Bank Systems. He was there to support Eleonora in her work during the first few days, providing an overview of the system's capabilities and the versatility of media that can be used for annotation. His introduction offered an initial orientation and opened up many possible directions for further exploration.
- On the second day, a public event took place in the Media Library for Dance and Theatre in the form of a relaxed discussion with Eleonora Siarava, David Rittershaus, the team of the Media Library and guests. A glimpse into Eleonora's

residency experience was followed by a presentation on how Motion Bank's Annotation tool will be integrated into the Media Library for Dance and Theatre and a discussion about how artists can make use of it in their practical and theoretical research.

First outcomes

Throughout the residency period, there were evaluation sessions in STUDIO2 with Eleonora Siarava and the MTT team, which were recorded and are available for on-site viewing at the Media Library. Here is a summary of what emerged:

Eleonora's focus throughout the week was on the potential uses of the annotation tool in the production development process. With video material as a central point, she experimented with various types of data that she could bring into the system through annotation. For Eleonora, the Motion Bank tool worked as a digital notebook that can connect different types of media. In this sense, it can also be viewed as a personal archive in a way that it allows bringing extracts of old materials as references for new input. During the evaluation conversations, terms like "note-taking", "video memoir" and "video sketchbook" were used to describe her usage of the tool. Towards the end of Eleonora's residency, an impulse arose to integrate the annotation tool into her upcoming performance, along with a vision of collaborating with a dancer to further develop and refine her ideas using the tool.

As the residency was experimental in its nature, the multiple discussions throughout the week served as exchange points on assumptions and imaginations, as well as critical reflections on potential future applications inspired by the initial experiences of working with the tool. What started as a familiarisation process, very soon became a creative one due to the easy navigation through Motion Bank Systems. Annotations could fulfil multiple purposes, such as linking loosely connected ideas to specific points in the video or functioning as possible additions to (choreographic) concepts shown in the video, including instructions directly attached to visual content. All this has a potential to change the mindset of a creative process and bring new perspectives on capturing and conveying dance (as a bodily practice).

Potential uses of video annotation in rehearsals and creation processes

During the rehearsal period, the tool can be used to take notes and on top of that, the system allows adding different formats of information, ranging from written notes, images or photos from the space or scores, audio material, other videos, extracts from previous rehearsals or any other kind of visual material that performing artists usually bring into the creative process. This enables a wide range of references to be organized within the same environment (on the same timeline), which can also be easily shared with collaborators. That might come in handy when the members of the artistic team cannot be physically in the studio.

The tool also revealed its creative potential, such as by experimenting with different playback speeds, allowing other forms of the same material to uncover hidden aspects of the movement material (e.g., through features like pose recognition and abstract body

representations), which can be inspiring. Other than the tool being used in a practical or analytical sense, it could also be used with the idea of creating an artwork within an artwork, by combining the uploaded data in creative ways. This characteristic further blurs the divide between documentation and production development, Eleonora noted.

Another feature of the tool, the Live Annotator, enables capturing annotations in real-time independent of a video. It's also possible to record a video in parallel, to which the annotations will refer after the recording is completed and uploaded. In essence, this feature enables capturing events in real-time as they happen, which can prove itself useful when thinking of revisiting specific moments from a rehearsal.

Possible challenges

Video has established itself as a relevant medium in the last decades, with literacy and awareness for the medium developing in the dance field over time as well. Dance artists have established ways of working with video which allow engagement with recordings not as exact representations of live performances, but rather with an awareness of the medium's restraints and strengths. While video lacks the shared, communal experience of live performance, it provides unique opportunities for detailed analysis and repeated viewing of specific moments, which is something not possible in a live setting. Nonetheless, using the video when working with performing arts changes the creative process, since it exists as another layer and offers a mediated experience – not the space and time in the room, but a second view and another perspective. It inherently shifts the way an artist interacts with the material and for some, video is something they don't relate to at all.

In addition, there is also the potential for annotation to impose itself on the creative process, due to it being structure and analysis-oriented, shifting the focus from experimentation and spontaneity, which can lead to a sense of being constrained by the need to produce a coherent structure that lends itself to annotation.

In summary

Motion Bank Systems annotation tool makes a case for its use as a rehearsal journal, providing documentation of the creative process, and supporting production development. While it shows many advantages, there are also challenges to consider when it comes to integrating technology into a creative process. That said, practice is the main focus of Motion Bank's research, with exploring different ways of capturing the body at its core—an approach that was also reflected throughout this collaboration. It's important to note that this is a pilot project with no fixed end product and that the software and its applicability for artists in STUDIO2 are still being developed.

If you want to discover Eleonora Siarava's choregraphic works up to now, they are available for on-site viewing as a part of the MTT collection, as well as the before-mentioned audio recordings of the interview, relaxed discussion and evaluation sessions.

Annotating the Archive: Motion Bank Systems at the Media Library for Dance and Theatre

The Media Library for Dance and Theatre (MTT) is a centre for artistic and scientific research and discussion for those involved in the performing arts. It is one of the most extensive publicly accessible audiovisual documentation centres for the performing arts in Germany. A variety of video materials cover documentation of performances within various disciplines of performing arts, genres such as dance films and documentaries, as well as documentation of discursive formats like conferences, lecture performances and symposia. This diversity enabled a broad range of use cases of the annotation tool, as it opened possibilities to test various combinations of approaches. MTT connects with an audience consisting of researchers and artists, many of whom seek to go beyond simply viewing the available materials. One of the first impulses while viewing the videos is to take notes and add in information that connects observations to specific points either in spatial or temporal sense.

Within the cooperation ITI ❤ MOTION BANK, the video annotation tool developed by Motion Bank was tested in a frame of how MTT visitors could use it for different types of research as well as from the perspective of working in the archive to facilitate and support the tool's usage. The working process was documented through writing and screenshots, while the videos were selected to simulate the various possible applications, ranging from dance film to movement- or discourse-oriented material. Each of these formats and approaches offered different annotation processes and could serve distinct purposes according to the working needs. The try-outs are documented and published within this evaluation with an aim both to familiarise archive users with the possibilities of a video annotation tool and to serve as an example for the implementation of similar workflows in other institutions and collections. All examples are taken out of the stocks of the Media Library and were carefully chosen to make use of different options of the tool of Motion Bank.

1. **Chapter segmentation and indexing**

Der Gehängte im Garten der Venus ([MCB-DV-8991](MCB-DV-8991)) is a dance film by Lutz Gregor, Claudia Feest and Dieter Heitkamp, which premiered on 12.12.1988 in Akademie der Künste in Berlin. Being a dance film, it was chosen because of the specificity of the medium – to annotate the movement, but also the filmic frame in which it unfolds.

Chapter segmentation was one of the first things that was tried out. It came down to marking the scenes with a title, which comes with a timestamp and a mark on the timeline. This proved to be useful when it came to locating specific moments within the video and getting familiar with it. The bookmarking feature was used for this action, as it is separately shown on the timeline and differently in the annotation list.

Marking transitions, subchapters and editing techniques lead to an observation - when annotating with a specific task in mind and while rewatching the video, more and more details come to attention, which consequently deepens the understanding of the video at hand and prompts more annotation tasks. All these annotations were differentiated visually in the list and different layers of information were sorted using comments and a highlighting

feature. Annotations highlighting a specific moment in time compared to those annotating a timespan are visually distinct in the annotation tool's timeline representation.

First outcomes: The Annotation list can give an overview of important moments and make visible the structure of the video. Coming back to specific points in the video is much easier, while naming and describing the contents of the video opens up the pathway to analysis and interpretation.

2. **Annotating content, cues, choosing details to focus on, qualities**

The second video that was annotated was *Turning Solo* ([MCB-DV-8645](#)), the portrait for Naïma Ferré, in which whirling practice is brought into dialogue with Isabelle Schad's ongoing movement research. The video was chosen as it is a solo work with only one body to observe and capture, and because of its distinctive trait - a slowly but constantly transformational movement quality – which offered itself to annotation.

The process of annotation with a determined research question added to the quality of observing – the emergence and changes of movement patterns and elements that interact with the details of dance (like props, light and costume) also became important. To capture these complex relations that might be perceived differently by different people, a personal terminology for capturing the choreography emerged and developed during annotation.

The Machine Learning-based feature for pose recognition automatically recognizes basic segments of the human body and draws a coarse skeleton over the body. It's then possible to select body parts or single joints and assign annotations to them, which proved useful for capturing targeted details within the choreography.

First outcomes: Dance and physical practices contain a lot of information which might not be apparent at first view. Deciding on a central research question while annotating can lead to a more focused annotation process. From there, each person can find their own way of deciding which moments are worth capturing and how to connect the annotations. The tool also revealed a knowledge repository potential, where people with diverse information specifically related to the videos can share it with other users, thus enriching the archive.

3. **Voice annotation, categorising and filtering annotations**

Turning Solo 2 ([MCB-DV-12269](#)) is a continuation of the work *Turning Solo*, with two dancers interpreting the same choreographic material. This video was annotated experimentally during the first watch, using a voice recording feature throughout the whole duration of the piece, which was then transcribed, processed and converted into an annotation.

The approach to annotation shifts depending on the medium – writing text calls for a more structured analysis, while audio recording allows more spontaneous observations. The recorded audio can be saved as annotation and played over the video, but the transcript of it can be best seen as a thought mediation tool between speech and writing.

After editing the notes, a need to categorize them came up, and a "hashtag system" was applied, where custom categories were created and marked with a symbol **#** for easier searchability. It can be helpful in locating the large number of annotations and categories in the list. Filtering of the annotations is possible by keywords, annotation type

(highlights/comments), media type (image/video/text/audio) or analysis type (people recognition/speech to text).

Furthermore, for the purpose of highlighting a single person in group or ensemble pieces, the Machine Learning-based feature for people detection automatically identifies bodies in the video image and draws boxes around them. It's then possible to select these boxes and assign annotations to a specific box/person.

First outcomes: The hashtag categorization system is just one of many possibilities for structure and recall. There is a lot of creative room to apply such methods according to the annotation objectives. Audio recordings turned out to be useful to gather initial thoughts, and then develop further reflective annotation stemming from there, may it be textual or not. A possible future archival use could be that choreographers (or any other artist involved) watch their own videos and record audio reflections or discuss the concepts they worked with and share insights into their creative process.

4. **Referencing external sources, subtitles**

The material for this use case was a recording of an event that was part of the series *Zwischenrufe/Interventions* (MCB-DV-3523), which is centred around dialogues on stage between the body and language, where artists Yvonne Rainer and Xavier Le Roy met to discuss and exchange current concepts and projects. This video was chosen to try out how annotation can be of use for more discursive formats, with an aim to link references outside the video recording itself and build connections between them.

The process began with transcribing the audio by using the automated speech-to-text feature, which generated subtitles and enabled automatically transcribed annotations of interesting quotes.

The annotation list was used for referencing people, places and objects at the times that were mentioned within the recording, as well as for marking key points of conversation. At the time there was no singular database which could provide for the references, therefore links to information that is easily searchable on the internet were added.

First outcomes: An annotation list can be used as a resource for providing further context and other relevant references about the artistic work or points of a discussion. By inviting a person who was somehow involved in the video at hand, annotations can be used to add background information that is not evident from the video alone. When it comes to information sources and extensiveness of the references, the implementation of Motion Bank Systems would include making sources from the Media Library for Dance and Theatre catalogue easy to find directly from within the tool. A question emerged when it comes to annotating information that is not bound to a specific time within the video but to the video content in general, and it's something Motion Bank is currently working on.

Implementation of Motion Bank Systems in an archive

When imagining how Motion Bank Systems could be implemented in the archive, the discussions always ended up in the direction of activating the archive. The annotation list together with the archival material could become interfaces where people can leave their own reflections and then interact with each other's thoughts as well. Additionally, the

annotation tool within an archive context can serve for linking different materials, documents, places and people within a video, creating a cartography and structuring a network of information.

Besides personal use, sharing annotations could introduce a new dimension of interaction which could be between collaborators on a project (which is already possible) or future visitors (which is planned to be possible) as well as between archive users and the archive itself. Planning for annotations aimed at an unknown future audience could be an intriguing aspect to consider. Annotations themselves could become part of the archive, adding layers of complexity and capturing a spectrum of reactions where different viewers can contribute with varying perspectives (e.g. one might focus on technical movement analysis, while another might reflect personal memories or interpretations from seeing the performance live). Annotations capturing multiple views for the same video could offer contrasting views and reveal how people remember or interpret the same moment differently over time.

The whole idea of the archive is shifting as well, it's not just about documenting chronology and factual information. It also delves into the idea of post-history, questions what the truth really is and consequently creates a multi-layered concept of archive. Instead of just focusing on who the director and choreographer were, when the work was made, and which production house was involved – it becomes a question of personal and interpersonal knowledge. The idea of putting assumptions into databases exists and is something archivists are aware of, knowing that there's no linear history and that there's a need for multi-personal and non-hierarchical knowledge which should be followed. The annotation tool suggests itself to be a fitting tool for this process. Moreover, the use of the annotation tool from an artistic perspective could help blur the often-rigid boundaries of scientific and scholarly vocabulary by finding and coming up with own descriptions and words. A more contextual, personal or nuanced understanding of documentation and reflection about dance might arise from that.

As many of the videos from the MTT collection cannot be viewed outside the archive itself due to copyright regulations, the subject of "taking home" what users do in the archive was also addressed during the discussions, and how annotations can serve a purpose in that case. Exporting annotations Is currently possible in formats like JSON and spreadsheets; the first being directed towards exporting data in a coding-friendly format, while the latter is a more accessible format that can also be printed out and preserved. The key idea was to use non-proprietary and standard formats which ensure that the annotations are readable in the future, even though the original software or digital tools are no longer available.

Overview and further reading

ITI ♥ MOTION BANK is a unique collaboration with the Motion Bank Systems being applied to a public archive of the performing arts. It's an ongoing process full of trials and experimentation, and therefore it is crucial to note that this is a pilot project with no fixed product as a result and the implementation of the tool at the MTT to make it available for the users is still in progress and aims to be finished in early 2025.

A publication by Rebecca Stancliffe (Trinity Laban Conservatoire), David Rittershaus (Motion Bank) and Scott deLahunta (Motion Bank, Coventry University) on *Digital Annotation and the*

Understanding of Bodily Practices is available for further reading about the topic. It contains a collection of articles on practice-based research which do not only refer to the Motion Bank tool, but also other annotation tools and practices. Another recommendation for diving deeper into the subject is Motion Bank's Medium page, where reports about the research at Motion Bank / Hochschule Mainz can be found.

If you are interested in using the current version of Motion Bank Systems, you can directly contact the Motion Bank team at office@motionbank.org, and if you want to know more about the ITI ♥ MOTION BANK project, or try out the annotation tool in STUDIO2 or MTT, you can reach out to c.henniger@iti-germany.de.

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