

# Dance Becoming Data Becoming Dance: A Pendulum Movement Through 20 Years of Dance Data

Anton Koch <sup>1</sup>



**Abstract** | *This article highlights the importance of relational and embodied practices for the construction of a counterweight to ongoing shifts in the dominant modes of digitisation and automation. Specifically, it traces these shifts along two decades of dance digitisation research in juxtaposition to extractive, capitalist data practices.*

KEYWORDS: Dance. Practice. Technology.

**Dança transformando-se em dados, dados transformando-se em dança: um movimento pendular ao longo de 20 anos de dados sobre dança**

**Resumo** | *Este artigo destaca a importância das práticas relacionais e corporificadas para a construção de um contrapeso às mudanças contínuas nos modos dominantes de digitalização e automação. Especificamente, ele traça essas mudanças ao longo de duas décadas de pesquisa sobre digitalização da dança em justaposição às práticas extrativistas e capitalistas de dados.*

PALAVRAS-CHAVE: Dança. Prática. Tecnologia.

**Danza que se convierte en datos que se convierten en danza: un movimiento pendular a través de 20 años de datos sobre danza**

**Resumen** | *Este artículo destaca la importancia de las prácticas relacionales y corporizadas para la construcción de un contrapeso frente a los cambios en curso en los modos dominantes de digitalización y automatización. En particular, rastrea dichos cambios a lo largo de dos décadas de investigaciones sobre la digitalización de la danza, en contraposición a las prácticas extractivas y capitalistas de los datos.*

PALABRAS-CLAVE: Danza. Práctica. Tecnología.

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<sup>1</sup> Mainz University of Applied Sciences, Mainz, Germany. Email: [anton.koch@hs-mainz.de](mailto:anton.koch@hs-mainz.de)  
Orcid: <https://orcid.org/0009-0002-1072-9332>

The widespread push in the last few decades towards digitisation, or rather “datafication” – to be more specific – has given rise to a digital landscape in which data has become a raw material to be mined, processed, and turned into capital beyond traditional market rules, especially since the advent of generative artificial intelligence (AI). For companies equipped with the necessary resources and technological infrastructure, any publicly available collection of cultural artefacts can now become an asset for capitalisation not just through appropriation, but also derivative reproduction. In their 2024 analysis of the extractive strategies of tech corporations, media scholars Ulises Ali Mejias and Nick Couldry describe this capitalist “data grab” as a continuation of colonialist practices. This is significant as it gestures at a broader problem that reaches beyond discussions about property rights. The large-scale exploitation of unlicensed material is only one problematic aspect. To understand the specific significance of the technological and economic shift towards generative artificial intelligence for the arts, it is beneficial to frame a critical analysis that builds on critiques of science and technology, providing an extended scope ranging from contemporary implementations to the study of their underlying political economies and epistemological foundations. In the following article, I aim to highlight the importance of alternative perspectives on and approaches to data and digital practice that were already formulated two decades ago. These approaches are reflected in my own practical work as a research software engineer with the Motion Bank project, which was initiated in 2010 by the choreographer William Forsythe and explores digital methods for the capture and transmission of choreographic concepts. They foreground embodied and relational practice and refocus data as a means rather than an end. The article, therefore, works in a pendulum motion, first looking backwards from the advent of generative AI to previous experiments with dance data, then extrapolating from there to propel towards future modes of digital practice informed by critiques of technology and digital ecologies.

### **Return: Two decades of “Software for Dancers”**

In his 2017 article „Dance Becoming Data”, Scott deLahunta revisits several interdisciplinary projects originating in the research initiative “Software for Dancers”, which set out to facilitate “conversation about creative process in dance to take place between choreographers and coders; a conversation focused on methods, approaches, histories and contexts.” (DELAHUNTA, 2017) Starting in the early aughts and running up until the mid-2010s, each project brought together a diverse range of choreographers, coders and researchers, “embracing digital technology as a means for furthering their particular research enquiry” (DELAHUNTA, 2017). The projects each assigned different significance to

the role of data and technology, with Wayne McGregor creating an interactive choreographic agent, Emio Greco exploring systems of notation and transmission of inner intent, Siobhan Davies sharing an archive of raw choreographic source material and William Forsythe probing digital approaches to making the inner workings and structures of choreography visible to an audience via so-called "Online Scores" (DELAHUNTA, 2017). In these distinct setups and processes, digital data would serve very different purposes as an ephemeral or intermediary medium for (real-time) analysis and study or as semantic artefacts for long-term safeguarding and archival. In a subsequent "Dance Becoming Data: Version Two" from 2018, deLahunta expands on the differences between the two sets of projects by setting up a frame using Yuk Hui's specific concept of data "follow[ing] the logic of digitization after the emergence of modern computational machines", as well as Toni Sant's definition of "systematic documentation" (DELAHUNTA, 2018, p. 334). While Sant is focused on an archival perspective, aimed at managing data by "applying the evolving standards of information science", Hui is concerned that the potential of data is being limited by the constraints of computer science's narrow focus on "practical applications" (DELAHUNTA, 2018, p. 334-335). These two perspectives further open a space in which dance data can be both informative, as is the focus of the later analytical and archival-focused projects, but just as well an unstable or intermediary substrate. While the specific objectives, methods and mechanics differed, all projects ultimately shared "questions emerging from and around the practical work of documenting and digitising the processes and products of dance making." (DELAHUNTA, 2017) Furthermore, the projects facilitate a connection of dance and (creative) coding in approaching both disciplines as an open-ended, relational and exploratory practice that can reach beyond the limits of a linear mindset working from supposed problems towards their solutions through generalised products built on standardised "best practices".

While the presented projects were initially conceived as self-contained, one of them, Forsythe's "Motion Bank", was subsequently continued by its original co-director, Florian Jenett, who took it with him to his new professorship position at Mainz University of Applied Sciences in 2016. There, he initiated a new series of publicly funded research projects with a small team, focusing primarily on multimodal digital video annotation as a versatile method for capturing aspects of choreographic thinking by semantically connecting additional related information to the video material<sup>2</sup>. This article builds on deLahunta's

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<sup>2</sup> See Motion Bank website at: <https://motionbank.org/> Accessed at: 12. September 2025

proposal and Motion Bank's subsequent research, extrapolating their ongoing, if not increasing, relevance for a contemporary critique of research software engineering practice.

### **Shift: From "Everything is Data" to "Data is Everything"**

deLahunta describes a change in the discussion around data, in that the first decade was dominated by approaches that deployed dance data as an intermediary medium, rather than as an end in itself. This changed when, in the 2010s, following the emergence of Web 2.0 concepts such as the "social graph" (FACEBOOK, 2007) and the increasing visibility of Semantic Web concepts such as structured knowledge graphs in web-application development (SINGHAL, 2012), a more standards- and interoperability-focused perspective began to gain momentum. This perspective valued dance data as a source of knowledge to be managed, disseminated, and exchanged using standardised schematization and more common web technologies, rather than highly specialised and customised systems. In the context of the Semantic Web, the data now serves as a means of describing objects, both purely digital and physical, as well as their relationships by constructing data schemas called "ontologies." These ontologies define and describe their properties using custom vocabulary along with their associated definitions. Now, anything could be mapped using data and connected in a referential network of information that could be traversed by humans and machines alike.

This was the conceptual basis from which the work at Motion Bank continued in 2018, as its core annotation tool, Piecemaker, developed initially at the Forsythe Company and later rebuilt to facilitate the creation of the "Online Scores", received its third major overhaul, now implementing the W3C's "Web-based Annotation Standard". This standard utilises the concept of Linked Data, which originated from the Semantic Web project, to enable any resource identified by a "Uniform Resource Identifier" (URI) to connect through semantic connections, mapping their subject-predicate-object relations in a database that functions as a graph. This graph can then be queried by humans, traversed by automated agents, used to infer implicit connections between objects automatically, and is interoperable with other graphs or object collections by publishing the aforementioned "ontologies. For Motion Bank, this meant a departure from their previously proprietary data model in favour of an open web standard and the simple correlation of two schemata, "text commenting on time" and "video linked to time", to model a workflow in which one does not directly annotate a specific video asset, but record commentary on events in time as unstructured text that coincide with media recordings on a so-called "Timeline", a thematic grouping referencing "Coordinated Universal Time" (UTC). This method of placing comments in real-time while

one or more media recordings are running in parallel was the original concept of Piecemaker, as it was used in the Forsythe Company's rehearsals, but now the tool was producing standardised "Linked Data" and could also be used to annotate archival material. It is important to note here that Motion Bank's interpretation of the annotation standard rejected the inclusion of additional, more explicitly modelled and pre-structured schemata beyond the two forms of annotation as a free-form textual comment and a linked asset. This was done to leave further classification and description of resources to outside data providers in charge of the described objects, as well as leaving deeper inference of meaning open to the human actors inspecting the data. The decision to use largely unstructured data was consequential to an explicit acknowledgement of the shortcomings and fundamental ambivalence of using language when trying to map and approximate tacit, embodied knowledge. Instead of trying to formulate preliminary assumptions onto which data would later need to be fitted, the idea was to establish a basis for transitory, bottom-up schemata, where vocabulary or structure might emerge from layered multitudes of different perspectives, which could be traversed in multiple ways and from which a plurality of knowledge could be inferred, depending on the context of introspection.

This shift in perspective towards standardised and linked dance data would subsequently support a series of research projects over the coming years investigating methods and applications of semantic video annotation. However, around the same time that Motion Bank was focusing on dance data capture and transmission, another significant shift in perspective on data was underway. While generative adversarial networks (GANs) for image generation were already around for a few years, it was in 2018 that the first "generative pre-trained transformer" (GPT) was released, paving the way for what would eventually culminate in the "AI-boom" at the start of the 2020s with the release of image generator "DALL-E" in 2021 and chatbot "ChatGPT" in 2022. These pre-trained models made use of publicly available data on an unprecedented scale and, while discussions on ownership of data and its metadata were nothing new, merely deflected accusations of breaching ownership rights by anthropomorphising their training processes as "learning", akin to a human learning and creativity and, as such, constitute "fair use" (LEE, 2023). Irrespective of the legal issues, this new mode of facilitating new data generation using large quantities of existing data as source material entails another shift in perspective towards data.

If we recall the notions of "practice" mentioned at the beginning, the practices of dance, choreography, and creative coding are all fundamentally based on relational processes among peers and organised within a complex environment that shapes and is itself shaped by social exchange, reflection, and expression. Here, the resulting artefacts, such as

movement, sound, code, and text, are merely a consequence or visible surface of the complex processes and configurations that constitute the actual practice. However, it is precisely this surface that is ingested, mapped to language, and then stored as billions of “weak correlations” to be eventually reconfigured using stochastic methods to produce generative output of new data and media, as physicist and technology lecturer Dan McQuillan has argued (MCQUILLAN, 2022). The results are media artefacts devoid of an original underlying artistic process. This causes a disconnect from the artistic practice that generative AI is gesturing at by producing derivative simulacra of its creative output. But the question of whether the generated result is “real” art or convincing in the sense that it cannot be distinguished from artworks produced by humans is not the focus of this article. In his 2023 book “The Eye of the Master”, scholar Matteo Pasquinelli traces the development of the automation of social labour from Babbage’s project of replacing human “computers” with machines to today’s automation of so-called “white-collar jobs”. He identifies this continuous effort not as an attempt to automate cognitive processes, but as a project of capitalist organisation of labour for more efficient planning and extraction of surplus value through division, mechanisation, and deskilling of labour, thereby transforming social labour in the process. While there are many more angles to approach generative AI as an agent of creativity, this article builds on a labour-centric perspective on automation and its role in perpetuating colonialist practices of extraction, enclosure, and exploitation of commons that are “just there” for the taking (MEIJAS; COULDRY, 2024). However, the political and epistemological space of AI here is not the target of a call to abolition or reform, but rather demarcates a negative space, in the sense of a reference point for departure from which to construct possible practice-based alternative approaches to data and digital technology. In the second part of the original article, there was an interview with me, then only recently added to the Motion Bank team as a full-time research software engineer. Some of the ideas discussed there, such as a dance data archive functioning as “primordial ooze” for “Data Aided Choreography” (DELAHUNTA; KOCH, 2017), now seem to have a different connotation after the boom of generative AI changed the importance of data ownership and autonomy beyond the initial privacy concerns, but still hold some value as will be explained below. Others, such as the notion of conceiving digital ecosystems in research and the arts through functionally simple, transparent and interoperable design, but implementing them as hyperlocal, semantically ambivalent, ephemeral and context-dependent networks of information (DELAHUNTA; KOCH, 2017), are now more critical than ever to navigate the emergent transformations of creative practice caused by the massive push of companies

like OpenAI towards rebranding generative machine learning technology as universal or as a “general purpose technology” (ELOUNDOU; MANNING; MISHKIN; ROCK, 2023).

### **Alt + Shift, Return: Data Becoming Dance**

In the 2022 article “Recording Effect” on Motion Bank’s “Between Us” project, which digitally captured an entire dance piece as annotated video and full-body motion capture, then facilitated the production of in-depth documentation for transmission as well as new artworks, David Rittershaus cites Brian Massumi’s understanding of “the body [as] always immediately virtual and actual at the same time (p. 30), whereby [Massumi] describes the virtual as a realm of potential” (RITTERSHAUS; KOCH; DELAHUNTA; JENETT, 2022). While Rittershaus is using Massumi’s concept specifically as an example of the limitations of merely recording dance as movements from A to B, this notion of a body actualizing a virtual potential in motion is helpful to develop a proposal in line with deLahunta’s observations on “dance becoming data” and pointing towards an insistence on the essential quality of data rescued from a role of a passive resource to a substrate activated through social practice. If we imagine the dancing body as an actualization of “its own nonpresent potential to vary” (RITTERSHAUS; KOCH; DELAHUNTA; JENETT, 2022), then we could think of corpora of (dance-)data as a “[continuum], something that not only encapsulates fragments of heterogenous data, but remains in a constant fluctuation due to processes invoking the data, interpreting it, inferring relations and adding to it.” (DELAHUNTA; KOCH, 2017) Using “dance” as a metaphor for an embodied actualization of virtual potentials, I propose “dancing data” or “making data dance” in the sense that the data contains multitudes of meaning, its potential, that are activated through a dynamic and immediate “deep” inference within a social, creative, embodied and artistic practice. This is akin to what was proposed by “Software for Dancers”, in contrast to the surface-level machinic inference using stochastics proposed by proponents of the current wave of connectionist AI and labelled “deep” only by way of mechanical scale and complexity, not its broader metaphysical potential. This article is a proposal for a “return”, in the sense of the “détour” described by Louis Chude-Soukei referring to Glissant, not as a nostalgic reversal, but a pendulum motion that “returns to the origin of entanglement” (CHUDE-SOUKEI, 2023, p. 124), bringing with it all the complications and baggage. It is an attempt at a synthesis of the tenets of computer science, represented by Sant’s demand for interoperability and standardisation, with Hui’s cautioning against a purely mechanistic approach guided by ideas of supposed practicality. But today, this synthesis now urgently requires us to acknowledge the complicated and conflicted role of data and computation in a technological

sphere that is inherently shaped by neo-colonial and capitalist forces and largely based on a scientific foundation that emerged from the limited scope of the European project of “enlightenment”. It requires a fundamental acknowledgement of technology and science as inherently political expressions and the engagement with them as a political act. In the sense that every technology is an expression of a worldview, the choice and application of that technology, whether a specific form of performance or coding practice, are in themselves statements whose politics can be ignored, yet continue to affect and shape their environment. Bringing all these complications into the notion of “dance becoming data”, allows us to formulate conscious and explicit positions against certain transformations of creative processes and their increased dependency on a limited range of scientific and philosophic models, while still engaging in their creolisation and their queering in a way that strives for digital autonomy through a fundamental ontological opposition, not only towards “best practices” but the entire project of “western civilization” that finds its technological expression in today’s extractivism and digital solutionism. This autonomy also requires a return to practice, the nurturing of collective environments of care, and a fundamental divestment from singular, accumulative paradigms like “the cloud” with their convenient entrapment in totalising platforms and walled gardens. It is at this point of departure that I propose to attempt a “détour” by way of dance and its potential for emergent embodied epistemologies in relation to an engagement with pluralist, refractive study of technology, its politics and history using different lenses and languages that exist in the “digital periphery”. This proposal, however, grounded in my own decade-long interdisciplinary engineering practice with Motion Bank at the intersection of computer science and performing arts, also builds on an even more substantial axiom: that a local departure from canon and best practices in science and technology must be informed first and foremost by an extension of solidarity both to local and global social peripheries as well as inclusion not by epistemological assimilation, but pluriversal interrelation.

## References

CHUDE-SOUKEI, Louis. **Technologie und Race**: Essays der Migration. August Verlag, 2023. 258 p. ISBN 9783751890144

DELAHUNTA, Scott. **Dance Becoming Data**: Part One Software for Dancers. Computational Culture 6, 2017. Available at: <http://computationalculture.net/dance-becoming-data-part-one-software-for-dancers/>. Accessed at: 12. Sep. 2025



DELAHUNTA, Scott. **Dance Becoming Data**: Version Two. In: ELLIS, S., BLADES, H., WAELDE, C. (Eds.), *A World of Muscle, Bone & Organs: Research and Scholarship in Dance* (pp. 333-357). Coventry, C-DaRE at Coventry University, 2018. p. 334; p. 334-335, ISBN: 9781846000836

DELAHUNTA, Scott; KOCH, Anton. **Dance Becoming Data Part Two**: Conversation Between Anton Koch and Scott delaHunta. *Computational Culture* 6, 2017. Available at: <http://computationalculture.net/dance-becoming-data-part-two-conversation-between-anton-koch-and-scott-delahunta/>. Accessed at: 12. Sep. 2025

ELOUNDOU, Tyna; MANNING, Sam; MISHKIN, Pamela; ROCK, Daniel. **GPTs are GPTs**: An Early Look at the Labor Market Impact Potential of Large Language Models. arXiv, 2023. Available at: <https://doi.org/10.48550/arXiv.2303.10130>. Accessed at: 12. Sep. 2025

FACEBOOK. **Facebook Unveils Platform for Developers of Social Applications**. Facebook website, 2007. Available at: <https://about.fb.com/news/2007/05/facebook-unveils-platform-for-developers-of-social-applications/>. Accessed at: 13. December 2025

SINGHAL, Amit. **Introducing the Knowledge Graph: things, not strings**. Google website, 2012. Available at: <https://blog.google/products/search/introducing-knowledge-graph-things-not/>. Accessed at: 13. December 2025

LEE, Timothy. **Stable Diffusion copyright lawsuits could be a legal earthquake for AI**. Ars Technica, 2023. Available at: <https://arstechnica.com/tech-policy/2023/04/stable-diffusion-copyright-lawsuits-could-be-a-legal-earthquake-for-ai/>. Accessed at: 17. May 2024

MEIJAS, Ulises; COULDRY, Nick. **Data Grab**: The New Colonialism of Big Tech and how to Fight Back. WH Allen, 2024. 320 p. ISBN 9780753560211

MCQUILLAN, Dan. **Resisting AI**: An Anti-fascist Approach to Artificial Intelligence. Policy Press, 2022. 190 p., ISBN 9781529213508

PASQUINELLI, Matteo. **The Eye of the Master**: A Social History of Artificial Intelligence. Verso Books, 2023. 273 p., ISBN 9781788730082

RITTERSHAUS, David; KOCH, Anton; DELAHUNTA, Scott; JENETT, Florian. Recording "Effect": A case study in technical, practical, and critical perspectives on dance data

creation. In: FERNANDES, Carla; EVOLA, Vito; RIBEIRO, Cláudia. **Dance Data, Cognition, and Multimodal Communication**. Routledge, 2022. 465 p. ISBN 9781003106401