2
DIGITAL APTITUDE

Finding the right questions for dance studies
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2.1 Introduction

2.1.1 Trajectories from the intersection between dance and digital

Dance research has evolved significantly over the past four decades, during which dance studies has been established as an academic discipline with its own university departments, courses, publications, conferences and networks. The scope of the discipline has widened significantly during this time. As Janet O’Shea, co-editor of The Routledge Dance Studies Reader points out:

The period from the late 1980s to the early 2000s was one of intense activity in dance scholarship, characterized by fundamental shifts in the field. Dance writers no longer concerned themselves only with the dance work and the artist’s biography but also with how dances engage with their social, historical, political and economic contexts. (2010: 1)

Scholars in dance studies now often draw on thinking from disciplines such as literature, anthropology, history, cultural studies, gender studies, critical race studies and philosophy, among others. This broadening of the field has called for the adaptation and development of various research methods drawn from the different disciplines, and the field of dance studies, like performance studies before it, has demonstrated how adept it can be at this. Therefore, given the rapid growth of the field of research, new theories, methods and tools, referred to as the digital humanities, one might imagine dance scholars would have begun to integrate new digital methods of study into their research. Especially since the early 1990s, when ‘digital dance’, sometimes referred to as ‘dance and technology’, established itself as a sub-field within creative dance practice (see Birringer 1998; deLahunta 2002; Dixon 2007; Salter 2010).1 However, based on a general lack of evidence from the field, e.g. indicative panels and papers at prominent dance studies conferences, this is arguably not the case to date.2 The proposal we wish to make here draws attention to the role of digital aptitude in the development of digital methods for dance studies. Crucial to digital aptitude is understanding how to combine the right research questions and frameworks with the appropriate digital tools. To do this we will firstly focus on a narrower field of research emerging from practice and tightly connected to the development of ‘digital dance’. Secondly, we will consider projects which demonstrate the combined approach we envision required for dance studies to make advances in digital methods for research.

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The term ‘digital dance’ refers to dance making processes and performances that include digital technologies as an integral feature. Starting in the early to mid-1990s, dance and technology artists used the early Internet for distributed performances, explored the multimedia potential of the CD-ROM and experimented with sensor technologies to map movement and gesture to other media (e.g. sound and video) in real-time. Importantly, these projects often involved close collaboration between dance artists and technology specialists, usually artists themselves; composers, filmmakers, designers, with expertise in computer hardware and software. Many of these same basic ideas and kinds of collaborations have continued since the end of the twentieth century with more emphasis on 3D motion capture, developments such as ‘wearable technologies’ and more recently robotics, Artificial Intelligence and Virtual Reality applications have been incorporated into dance making. Whereas dance scholar Harmony Bench (2015), proposes a distinction between these practice-based developments and dance studies research using digital methods, we wish to point towards a continuum between the two areas and consider how research and thinking about dance and digital technology has arisen from practice, in particular where ‘digital dance’ has evolved alongside the documentation turn in contemporary dance practice.

Over the past two decades, there has been a shift in the ways that the documentation of dance takes place as well as a re-thinking of its value and potential contribution both to the development of the art form and its communicative potential. This documentation turn signals not only an examination of how and why dance might be inscribed, preserved and shared, but also a change from thinking about documentation as ‘other’ to artistic practice to considering it as an integral part of the form. The ephemerality which is often understood to be fundamental to what dance ‘is’ makes the nature of its documents particularly interesting, and a number of scholars have explored this new thinking around the relationship between performance and its record (see Boxberger and Wittmann 2013; Reason 2006; Sant 2017; Whatley 2008). The increased presence of practice-as-research within the academy, as well as the growth of digital technologies and their effect on the recording, analysis, representation and distribution of artistic practice are factors that have contributed to this rethinking of the role and value of documentation. Practice-as-research opened the way to questions regarding the epistemic yield of embodied practices including dance, aligning these practices with other disciplinary fields. This has interesting implications for dance documentation, shifting it away from the domain of historical preservation toward a means of knowledge transmission. Furthermore, the advent of digital recording technologies and their subsequent widespread availability, particularly video, significantly altered the conversation about the documentation of dance, with many scholars examining how technology impacts on the nature of dance and its records (see Bleeker 2016; Dixon 2007; deLahunta and Shaw 2006 & 2008). In the field of contemporary dance, documentation is now often viewed as an integral part of the creative process and/or the work itself (see Khan 2018). In research contexts which are often interdisciplinary, as will be discussed below, documentation is increasingly examined as part of contemporary dance and integral to our understanding of the form.

The evolution of ‘digital dance’ practices alongside this shift in dance documentation can be seen in a small number of ambitious interdisciplinary choreographer-led research projects that sought to bring choreographic ideas and processes into new exchanges with general audiences and other specialist knowledge areas. The projects were developed primarily in the first decade of the twenty-first century and grew from artist-led experiments with technology. This collection of projects, sometimes referred to as ‘choreographic objects’ (Leach, deLahunta and Whatley 2008) involved various collaborations between dance artists, interaction designers, filmmakers, programmers and scientists. They drew on a range of digital approaches to analyse and visualise choreographic principles and became the focus of diverse scholarly study for the first time in Maaike Bleeker’s edited collection Transmission in Motion: The Technologizing of Dance (2016).

Each in their own way, these projects explore the potential of various technologies (from the old technology of writing to the latest possibilities for motion tracking and movement steered interfaces) to become how we create, make sense, and share. Together these projects offer a
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complex image of knowledge cultures in transformation. The ways in which they explore the potential of various media from the perspective of dance reflects broader transformations in practices of knowledge transmission” (Bleeker 2016: xx-xxi)

In this chapter, we discuss some of these projects and examine what they meant for the development of dance research and practice, before turning our attention specifically to the role of annotation within the field. We go on to discuss Movement on the Move, a project which does not belong to the field of ‘choreographic objects’ and has different aims in as much as it arises not from dance practice, but from the needs of dance scholarship, in particular the historical study of dance touring. This project, led by dance scholars Kate Elswit and Harmony Bench demonstrates how digital methods might enhance knowledge about dance, using map visualisations to highlight the circulation of dance through different cultural contexts.

The term digital methods can be misleading as many of the procedures used are already standard and “not unique to the digital realm” (Berry and Fagerjord 2017: 107). However, we will use it following Bench and Elswit (2016) to describe some of the ways that technology has been adopted and collaboratively developed by dance practitioners and researchers to enhance understanding of dance. More precisely, we propose that digital methods rely on the development of specific questions and frameworks and a certain level of aptitude with digital technologies to be used effectively. By putting both the ‘choreographic objects’ projects and Movement on the Move into dialogue, we aim to draw attention to these key aspects.

2.1.2 Choreographic objects

A pivotal moment in the development of ‘digital dance’ practice and research was the publication of choreographer William Forsythe’s CD-Rom Improvisation Technologies: A Tool for the Analytic Dance Eye in 1999, which he created in collaboration with the ZKM/Center for Art and Media beginning in the mid-1990s (Forsythe 1999). The distinctive component of Improvisation Technologies are lines drawn on top of digital video to demonstrate some of the key principles of Forsythe’s approach to improvisation and make potential connections between body parts visible. Former Forsythe dramaturg, Rebecca Groves suggests that the CD-Rom “offered a new pedagogical tool for professional and student dancers. It provided audiences with a set of analytical skills to become better readers of dance performances” (2007: 92). In the mid-1990s, multi-media was seen to be the leading edge in digital development (see Gansing 2016), and Forsythe’s Improvisation Technologies was considered the exemplar of what could be done using digital technologies to communicate or transmit dance knowledge. As such, the CD-Rom was an early and significant contributor to the documentation turn in dance. In 2005, Forsythe followed up the collaboration with ZKM through a close research partnership with the Advanced Computing Center for the Arts and Design, The Ohio State University, to create the website Synchronous Objects for One Flat Thing, reproduced (Forsythe, Shaw & Palazzi 2009). This project involved a large interdisciplinary team including geographers, mathematicians, designers and architects, working alongside dance practitioners, researchers and programmers. During a four-year period, they examined the abstract choreography of Forsythe’s One Flat Thing, reproduced (2000) from a range of different perspectives and used a variety of digital approaches to demonstrate its principles. The resulting visualisations, interactive tools and explanatory graphs and presentations are outcomes of the team’s attention to the structuring principles of the work such as the cuing system, which Forsythe created as “an intricate network of dependency between the dancers by embedding the piece with hundreds of cues.” (Shaw 2014: 111). [Figure 2.1].

The term ‘choreographic objects’ was first proposed by James Leach, Sarah Whatley and Scott deLahunta in their AHRC-funded project ‘Choreographic Objects: Traces and Artifacts of Physical Intelligence’ (2008–2009). This project drew Forsythe’s projects into dialogue with three other choreographers and companies working on related digital outputs. The other ‘choreographic objects’ involved were Siobhan Davies Replay (2009), an online archive of choreographer Siobhan Davies’ work developed in collaboration
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with researchers at Coventry University, Italian/Dutch choreographer Emio Greco | PC (Pieter C. Scholten)’s *Double Skin/Double Mind*, (2007) an interactive installation developed in collaboration with the Amsterdam School of the Arts and the Choreographic Language Agent, a project emerging from the Choreography and Cognition dance-science research collaborations of London-based dance maker Wayne McGregor (2008). There are three key characteristics these ‘choreographic objects’ projects share: 1.) The aim to make explicit aspects of choreographic practice for others to access and study often via a form of publication; 2.) the varying (from simple to complex) use of digital technology; and 3.) their collaborative nature gathering together designers, editors, filmmakers, artists, programmers and other specialists. These characteristics are shared by other projects, therefore the concept of ‘choreographic objects’ assumes a more substantial connection to the documentation turn dance has taken in the past twenty years and have contributed significantly to the impact digital technologies have had on this. From this perspective, ‘choreographic objects’ can be seen to include Steve Paxton’s multimedia DVD-Rom project *Material for the Spine: A Movement Study* (2008), developed in collaboration with researchers, filmmakers and designers working for the Brussels-based Contradanse dance resource centre, and the series of book and DVD-Rom publications by Anne Teresa de Keersmaeker and Bojana Cvejić beginning with *A Choreographer’s Score: Fase, Rosas danst Rosas, Elena’s Aria, Bartók* (2012). While using low-end technology, mainly films of de Keersmaeker demonstrating and drawing choreographic principles on a blackboard while being interviewing from off camera, these publications explicitly aim to connect with the ‘choreographic objects’ projects of Forsythe and Greco.

With diverse artistic approaches as starting points, these ‘choreographic objects’ projects achieved the required levels of digital aptitude and expertise through forms of collaboration, cooperation and commission. The methods used drew on key research questions arising from practice, (e.g one of the questions Forsythe was asking was “what else might physical thinking look like?”), clear research frameworks involving iterative processes and the use of digital tools. These projects continued to bring dance artists and technology specialists together, working collaboratively and carrying on this relationship established in the ‘digital dance’ and ‘dance and technology’ projects of the 1990s. A very high level of digital aptitude, with perhaps
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the exception of de Keersmaeker and Cvejić’s publication, was integral to these projects, and in this regard they had resources for designers and programmers not easily available to others. This sometimes meant that software developed specifically for the project was not easily shared and entering or picking up where the project left off required equivalent levels of software expertise. Even these relatively high levels of resource could not assure long term sustainability with the result that components and platforms no longer run on current operating systems. Some of the research trajectories emerging from these projects, such as that involving annotation as we will discuss, take into consideration these core issues regarding technology development in relation to future digital methods for dance research.

2.1.3 Movement on the Move

Movement on the Move arises from a different perspective to ‘choreographic objects’. Bench and Elswit are motivated by their scholarly interest in the history of touring and how digital methods might enhance knowledge in this area. Movement on the Move comprises three research projects: Mapping Touring, Dance in Transit and Dunham’s Data. Each of these combines archival research, data analysis and visualisation using digital tools to track the geographical movement of dance such as Tableau Public, a free service for publishing interactive data visualizations on-line, and Palladio, a data-driven set of tools for analyzing relationships across time developed by Stanford University. Mapping Touring is the primary focus of this chapter. This project focused on the touring of ballet and modern dance companies in the first half of the twentieth century and resulted in three components: A Database, Map Visualisation and Route Visualisation. The development of the database itself was a critical step in the research process as it relied on existing archival dance material, mainly written records. Later in this chapter, we closely examine these three outputs, describing how they were enabled through digital aptitude which drew on methods comprising the right tools and strong research questions. We also discuss the nature of the unique insights offered to the study of dance history.

Despite arising from different motivations, ‘choreographic objects’ projects and Movement on the Move both share a concern with dance documents as diverse as customised recordings, existing films, written records, photographs, press cuttings and programmes. To develop both the ‘choreographic objects’ results and the maps and databases produced in Mapping Touring, these documents are processed to generate data, which is then structured and analysed. Their research frameworks make use of iterative processes, involving several stages during which the information from the document is extracted, ordered, analysed and re-presented, with results often folded recursively back into the next research phase. Although motivated by artistic and scholarly research concerns rather than dance preservation, both ‘choreographic objects’ and Movement on the Move highlight aspects of the documentation turn. The way that documents are processed, generated and (re)contextualised sheds light on their value for the understanding of dance and implies that dance cannot be disentangled from its record, mainly written records. Later in this chapter, we closely examine these three outputs, describing how they were enabled through digital aptitude which drew on methods comprising the right tools and strong research questions. We also discuss the nature of the unique insights offered to the study of dance history.

To add another perspective, performance scholar Toni Sant has published an edited volume titled Documenting Performance: The Context and Processes of Digital Curation and Archiving (2017) in which documentation refers to “the process of storing documents and preserving them in a systematic way for long-term access through an archive” (1). For Sant the distinction between documentation and document is critical as it draws attention to “what happens and needs to happen when a document is created.” (1) While the examples we discuss in this chapter are not archives in the conventional sense of the word, the projects are aligned with Sant’s concept of documentation due to the way that they work with and re-organise documents to shed new light on their meaning and relevance. This understanding of documentation as part of a process, rather than an individual record, also draws attention to the labour and skills involved in these projects, which are motivated by pertinent questions about the potentials of technology in relation to dance and involve skills in gathering and organising data, the kinds of skills that constitute what we are referring to here as ‘digital aptitude’.
2.2 Annotation: Collecting dance data from practice

The ‘choreographic objects’ projects described already emphasised the idea that choreographic principles could be made more “visible as explicit traces” (deLahunta 2013: 176) using computer-aided design. Some of this was achieved through graphic visualisation, drawing dynamic lines and curves on top of digital video recordings to demonstrate improvisational ideas or indicate structural relationships in the choreography [Figure 2.1]. To achieve this in the Synchronous Objects web-based project of William Forsythe, data was extracted manually by asking the performers to comment on the video recordings they were themselves in. They were asked to explain certain dance units, naming them, identifying where they started and stopped (Forsythe and Shaw 2009). Once this information was collected and converted into machine readable data, software such as Processing was used to generate new visual forms that reflected the underlying choreographic structure, recalling Forsythe’s original question regarding “what else can physical thinking look like”.

In another high-profile example from the Motion Bank project with American choreographer Deborah Hay, Amin Weber, a digital artist using tools for 3D digital cinema created a high-resolution film animation based on Hay’s written score No Time to Fly [Figure 2.2] (see Vincent et al 2018). In the final on-line presentation of the results of this research, the animation is linked to the relevant parts of the written score, which plays alongside the film. In another example of linking the time of one “digital object” (see Hui 2016) to another, small interactive animations are triggered by the figure of the performer (Jonathan Burrows or Matteo Fargion) recorded on video, or other sources from YouTube, offering an insight into how they work with patterns in a particular way in their performances. In each of these are examples of annotation of time-based media, the unitisation of the Forsythe recording, linking between Deborah Hay’s written score and the film animation and playback of one digital object triggered by another. For each, the aim was to use computer-aided design to reveal something about the unique artistic approach, not possible without the use of digital technology.

Figure 2.2 Still from animation by Amin Weber based on Deborah Hay’s written score corresponding to the Mend the Road section of the performance

Source: Motion Bank

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Crucial to our discussion of digital methods in relation to dance studies, the annotation processes for these projects involved human observation and decision taking (what to mark and how) which further demonstrates how digital methods require more than just the adoption of digital tools. As part of an iterative design framework, the annotation generated new data recorded in a corresponding form; e.g. an Excel sheet, or using a custom-built software for recording the annotations directly to the playtime of the digital video. The machine-based linking from one digital object to another relies on standards and data models (see deLahunta & Jenett 2016), but the manual annotation of dance recordings as described above resists the application of standards. These manual annotations made as a part of these projects corresponded to particular perspectives and approaches, for example, Deborah Hay’s annotations marked the start of each part of the written score sequence. The annotations for Synchronous Objects corresponded to the three different parts of the overall choreographic system (Forsythe and Shaw 2009). In both cases, performers in the video made or validated the annotations. General annotation approaches have yet to materialise in dance practice and research. While digital video recording devices have become ubiquitous in dance creation and rehearsal contexts, the practice of video annotation currently has no such foothold in the professional field. Dance focussed software development to date only goes so far as to speculate about the possible benefits of video annotation. In the sciences, a field like cognitive linguistics has been using video annotation for behavioural analysis (see Elan and Anvil20), but this kind of systematic research involving video analysis is not integrated into the culture of dance practice and scholarship, although there are exceptions.21 Several dance education institutions, such as Trinity Laban in London, have expressed interest in annotation due to the integration of commercial streaming media services such as Planet eStream into their IT systems. These video services provide annotation tools, but the lack of extant methods of annotation practice means the schools are not using them.22

The only professional dance company to date to regularly use video annotation has been The Forsythe Company (TFC). The tool they used was called ‘Piecemaker’ a web-based application originally developed by company performer/collaborator David Kern for annotating video recordings of the creation process of new works of TFC from 2008 to 2014. Piecemaker was used for recording video and dramaturgic notes simultaneously, live, during rehearsals and automatically linking the two (Vass-Rhee 2019). In 2010, the Motion Bank project took over the development of this software application (applying it to the previously described ‘choreographic objects’ with Deborah Hay and Jonathan Burrows & Matteo Fargion) and continues to develop it today. It was the application used to support the creation of the on-line digital scores already mentioned, e.g. for annotating Deborah Hay’s No Time To Fly (2010). Following the end of this first phase of Motion Bank in 2014, the aim shifted toward a full rewrite of the software to be low-threshold (easy to use), standard-compliant and open source designed for use in a variety of contexts, including dance education, creation, research and archiving. Standard compliant refers to the new W3C annotation standard published in February 2017, which offers insight into longer-term goals for the accumulation of annotations as dance data. Complying with the W3C standard will facilitate future digital pattern searching and discovery, support code sharing and enhancement, and contribute to the long-term sustainability of the software.24

In addition to the design and development of these systems, Motion Bank is engaged in on-going methodological research into the practice of annotation. There has been no empirical research undertaken specifically regarding the lack of extant methods for annotation in dance practice and research, but it may have different causes. One reason might be the position it imposes on the viewer to assume an analytical perspective and position fixed visual reference points relative to the experience of continuous flow valued in dance. It may also relate to tensions regarding an assumed difficulty in using verbal language to describe movement. In this regard, what is emerging is a new concern with the concept of dance vocabularies alongside these annotation forms. This has a very practical basis; the aim is to enhance a recording of dance by naming, tagging and/or describing events taking place at the precise time they happen. Dance vocabularies themselves are not new. They are already part of practice. They exist or emerge as an augmentation or aid to the dance experience, for example terminology used in training or rehearsal situations.25 Vocabularies can constitute a shared conceptual framework the dance takes place ‘inside of’. These vocabularies often, but
not always, make use of metaphor. They can be descriptive or associative, “as a trigger for the imagination” (deLahunta 2015: 253). Other disciplinary lexicons might infiltrate and influence how these vocabularies evolve. These are not so-called ‘movement’ vocabularies, but are words, expressed explicitly in verbal or written form. They intersect with tacit understandings in unique ways and can be associated with the transmission of embodied knowledge. A key question now is to what extent these vocabularies might be used in annotation. What forms do they take, how much more classification structure or consistency is required? How do these vocabularies change when harnessed (as data) to mediated versions of the live experience?

There are currently more questions than answers, but here we wish to draw attention to the potential of digital methods for the study of dance emerging from the field of practice, with clear overlap with scholarship. This has much to do with the digital technology underpinning a major increase in the amount of on-line streaming video of dance. In March 2012, the renowned French choreographer Jérôme Bel took part in an interview for Tate Live: Performance Room during which time he made the following statement “YouTube is very important for the performing arts because it’s our first library, it’s our first data (…) it’s a new world for the performing arts.” That was 2012 and now it is 2019. Streaming video numbers are simply staggering, the current Google answer to the question of ‘how many videos are uploaded per minute’ is 300 hours (60 hours per minute in 2012), with 5 billion videos watched every day. Services like YouTube and Vimeo are used increasingly by choreographers world-wide to distribute and communicate recordings of their works. Bel’s unstudied comment is a reflection on this new information distribution space for dance, one that is more accessible to a greater number of artists than many of the approaches used to publish the high-profile interdisciplinary research projects already discussed. What is required is an annotation tool for dancers that is sustainable, open source, interoperable, persistent and free. This then needs to be adopted by the professional and scholarly dance community, who are willing and interested to explore the kind of ‘manual’ vocabulary creation required to generate annotations than can link to other annotations, that are searchable and discoverable.

Motion Bank aims to continue the development of Piecemaker (now in its third version) to use in documenting and transmitting tacit, collaborative and embodied forms of knowledge and bringing these this into alignment with research into linked data, semantics and ontologies from information science. The view of some researchers (including Motion Bank but also other efforts in Athens, Lisbon, Zurich) is that there is a link between dance vocabulary, annotation of time-based dance recordings (2D and 3D) that someday may generate the kinds of dance data that can be probed computationally, that can be scanned for unseen patterns and connections. However, now we don’t know if or when this development from within the professional and scholarly dance community might happen, or if even such a collective effort involving the digitisation of practice is appropriate given other socio-political questions regarding data privacy, regulation and usage. Individual, unique collaborative projects continue to evolve, e.g. the recent Motion Bank collaboration with Finnish choreographer Taneli Törnä, but the software development challenges are significant and not well understood by non-developer communities, which includes most cultural and research funding organisations. And a lack of resources remains a challenge for other on-line dance publication projects, even when developed to be sustainable such as Oral Site running on an open source and free software called Olga. These challenges make the following reflections on the Movement on the Move research especially interesting, as the scholars involved were less restricted by issues of software development but could build their questions because of their ability to manage the software aspects themselves.

2.3 Mapping touring

Movement on the Move is a collaborative project between Bench and Elswit, which arose from a recognition that they were individually exploring how digital methods could provide insight into the nature of dance touring (2016: 577). Elswit’s previous work was concerned with considering how digital methods might “tackle the particular historical problem of tracing dance’s complex global networks and infrastructures”
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(Bench and Elswit 2016: 577) and she had been experimenting with how visualisations might enable better understanding of dance’s circulation. Bench, on the other hand, had started to look at touring as a way to “historicize dance’s screen-based transmission”, building a series of datasets to track touring activities (Bench and Elswit 2016: 577). Both scholars therefore had digital aptitude before they began their joint venture. Together they aim to develop:

A broad account of how, why, and by what means dances travel requires that scholars attend to the lived, day-to-day experiences of multiple bodies, together with the financial, technical, and political infrastructures that support such movement moving. (2016: 577)

In order to do this, they created a database about the touring activities of Anna Pavlova’s company during World War One and American Ballet Caravan’s tour during World War Two by cataloguing archival data. The cataloguing of this data allowed easier and more in-depth analysis than was possible working with archival material alone. Bench and Elswit suggest that, “The power of the digital database lies in the standardization of data, which facilitates access and usability, and its ability to manage datasets of whatever size.” (2016: 583). The process of extracting information from the archival records and organizing it into the database links to Sant’s point about documentation as a process, rather than merely a record. While the documents are likely to have been organized in a conventional archive when Bench and Elswit accessed them, their process of re-organization or ‘documentation’ allowed for new insights into the records, thus reiterating the idea that it is through the process of organisation that the record becomes part of the documentation of dance (Sant 2017:1).

Bench and Elswit describe how the process of organising the data and developing the visualisations in their shared work allowed scholarly insight into the cultural and political contexts of the tours. They suggest, “Digital research methods can work in tandem with more traditional scholarly ones to manage the scale of data truly necessary to model traveling dance in terms of what we call “dynamic spatial histories of movement”’ (2016: 575). These outputs are not intended solely to share information with other scholars, but the process of making them is itself research. For example, Bench and Elswit draw on Richard White to describe the visualising spatial history as a means of doing research (2016: 582). In this way, Movement on the Move aligns with Motion Bank’s annotation processes in that both projects are driven by curiosity about what digital methods can offer our knowledge of dance. While Motion Bank and other ‘choreographic objects’ have been primarily motivated by questions arising from dance practice, Movement on the Move is motivated by the scholarly concerns of researchers. In both cases, key research questions and iterative frameworks support the specific digital tools being deployed.

Mapping Touring, was the first in the series of projects that comprise Movement on the Move. It was led by Bench, who used data about the touring activities of nine ballet and modern dance artists and their companies to develop a searchable database and two visualisations; one static Map Visualisation map and a Route Visualisation which traces the routes the companies travelled. All three of these outputs are available on the Movement on the Move website. Bench and Elswit suggest, “In the case of dance touring, the scale of digital analysis, particularly organized as a database and represented as a map, expands our capacity to trace real and potential networks of relation” (2016: 582). How then might the visualisation of spatial histories inform the thinking of other scholars? Bench and Elswit’s acknowledgment of the tracing of ‘potential’ networks seems particularly relevant when encountering the Mapping Touring maps without prior knowledge of the touring activities of the company or access to detailed records of their experiences. Viewers can draw on their individual knowledge of the cultural and historical context of the period to imagine why the companies might have visiting the places they did as well as those places missing from the tours. This hypothetical analysis offers a form of insight which is based partially in historical facts about the places and dates of performances, represented in the visualisations and partially in the imagined logic motivating these decisions. This type of analysis might stay at the level of hypothesising or else become the starting point for
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more in-depth historical enquiry. Either way, the space for imagining potential networks and motivations offers a way in to thinking about the topic that might generate new research.

The way that the geographic movement of the companies is represented on the visualisations raises questions about the relationship between bodies, space, place and movement. The Map Visualisation [Figure 2.3] offers a static representation, indicating the positioning of people. Viewers can select the time period they wish to study (between 1890 and 1970) using a sliding scale on the left of the screen. Moving between different time periods allows viewers to see the emergence of clusters, where companies converged in states and cities during the same year. For example, selecting 1920 one can see how Ted Shawn and Ruth St Denis's companies moved around each other as they travelled the United States, almost converging on the Californian coast. Zooming out allows us to see how companies travelled beyond the United States, to South America, Europe, India, Asia and Australasia. Notably, during the entire period mapped, not a single company performed anywhere in Africa, Russia, the Middle East or Scandinavia. The ability to visualise which geographic regions were and were not included in touring activities sheds light on the potential political and diplomatic relations at play during the period.

While the act of touring is necessarily transient, the static nature of the representations created through the Map Visualisation draws attention to the situatedness of performance events within specific times and places. One can start to imagine the experiences of the performers arriving and performing in each town or city. On the other hand, the Route Visualisation [Figure 2.4] offers animated renderings of the routes of each company. Reading the history through moving lines, with dots representing each performance draws attention not to specific places but to the way that bodies move through space. Viewers can select the time period, from the same range as the Map Visualisation, and which companies they want to track. As the animation plays, a counter indicates the date of the performance being represented by the dot and whether it was an evening performance or a matinee. The visualisation and counter move quickly, but viewers can pause the action using a button on the left of the screen. As with the Map Visualisation, one can zoom into a country, continent or region, or zoom out to watch the way that the companies toured the world.

Figure 2.3  Screengrab from Map Visualisation. https://mappingtouring.osu.edu/visualization/map
Source: Harmony Bench & Chris Britt
The Route Visualisation offers another reading of the body’s relationship to space through the abstraction of the movement of the body. It is the body’s mobility through transportation that is inscribed, as opposed to the specific movement of the body. The renderings used in these maps simultaneously foreground and abstract place. They draw attention to the sites of performances, but the renderings are abstract and the visualisations detail countries and states or regions but not specific towns or cities. Zooming in to each site of performance the dot which represents the visit is partially situated in a specific place and partially suspended in digital ‘no place’ (Bench 2008). Human geographers draw a distinction between space and place, with space considered abstract and place understood as lived in, meaningful and “shaped by the activities and perceptions of its users” (Isomaa et al 2013: ix). In creating ‘spatial histories’ through digital media, place is rendered abstractly and therefore replaced by space.

In relation to the ways that bodies travel through digital ‘no-place’ Bench writes, “In digital media, no-place lubricates the transition among places by erasing the act of ‘getting there’” (2008: 43). The Route Visualisation is a reversal of this erasure, by foregrounding the act of travel, yet the abstraction of the body and geographical markers do not render the body in relation to places. This part of the enquiry, to situate the specific bodies of the performers in places full of cultural and historical markers is down to those engaging with the maps. Returning to Bench and Elswit’s articulation of ‘imagined networks’, we can see how the role of the imagination might play a significant part in the viewers’ engagement with the visualisations and their ability to gain insight into the maps.

Although these visualisations are offered as ways to conduct historical enquiry and are based in factual evidence derived from archival materials, they offer more than simply historical data. They also provide a way into thinking about the particularities of these bodies as they travelled through and performed within geographical places. This thinking depends on the imagination and knowledge of the person using the map, combined with the data that situates the dancers. This imaginative and intellectual work required on the behalf of the viewer is shared with the ‘choreographic object’ annotations. For example, the lines drawn on top of the Synchronous Objects video [see Figure 2.1] are derived from specific data about the cues passing between the dancers. However, the shapes generated through the visualisations do not immediately

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Figure 2.4  Screengrab from Route Visualisation. https://mappingtouring.osu.edu/visualization/route

Source: Bench & Elswit
offer deeper insights into the knowledge that is meant to be transmitted here. The viewer needs to go through their own process of analysis, deconstruction and study of additional contextual information included on the website in order to understand the relevance of the annotations. Both of these projects therefore demonstrate how outcomes of the documentation turn which treat documentation as a process and intrinsic part of our understanding of dance offer ways of articulating aspects of dance that move beyond didactic forms of articulation, in turn provoking processes of analysis and imagination in the viewer/researcher.

Conclusion

We have discussed so far two areas of enquiry which share some features but began very differently and had very different planned outputs. One has emerged from the artistic field, has a relatively long trajectory and often involved large interdisciplinary teams, the other a smaller scale, but clear effort emerging from dance studies undertaken by two academics. However, despite these differences, the ‘choreographic object’ projects and Movement on the Move arise from similar questions regarding the exploration of digital technologies to understand more about dance. They also both undertake similar processes of generating, re-structuring and recontextualising data pertaining to the documentation of dance, demonstrating key aspects of the documentation turn. Considering them alongside, we can see how there is a continuum between artistic practice and scholarly research. Whichever service, tool or platform is used, whether Piecemaker, Tableau or Palladio, they clearly do not offer digital methods in and of themselves. It is up to the individual scholar to develop good research questions and an analytic framework that iterates rigorously through various stages, creating data from data with which to think through and with. Digital methods for the study of dance arise through the drawing together and combining of these different aspects. While there were dance analysis models and approaches developed in the 1980s (Foster 1986, Adshead et al 1988), these are no longer widely used, with scholars and practitioners often drawing on their own individual frameworks to analyse works and practices, echoing the idiosyncrasy we see in approaches to documentation. The outputs of these projects we have been describing here certainly appear different to non-digital forms of documentation, but the enquiries and ways of looking that underpin the outputs are only partially digital.

Movement on the Move demonstrates an experimental approach that can be adopted and adapted by other researchers and their datasets can be used to generate new visualisations. The potential of Movement on the Move to shape new thinking in the field echoes the development of annotation tools, which help practitioners and scholars to develop skills and experience in the digital annotation of movement, opening new ways of working with dance. From the perspective of the annotation efforts being undertaken by Motion Bank and others, there is clear interest in and motivation to aggregate annotation data that is structured so that it might be available to forms of computational analysis. However, in the context of dance studies or scholarship, there are no effective examples to date demonstrating the value of such an approach. This may be in part because the field has not the same kinds of born digital resources that much of digital humanities focuses on, collecting and analysing data from computer networks or accessing already digitised archives and collections through their APIs. This is one of the reasons we have combined the two areas of enquiry, both involved with data creation. However, as we have emphasized from the start, digital methods for dance study involves more than just access to more data. The work of Bench and Elswit demonstrates that a very tight connection between clear questions, research design frameworks, available resources, manual labour, aptitude for and willingness to learn specific digital tools and a vision that sees the potential is essential. Their example shows there is no need to wait for more data sources. And in the future, as Motion Bank and other annotation platforms seek to stabilise and find resources for a sustainable development, we look forward to dance scholars who have instinct, rigour, openness, digital aptitude and curiosity availing themselves of the research opportunity presented by annotation data.
Digital aptitude

Notes

1 The 1990s in particular saw a number of organised labs and workshops e.g., Terry Braun’s annual Digital Dancing workshops 1994–1998 in the UK and a series of Dance and Technology conferences hosted by the University of Wisconsin (1992), Simon Fraser University (1993), York University (1995), and Arizona State University (1999).

2 For example, since 2015, the International Federation for Theatre Research has convened a Digital Humanities and Theatre Research working group. There is nothing equivalent for dance.

3 Eg. the work of Gibson/ Martelli: https://gibsonmartelli.com/, William Forsythe’s Black Flags robot choreography: https://www.youtube.com/watch?v=0XVrrmn9jno and Wayne McGregor’s work with AI: https://www.wired.co.uk/article/google-ai-wayne-mcgregor-dance-choreography


5 As described in the Introduction to: Blades and Meehan (eds.) Performing Process: Sharing Dance and Choreographic Practice. And see for example, ‘What’s the Score? On Scores and Notations in Dance’ http://olga0.oralsite.be/oralsite/pages/What’s_the_Score_Publication/

6 The use of the term ‘Choreographic Objects’ throughout this article is distinct from use of the term by William Forsythe to refer to a series of artworks he has been developing for several years. https://www.williamforsythe.com/

7 Motion Bank Phase One (2010–2013) was a research project of The Forsythe Company focused on creating unique on line digital dance scores with guest choreographers including Deborah Hay. http://scores.motionbank.org/dh/. The three dance artists involved were Jeanine Durning, Ros Warby, Juliette Mapp.

8 Motion Bank Scores: http://scores.motionbank.org/jbmf/#/set/sets


10 An early project Video Traces developed for dance education in the early 2000s (https://web.archive.org/web/20080321182857/http://depts.washington.edu/p ett/projects/video-traces.html), and Rotosketch (https://web.archive.org/web/20070429232234/http://thesystemis.com/rotosketch/index.html) and more recently DancePro (https://www.europeana-space.eu/dancepro/) continues this line of developing a tool for drawing on top of video. But the fact that tools have been developed does not mean they are taken up in practice more generally.

11 Trinity Laban offers guest access to selected videos via Planet eStream: https://estream.trinitylaban.ac.uk/

12 For a report on annotation research with Codarts, a dance education school in Rotterdam see: https://medium.com/motion-bank/developing-vocabularies-for-dance-education-e4c4584950a8

13 https://www.w3.org/blog/news/archives/6156. ‘It will allow anyone to annotate anything anywhere, be it a web page, an ebook, a video, an image, an audio stream, or data in raw or visualized form. Web annotations can be linked, shared between services, tracked back to their origins, searched and discovered, and stored wherever the author wishes; the vision is for a decentralized and open annotation infrastructure.’

14 Pre-choreographics Emio Greco | PC, an exemplar for vocabulary development: https://pre-choreographieelements.net/

15 As the “keen interest in developing modes of documenting, arching and transmitting contemporary dance” emerging in Europe (de Keersmaker and Cvejić 2012: 7).

16 The use of the term ‘Choreographic Objects’ throughout this article is distinct from use of the term by William Forsythe to refer to a series of artworks he has been developing for several years. https://www.williamforsythe.com/

17 Motion Bank Scores: http://scores.motionbank.org/jbmf/#/set/sets


19 An early project Video Traces developed for dance education in the early 2000s (https://web.archive.org/web/20080321182857/http://depts.washington.edu/p ett/projects/video-traces.html), and Rotosketch (https://web.archive.org/web/20070429232234/http://thesystemis.com/rotosketch/index.html) and more recently DancePro (https://www.europeana-space.eu/dancepro/) continues this line of developing a tool for drawing on top of video. But the fact that tools have been developed does not mean they are taken up in practice more generally.


21 Including; dance unitisation for Synchronous Objects facilitated quantitative analysis, e.g, https://synchronousobjects.osu.edu/content.html#/StatisticalCounterpoint; Carla Fernandes’ BlackBox http://blackbox.fosh.unl.pt/.


23 Motion Bank Scores: http://scores.motionbank.org/jbmf/#/set/sets


25 Pre-choreographics Emio Greco | PC, an exemplar for vocabulary development: https://pre-choreographieelements.net/

26 As recently funded and one of the only ‘digital humanities’ and dance projects by the National Endowment of Humanities explicitly makes this point: https://www.ua.edu/news/2018/12/professor-to-strengthen-digital-humanities-in-education-a-conversation-on-motion-bank. (deLahunta and Jenett and Cramer 2015).

27 Jerome Bel – BMW Tate Live: Performance Room (22 March 2012): https://www.youtube.com/watch?v=0TmUQmKpDg

Hetty Blades and Scott deLahunta

30 Between Us is a cooperation between Motion Bank, a research project of the University of Applied Sciences Mainz, the Kunsthalle and the Staatstheater Mainz: https://betweenus.motionbank.org/#/
31 Oral Site is a platform that exists as a project space to support digital artist publications: http://oralsite.be/pages/Index
32 Obtained from collections at the Jerome Robbins Dance Division at the New York Public Library, the Jerome Lawrence and Robert E. Lee Theatre Research Institute at Ohio State University, the New York City Ballet Archives, and the Rockefeller Archive Center (see Bench and Elswit 2016: 577).
33 The ways that historical embodiment can be foregrounded in visualisations and datasets is an area that Bench and Elswit are continuing to explore in their current project Dunham’s Data: https://www.dunhamsdata.org/

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Hay, D. (2010). No Time to Fly [dance work], premiere St Mark’s Church in-the-Bowery, New York, 25 March


