

Computer-Based Synaesthesia and the Design of Complex Methods to Approach Multimodal Realities of Dance and Music Through Technology. An Interview with Alexander R. Jensenius, Deputy-Director of the RITMO Centre of Excellence of the University of Oslo

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Sinestesia computacional y diseño de métodos tecnológicos para una aproximación a la danza y la música como realidades multimodales. Entrevista a Alexander R. Jensenius, Subdirector del Centro de Excelencia RITMO de la Universidad de Oslo

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ABSTRACT

After producing ground-breaking computer-based tools to advance the study of human movement, such as the video-visualization techniques contained in the Musical-Gestures Toolbox, Alexander Refsum Jensenius has continued to find more creative and analytical possibilities to intersect our understandings of music and dance. In the current context of technology-assisted misappropriation of traditional songs and dances, I interviewed the Deputy Director of the RITMO Centre on how we might revert the link between new technologies and intangible cultural heritage for the benefit of legitimate bearers.

Furthermore, in this interview, Alexander outlines the embodied and interdisciplinary approach towards music that has grounded the course of his career but even more interestingly, he offers insights about the future of experiencing dance through technology and the possibility of dancing robots.

KEYWORDS

Embodiment, Interdisciplinary Research Methods, Technology, Intangible Cultural Heritage, Dance.

RESUMEN

Tras haber producido innovadoras herramientas para profundizar el estudio del movimiento humano, como las "Técnicas de observación de video" contenidas en la Toolbox Musical Gestures, Alexander Refsum Jensenius no ha parado de revolucionar las posibilidades creativas y analíticas para aproximarse a la danza y la música. En el contexto actual de apropiación cultural ilegítima facilitada por herramientas tecnológicas, entrevisté al Subdirector del Centro de Investigación RITMO respecto de cómo redireccionar el rol de las nuevas tecnologías para la protección del patrimonio cultural intangible.

Adicionalmente, en esta ocasión, Alexander rastrea el enfoque interdisciplinario y corporeizado que ha enmarcado el curso de su carrera, pero de manera aún más interesante, ofrece reflexiones prospectivas respecto de la experiencia de la danza anclada a nuevas tecnologías, la salvaguardia de la cultura y la posibilidad de un robot que sea capaz de danzar.

PALABRAS CLAVE

Corporeización, métodos de investigación interdisciplinar, tecnología, patrimonio cultural intangible, danza.



Alexander Refsum Jensenius¹ has been working for the past 20 years to interpret *music* as an embodied phenomenon through technological developments in the field of Computer Science and Robotics. His cross-disciplinary approach expands methods to see music and to *hear* the human movement while revealing the interconnection between these fields. The continuous intersections that he finds between creative and analytical tools have enhanced the quantitative and qualitative scholarship of multi-modal realities (events wherein music, dance, and music-related movements are present and intertwined). This approach has been accompanied by an ever-present concern of broadening access to educational systems, which has led Alexander to disseminate his findings beyond his profuse academic publications. By using an array of platforms, including GitHub, YouTube and free web-based courses, Alexander's work sets the tone for the contemporary scholar as someone who continuously asks *what else* can be known about music and dance while never ceasing to think *who else* can be part of such discussions. Alexander is an Associate Professor of Music Technology at the University of Oslo and the Deputy Director of the RITMO Centre of Excellence (Interdisciplinary Centre for Studying Rhythm, Time and Motion).

¹ More about Alexander Refsum Jensenius at: <https://orcid.org/0000-0001-6171-8743>.

Jorge Poveda Yañez: As a way of framing this conversation, I want to refer to four current legal cases regarding the video game Fortnite². In this popular video game, there are emotes or dance movements offered to the users as a reward for spending hours playing. These movements, however, were not created from scratch. Instead, they have been taken from pop culture and folk dances, and therefore you will find movements ranging from Russian dances to the flossing, the internet viral³. Four persons are complaining because they claim to be the creators of the movements present in a video game that failed to give them financial or moral credit. The conflict is generating a major controversy in the US due to its complexity and the ramifications that could derive from granting property rights over single movements. Choreographies have been copyrighted in the past, but not single movements. Because of your experience within the Digital Humanities Research Network, what is your opinion about the potential that technology has for people to engage in new ways with traditions, folk dances and cultural heritage in general, considering the challenging situations arising such as the one described?

Alexander Refsum Jensenius: In the field of dance and music, which is my area of study, you can think about it in many different stages. Media-oriented and technology-based resources can help in producing art in the first place. If you talk about preservation and archiving, this can be assisted too by technological tools through dynamic metadata, producing cross referential insights of the material. But when it comes to the actual content of the recordings, (in the case of dance) you can inspect them from a quantitative perspective. New technology can help you visualize things, which is what I have been working on by producing motion history images, motiongrams, centroid of motion reports and the like⁴. We have also been working to extract some features of the recordings within archives both for preservation and retrieval, to offer more dynamism to any effort to analyse such data. In Norway, we worked with the Folk Music Collection at the National Library with Olivier Lartillot (post-doc fellow at RITMO) in methods to extract different types of features from the musical sound and then use them to retrieve more effectively the data through gestural controllers. By using this tool, you can simply move your body in a particular way while holding a phone, and the app that we designed will retrieve the music that best matches your movement, thanks to the accelerometer present in almost every smartphone. You could eventually do this with dance, but you would need to have a kinetic database first and then use the same phone and technology to retrieve the most similar movement pattern in your archive.

JPY: Have you found, through all the explorative and experimental projects that you have led, resistance from the people concerning the negative consequences of changing the traditional ways in which we engage with dance and music?

ARJ: When we first started the Sound Tracing Project, which is the project done in the National Library, there were several people questioning our motivations for doing this. The argument was “why can’t we just trust the way in which we have been retrieving the files in the database until now?”. But on the other

² Available for download at the official website of the developer: <https://bit.ly/3mdKXIh>.

³ For a discussion about the flossing in the context of the video game Fortnite see: <https://nyti.ms/2ZtCbGq>.

⁴ See footnote 2 for visual examples of these reports.

hand, once people got to experiment how to find files by simply moving their phones, they really got excited. We are talking about thousands of recordings constituting this massive database that, as rich as it can be, it also posits the risk of being uneasy to navigate. The challenge is that among people working in the arts or the humanities there is a common perception that all of this is just science fiction, just because it is a different way of thinking that they are not used to. That is why I deem it important to bridge the humanities and technology so that we can come to the realization that using technology does not mean reducing the content of things to plain numbers, instead it is a tool that we can design ourselves to better navigate our data. This relationship will be as good as we make it, but then you need to build the knowledge to know how to match the needs of the humanities and the potential of technology.

JPY: In this same way, I have experienced first-hand the resistance or suspicious gaze about using technology in fields such as the anthropology of dance or ethno-choreology, wherein great efforts have already been done to study and notate dances. For instance, you have all the impressive work done in Eastern Europe in countries like Hungary when it comes to traditional folk dance. But I do think that we still need innovative tools to know what to do with it and make the most out of the research, effort and time invested. What is the biggest concern that you have had while implementing these technology-based initiatives?

ARJ: We have this Music-Lab Series, which is a public event where we perform data collection for research, but anyone is invited to assist. I am very much trying to go in the direction of open research to make these processes as open and accessible as possible. Nonetheless, we have faced a lot of problems concerning copyright, legal and ethical issues, especially involving videos or recordings that need to be produced and kept according to rules that can be seen as constraining but are in place for protecting people and their interests. This is something that I and all the RITMO team considers.

JPY: I am asking you this because last year I found out about an amazing project which involved the use of motion capture technology to create a platform for people to learn traditional Hungarian dances. I was impressed not only by the idea, but also for the amount of backlash that it received from people and specialists of the field of dance. The argument was that it was concerning, to say the least, to introduce computer mediation to an activity that used to be based on human interaction. I would love to hear what your opinion on that is.

ARJ: Now things are easier but still working with music and technology is something that many people find odd. There has been more awareness and exposure to projects that merge technology with music than those involving dance, but the scepticism is still there. It is, of course, good to have a certain resistance because it can help us to maintain a balanced view as we reconsider what it is that we develop from the field of technology. Such counterbalance is healthy. All the work that I have been involved with aims to connect humans with technology instead of separating them. It excites me to see how a lot of our projects change the perceptions people have about this relationship so that we can start benefiting from such complementarity.

JPY: You already brought to the discussion the distinction between using technology to create or as a tool to safeguard cultural expressions that have already been produced. I know that you have an extensive background with the creative purposes of technology. However, have you been interested in the issues of cultural heritage protection and safeguarding?

ARJ: Well, most of the things that we have been doing in the lab are devoted to technology that can be used for safeguarding, and also to advance the methods to analyse data that accounts for multi-modal realities. In the case of dance, as you know, when you do a video recording, the use of a camera is still a good method, to a certain extent, but doing motion capture recordings is something different. There is a complementarity of methods rather than a discussion on which method is the best. That is precisely what we are working with at RITMO. A complex reality demands complex methods to account for it. An example of this is an artistic event wherein music, dance and music-related gestures are intertwined. If you only do a video recording of a dance, the result can flatten the movements for the bi-dimensional constraints of the medium employed. For the safeguarding of cultural heritage, it is not enough to turn a regular camera on. What I find interesting is that even if you have the information about the movements performed, the ways in which they are done can drastically change their meaning. An analogy would be to consider that a midi file taken from a musical melody does not fully render the expressive qualities varying across different performances of the same composition, and I do believe that they should be taken into account too.

JPY: In the context of my current research, I am trying to explore the connections between technology and intangible cultural heritage. And there is something about this link that certainly exceeds the field of cultural studies. Do you think it is worth considering the connection between the set of sensibilities that people use to perceive music and dance with the technological medium employed to experience them?

ARJ: Absolutely, I think so, and this link encompasses cultural as well as biological aspects.

JPY: In that case, would it be fair to say that safeguarding strategies that involve new technologies could produce a new cultural substance or expertise that can be employed to further elaborate conclusions in the fields of psychology of perception or cognitive science?

ARJ: It is always important to keep thinking about the interdependence of culture and nature. And I definitely think that the work we are doing here at RITMO encompasses both fields. The current book that I am working on explores the different cognitive experiences that people have while using either acoustic or digital instruments. I believe that there is a fundamental cognitive difference when using acoustic instruments that require a certain amount of physical effort to produce sound. Whereas, if you are playing an electric-acoustic instrument (digital), there is a mapping that is designed by someone and therefore the connection between the action and sound is arbitrarily made. Such interconnection is what I call action-sound coupling. I want to see what are the biological as well as other types of changes that might be happening in our brains due to the interaction with such new ways of producing musical sounds.

JPY: Why has it been relevant for you to approach music and movement in this interdisciplinary way?

ARJ: That is a good question. Well, I have a very interdisciplinary background. Even before my academic training. Combining different things has been with me from my childhood in many ways. But I guess now I really do not see any other way in which I could answer the questions that I have, therefore, here lies the reason why I became interested in the body in relation to music. This is a combination we are getting used to, but 20 years ago, very few people were working on this. Studying music used to mean reading scores, that was it. I became interested in listening to music; and moreover, I wanted to analyse musical production, which was fairly new at that time. At some point, I realized that hearing sounds was just a part of this process. The phenomenon of music is also very much about a bodily experience. To be able to understand my feelings and experiences with music I needed to redirect my interest to my own body. Afterwards, I started working with dancers and interacting with them to do music with their bodies through sensors placed onto them. I found this very fascinating from the artistic side; but furthermore, once I started my PhD, I decided to implement this approach from an analytic point of view as well. Creating a meeting point between dancers and musicians through technology I think is a beautiful and fruitful decision.

JPY: The very last question is related to something you already mentioned when you explained the ideas for your upcoming book. The link between music and technology, along with its promising possibilities, has been increasingly explored over the years. Looking towards the future of dance, how common do you think it will be to experience movement mediated by technological resources?

ARJ: I am thinking about robots. The idea is extremely appealing. Robots need to move and if you want them to do so, you need to design a kind of choreography for them. Furthermore, working with robots is similar to working with synthesizing sounds. It is not always that the result is particularly interesting; but for example, to be able to synthesize a sound you need to understand what the sound is about, its shape and its content. It is the same if you want to have a robot moving in a meaningful way, resembling a dance. You can tell there are not a lot of good dancing robots right now, but if you want to make them dance, you will need to be able to explain and write the movements you expect them to perform in code. In order to do that, you need a lot of analysis of human movement. I think that is a fantastic future to have robots moving in a way that is aesthetically relevant. If we manage to do that, without the need of actors providing the kinetic material through motion capture (as with animation movies), then we will have solved a lot of problems that we still carry because we do not fully understand the complexities of what movement really is or how to produce it.