

Digital_Syzygies

Thu, Jan 05, 2023 12:35PM • 22:51

SUMMARY KEYWORDS

musicians, project, sounds, autistic, music, composer, brain, traditional, performance metrics, score, created, find, digital, differences, musical, quartet, combine, hearing, people, notation

SPEAKERS

Andrew Hugill

Andrew Hugill 00:01

Hello, this is a report on a case study project that was undertaken as part of a larger research project funded by the European Research Council. And the title digital synergies, the word Syzygy in this title refers to an alignment in the same way that you might find is for example, an eclipse where three bodies come into alignment. So the idea here is to find alignments between different musicians as we shall see. And the project used an EEG device and AI to create the music I thought I'd just start by planning you this brief video of what the thing looks and sounds like and then we can go into the detail of the project Asian? Okay so just to explain what's going on here, you can see in the image of me, in the bottom right of the video that I am wearing a headset. This is the emotive insight headset. And you can see on my forehead, there are two sensors, there are actually six sensors in total. Others are positioned behind my ear on the top of the hairs on the back of the head. And these sensors correspond to the graph that you can see on the left, and you see the six lines there that are labelled en E, X fo and so on. And these update every 10 seconds, giving an indication of my brain activity at that time. These relate to different aspects of the of the brain. So engagement, excitement, focus, interest, relaxation, stress, and the numbers that indicate the levels of each of those components. That output is then fed into a Python app, which you can see at the top right of the screen. And this is selecting sounds that have been pre analysed by my brain Seen as stimulating one of those six performance metrics, in particular. So the more engaging I find something, the more likely it is that a sound tagged with that element is going to be played. So what we have in effect is a feedback loop. The more my brain finds something exciting, for example, the more it will respond with excitement, until such time as it turns away from that, and chooses, let's say, to go into relaxation. And what we find typically when using this system, is that the brain will change direction quite frequently, and in its own way, often without reference to what we subjectively feel is going on. Instead, it follows its its own unconscious directives. Now, this infographic, of course needs no explanation to this conference. But I did want to pause on it just to explain how this project relates to aural diversity. As people may know, I've both got severe unbalanced hearing loss with tinnitus and Diplock uses, I'm also autistic. And so a lot of my creative efforts over the last 10 years or 15 years or so, have been directed towards trying to accommodate those differences in my creative work, and indeed, deal with them as part of the creative work. So one of the consequences of my hearing differences is that I find it very uncomfortable, even painful, to listen to music for very long. And so many of the traditional ideas about musicianship

become irrelevant or outmoded, or challenged, severely challenged in this kind of situation. So, for example, the idea that one should listen to one's instrument, and be in control of your sound. These are things that I really find myself most of the time pretty unable to do. That is using my conscious mind and my hearing apparatus. However, in this project, what I'm able to do is to allow my unconscious mind to dictate the path of the music, and to control the system. And I don't actually have to listen in the sense that I can wear hearing aids with the volume turned on or bestel earplugs as during the performance. So I can actually execute sustained work without having to necessarily listen to it. And obviously, this, this is a complete transformation of the musical basis of my understanding to date. In that, I've had to unlearn everything I think I know about music, to make music with the system. The project was a case study for a larger project called the Digital score. I don't propose to dwell too long on this, but one of its objectives was to achieve a broader accessibility for musicians of traditional and non traditional backgrounds. And what's emerged with that project, which is currently a year old and is located now at the University of Nottingham. Is that the, the interest in this kind of accessibility to groups who are traditionally excluded or marginalised has become quite a major theme already in what they're doing, and challenges many of the fundamental concepts of the score, and I've musicking that that have here two four have informed the way the projects been created. So this final objective How to digital scores stimulate new relationships between musicians. That has become, as it were the focus of this case study and concept of a score here, obviously, it's very different to traditional notation score. The score here is embedded in the technology and indeed embedded in the unconscious minds of the musicians. So, we have various issues that we have to tackle with this project. The first concern is the relationship between the composer performer and the audience. And the traditional model that we are all familiar with, tends to work against co creation. And it tends to compartmentalise musicians. So, in this project, we co created everything, and everybody was both composer, performer and audience. Another issue that I've already mentioned is to do with deafness and Hard of Hearing musicians and hearing differences, and we have to rethink the traditional ideas of musicianship. The third issue is a perhaps a larger one about autism. Autistic musicians often tend to be excluded from the musical scene due to social communication and sensory issues. Basically, the music business, as we all know, thrives on our notion of networking. And if you are not well suited to networking, then this can prevent an obstacle to your access to the musical scene. So our challenge was can a digital score provide a platform in which a quartet of deaf and autistic musicians could work creatively and challenge the traditional composer performed model towards a way of working that's more inclusive. So in the project, we have four musicians. And I think three of these will probably be familiar to people here. There's myself, obviously in market harbour annulus, to jet ski, who's located in Brighton. She's an autistic composer and a musician who works with a variety of sounds and instruments. And she's particularly interested in immersive and abstract narrative sound experiences. And you're performed on the flute in our first concert in 2019. And she also composed some music that was streamed to mobile headphones in that concert. That isn't that's the calendar is a classical cellist who plays for the London for lemania. But for LA Monica orchestra, She's based in Sweden. She's also autistic and is a cultural ambassador of the National Autistic Society. And Simon Allen is a composer and percussionist, who has quite severe hearing loss. About 50% loss from the top down in terms of area on the audiogram accompanied by hyperacusis tinnitus, and he uses two hearing aids. And during this project, he was mainly located in Sri Lanka, although he did come back to London for part of the time. So the project ran from March to October 2022. And comprised of six online sessions. And as I mentioned, we use the emotive insight. Now, this offers a range of data streams, the raw EEG data, mental commands, which

is where you can use your mind to control the movement of objects on screen, facial expressions, motion data. So it's not just about what happens in the brain, although obviously everything happens in the brain. But it doesn't just measure that it also measures other other data as well. But we decided the very first session, really that what we were interested in only was the performance metrics. That's to say stress, engagement, interest, relaxation, focus and excitement. Those are the things that that seem to offer the most potential for us. And we did nothing this device I think, quite ablist in its construction. The kind of training that you were required to do to issue meant All Commands seem to be very much a neurotypical kind of way of thinking. And, of course, as a group of autistic people, by and large, we found this challenging in all sorts of ways. However, the performance metrics worked very well. And what was surprising given that these labels of stress engagement and so on, seem fairly arbitrary. Actually, they corresponded very well to the way we responded to the various sounds. And what was interesting, I think, during the project was the differences between the actions of our unconscious minds and the, the way we felt that we were responding to the sounds. So the app that was written, this was created by Craig via and beta tested by him and myself. And it's available as a Python library if you want to download it. And it provides real time control of libraries of self created sounds and visual materials. And as I say, it enables the brains of the musicians to dictate the course of events independently of conscious decision making, and are sharing between the musicians. So there are three steps to the process. First step was that the remotely located musicians created or recorded sounds that were meaningful to them. And then wearing the brain readers, they then categorise the sounds based on the performance metrics. Then we started creating the synergies. So this is the communication of conscious and unconscious minds. This is where we start to combine the reactions of Firstly, to musicians, then three, and then four. So we started to find alignments and differences, connections and correspondences between the four of us. And the process really was one of building these networks of reactions. And then finally, we added some additional notation. This was visual because you can use the app to display visual images as well. To provide notation for Elizabeth the klunder, who's a cellist so we all agreed that we wanted to write some Chalian music as well. So that was added to the Quartet synergies, of which there are two and created a richer musical texture. So you can listen to these at the address shown on the screen here. I've got a couple of examples, but I don't think there's time to play them. But anyway, do do go ahead and listen there are there are actually 12 synergies available, as I say, starting with individual worlds, then combining into Duo's trios and finally quartets. Broadly speaking, my world was composed and process sounds compliant, combining digital and acoustic sounds. With the image of a weather vane blowing around arbitrarily corresponding to the performance metrics, and use world quite different minute examinations of materials such as Velcro, and her favourite metallic sounds. They were apparently every day members strike betrayed a distinctive form of listening. Elizabeth's well was very much based on nature. She'd also become a mother during the project so there were quite a few recordings of her of her baby. But But recordings of rain and storms of logs and log log cabin and a sauna heating up and then Simon Allen, as people may know, builds his own instruments. So we had a whole array of original instruments, barrel piano, goldfish bowls, wine glasses, mouth, bow, ritual horn, medicine, rattles and so on. And each of these sounds has a personal significance for Simon. So as I say, the, you know, for example, if I was doing a duet with with Ania as annuals, music is played to me I respond my responses then produce another sound either from my own collection or from her collection and so on and so on and she's doing the same at the other end so we're able to combine our responses in that way. So the works are a real network of these unconscious and perhaps semi conscious chorus correspondences between us okay,

I think that some sums up the project just play a little bit of the music this is part of the one of the final portents? Okay, I'll have to wrap up now, but I'll just say to finally that, you know, this has had quite an impact on all of us. And one comment I made was, I'm seeing this self actualizing brain that is making interesting music regardless of me. So it's kind of the opposite of conventional music baking