An Agent on my Shoulder: AI, Privacy and the Application of Human-Like Computing Technologies to Music Creation

Alan Chamberlain[1*] Alessio Malizia[2] & David De Roure[3]

[1*] MRL, Computer Science, University of Nottingham, UK, Alan.Chamberlain@Nottingham.ac.uk
[2] School of Creative Arts, University of Hertfordshire, UK
[3] Oxford e-Research Centre, University of Oxford, UK

Abstract — **Human-Like Computing technologies are intelligent systems that interact with people in human-like way. By bringing together the disciplines of Artificial Intelligence, Ethnography and Interaction Design, and applying them in a real world context we are able to understand some of the ways that such technologies can be applied. This work in progress poster applies such technologies to the music creation and develops a design that is based on the notion of an 'Intelligent' Agent that is able to support in the music creation process.**

I. MUSIC, IN PRACTICE

For anyone involved in the creative industry, the world appears to be full of concerns and challenges when it comes to dealing with digital rights, ownership, originality and re-use. The music industry is a prime example of this. With the development of different ways to create, distribute, compose, consume and perform the music industry is becoming more complex. The rise in digital technologies for creating and distributing music has meant that billions of audio files (and related content) are served to the public, and with many services offering multiple channels and methods of consuming music it is difficult to see what the most appropriate ways are for musicians to sell and keep a record of what is being served. If we then think about the way that one can create music using Digital Audio Workstations, songs can and are made out of multiple stems, samples, sets and in many respects it is difficult to know how and when to protect and keep this work private, or when to and how to release developing work in order to generate publicity. This abstract discusses an initial description of a conceptual system that is looking at the provision and design of Human-Like intelligent agents that can support musicians as they create and release music, in respect to the challenges that we have outlined.

II. AN "AGENT" ON MY SHOULDER

We use the metaphor of an "*Angel on my shoulder*" in order to represent the Intelligent Agent that acts in a human-like way to give advice and support, this extends our earlier work relating to robots and music [1]. This isn't advice that relates to composition practice, but as we earlier outlined information and advice that relates specifically to the rights, releasing, re-use and distribution of music – offering advice on the implications of such actions. In our early research we found that people can have a playful attitude to new musical technologies [2]. Based on this, and a need to train the system, we propose a game-like approach that can both support the user in terms of getting used to the system and for the system to learn more about the user and to 'learn' to react in a more human-like way. Using a gaming approach enables the user to get used to the agent-based system in more 'natural' way and also learn about the issues and legalities of the music industry.

III. IOT, DATA & MUSICAL EQUIPMENT

With the development of IoT-based musical equipment instruments are possible to capture data throughout the creative process, and this data may be used in a variety of ways that could support the system in learning about user practices, but could also be used in other ways to support the design of future systems, provenance composition and even support learning. So although our initial framework is based in managing digital rights a Human-Like Computing approach could work in a variety of contexts within the music domain, which could lead to the development of intelligent plugins. Using intelligent plugins that can support and inform musical practices across software, hardware, platforms and channels offer new and interesting challenges for the development of an *Ecology of Audio Technologies* that has yet to be realized or fully understood.

IV. CONCLUSION

Human-Like Computing technologies and the Internet of Things offer new opportunities for the music industry, but also create new challenges. In order to fully appreciate the ramifications of using such technologies there still needs to be more understanding of the practices of people making music in the 'wild' [3]. It is hoped that this poster gives some insight into this area and generates some interest in this emerging area of research.

REFERENCES

[1] Alan Chamberlain (2017) "Are the Robots Coming? Designing for Autonomy & Control in Musical Creativity & Performance." Audio Mostly 2017: 23-26 August. QMUL, ACM.

[2] Andrew McPherson, et al (2016) "Designing for Exploratory Play with a Hackable Digital Musical Instrument", Proceedings of Designing Interactive Systems, DIS'16, June 4 - 8, ACM.

[3] Crabtree, A. et al. (eds.) (2013) Special issue on "The Turn to the Wild" with authored introduction", ACM Transactions on Computer-Human Interaction - ToCHI 20(3), 13:1-13:4.