Thesis Project Portfolio

Software to Improve MIDI Controller Usability

(Technical Report)

Understanding the Influence of Digital Technology in Music Creation

(STS Research Paper)

An Undergraduate Thesis

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William Litton Haslet

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Executive Summary

The thesis portfolio contains a technical report and an STS research paper, connected by the overarching theme of technology in music. The technical report proposes a MIDI modification software that seeks to improve the usability of MIDI controllers. The motivation for designing this software is the lack of convenient options to configure MIDI controllers, and the limited functional potential of configuration when the option is provided. By using software to control MIDI messages, users are able to use MIDI controllers more flexibly. The STS research paper analyzes the mutual shaping of digital technology and music creation in order to understand the shaping of the perspectives of opponents and proponents of the use of digital technology in music creation. Conflict over the artistic legitimacy of digital music and the superiority of sound created analog technology can be misunderstood as simple resistance to changing technology or aesthetic preferences, but by considering the participants' history with music, economic factors, and the accessibility of digital technology, these arguments around digital technology in music can be better understood.

MIDI controllers are a useful hardware tool for music creation, but their limited and inconvenient customization options hold back their full potential. In the technical report, a solution to this problem is proposed in the form of a MIDI modification software. The proposed software would act as a virtual controller that translates and transmits incoming MIDI messages in accordance to the configuration provided by the user. Moving the customization options from the hardware to software would make modifying MIDI controller output more convenient for users. The software would also allow users to configure multiple MIDI devices from a single software instead of needing to use the manufacturer's dedicated software or the customization options that are built into the controller. A critical feature of the software would be the inclusion

of modification presets that store a set of modifications that the user designs for a specific task. By allowing the user to create and switch between multiple presets, a single MIDI controller would be able to be used across multiple instruments or applications that each expect different MIDI messages. The proposed software would make the music creation process more efficient by expanding the usefulness of MIDI controllers and decreasing the time spent doing unproductive tasks like hardware configuration.

The introduction of digital technology into the world of music has been the catalyst for arguments about aesthetics, artistry, and accessibility in music. In the STS research paper, the mutual shaping of digital technology and music creation is analyzed in order to better understand the social, economic, and historical influences on opinions of the use of digital technology in music creation. There are primarily two groups analyzed in the research: the opponents and proponents of the use of digital technology in music. The opposition likes the aesthetics of analog sound more than digital and are concerned that artistic technique and legitimacy are damaged by the ease of use of digital technology, while the proponents find that the ease of use benefits the accessibility of music creation and are excited by the new aesthetic and creative possibilities that digital technology brings to artists. The research finds that there are elements of preference, history, and economics that shape the opinions of either side. The opposition's preference for analog technology is not only an aesthetic preference, but also an effort by established musicians to protect their contribution to musical history. Younger artists dive head first into digital technology because of its accessibility and the established musicians question the artistry and legitimacy of musical creations made with digital technology due to its ease of use. Arguments about the value of digital technology is music are influenced by the participants' history with technology, experience in music, and economic situation.

The projects were successful overall, but I would have liked to expand the scope of both projects further than was possible in a single semester. The technical project has a solid foundation for more extensive design and development. It would benefit most from the development of a graphical user interface, as the prototype made for the report is focused on getting the core of the software functional, with no regard for its usability. With a user interface, it would also be possible to preform user testing and validate the design choices proposed in the report. I would have liked to expand the STS research with data collected from beyond the current literature on the topic of technology in music. With data from more participants in the debates about digital technology in music, the debate could be understood more extensively.