

An Early-Stage Autobiographical Account of a New Performance Technology

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Background

Digital musical instruments (DMIs) are undergoing a prosperous period thanks to the proliferation of sensing technologies. Despite this prosperity, however, virtually all DMIs have so far failed to go mainstream as most of them have disappeared after a handful of performances only. If, on the one hand, this lack of success necessarily limits their artistic legacy, on the other hand their very creation gives rise to literacy and knowledge of instrument design and performance. It thus becomes of primary importance to document the evolution of new DMIs from their early stages to build theoretical and practical knowledge to be used by future instrument creators.

Aims

This manuscript aims to present the Magpick, a new technology for electric guitar, and to describe an autobiographical account of the early explorations of this new technology in a performance context.

Main contribution

At the outset of the project, I aimed to create a technology for guitar that could use the subtle gestures of the plucking hand as a performance material. With the help of Andrew McPherson and Andrea Guidi from Queen Mary University of London, I recently created the Magpick to answer to this need. The Magpick is a custom-designed guitar pick with a hollowed body containing several loops of wire. By exploiting the laws of electromagnetism, when the pick is moved on the area above the guitar pickups an induced electromotive force is generated in the coil. This force is proportional to the rate of change in magnetic flux and thus provides detailed information on the gestures of the plucking hand. The force is then amplified and connected to an audio processor, where it is combined with the signal from the guitar to produce a new output signal that modifies or extends the sound of the guitar. This solution accurately responds to the speed, location, and intensity of the

pick movement in the pickup area, enabling a very subtle control on the sound of the guitar, which can't be achieved by any other means.

As I began using the Magpick in my performance, the aspects of it that I came to value the most were features that I have not purposely designed, and that are gradually defining the very nature of the Magpick. One of these features is connected to the way in which it disrupts the magnetic field. When the Magpick moves across a magnetic field it does not just *sense* it, but also *modifies* it. I empirically observed that when the movement of the pick terminates the force created in the Magpick *bounces* for a few instants before going back to zero. The rhythm created by this bouncing is of the most interesting behavior that I have found so far and that I am currently using in my performance practice.

Implications

I shared initial reflections on my own experience with the Magpick that might be useful to other instrument creators: be prepared for the unexpected and avoid be open to reassess the role of you creation in your performance.

Keywords

Augmented guitar pick; technology for performance; Magpick; musical instrument design; augmented instruments

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