

Musical Instrument Mapping Design with Echo State Networks

Echo State Networks (ESNs), a form of recurrent neural network developed in the field of Reservoir Computing, significant potential for use as a tool in the design of mappings for digital musical instruments. They have, however, seldom been used in this area, so this paper explores their possible applications. This project contributes a new open source library, which was developed to allow ESNs to run in the Pure Data data flow environment. Several use cases were explored, focusing on addressing current issues in mapping research. ESNs were found to work successfully in scenarios of pattern classification, multiparametric control, explorative mapping and the design of nonlinearities and uncontrol. Un-trained behaviours are proposed, as augmentations to the conventional reservoir system that allow the player to introduce potentially interesting non-linearities and un- control into the reservoir.

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