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Deep Adaptive Music: The Ultimate Frontier of Machine-Generated Music?

AI has long been employed to create music in numerous styles, from baroque to pop music, with different degrees of success. Arguably the focus of most generative systems hitherto developed both in academia and industry has been the offline creation of linear music. Although the design and development of such systems is a valuable endeavour, in this paper I argue that the ideal application for AI music generation systems is the creation of realtime music for nonlinear content.

In order to support this position I introduce the concept of *deep adaptive music* (DAM). This is music generated in realtime by a collaboration between humans and AI and which adapts its emotional state to match the ever-changing environment of a non-linear experience, such as a video game or a VR application. Throughout the paper, I will be using Melodrive - a commercial generative music system - as a use case to show the different facets of DAM.

Current adaptive techniques adopted by human composers to score interactive content are limited in the way they can match the unfolding narrative and visual experience. Whilst linear music can be completely mastered by human composers, it is not possible for composers to create music to address the infinite nature of non-linear content. For example, a video game would require infinite music in order to accommodate the potentially infinite unique paths in the story world.

With DAM, AI is put to use in such a way that it may actually enhance the musical results associated with scoring interactive content. In fact, a DAM system may produce music that is qualitatively better suited to its target media than that of a human composer. DAM provides a new way of creatively using AI, which departs from the mere replication of what human composers can do, enabling a unique synergy between humans and machines, in order to generate music which would be otherwise impossible.