

AI in Music production

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Abstract:

With the advancements in AI and machine learning, the field of Audio and Music has drastically progressed, offering new ways for musicians to create. Music production, in particular, has been seeing various innovations like automatic music generation, music transcription, music source separation, AI-driven mixing and mastering, etc. While these tools are widely available to musicians who are not expert audio engineers, existing interfaces can be frustrating for newcomers, as their interfaces are parameterized in terms of low-level signal manipulations that may not be intuitive to non-experts. The goal of this research is to build end-to-end neural audio effect systems based on audio-specific neural network architectures which can process audio effects such as equalization, reverberation, compression, etc based on descriptive terms sourced from a crowdsourced vocabulary of word labels for audio effects. Furthermore, in the context of deep learning, recent advances have led to the development of larger models capable of achieving remarkable results through the utilization of vast amounts of data. However, in the domain of music production, real-time processing poses a significant challenge, particularly regarding computational resource requirements, specifically in central processing units (CPUs). This presents a compelling opportunity for extensive research endeavors aimed at developing neural network models that exhibit significantly reduced size while maximizing computational efficiency. To address these challenges, exploring model compression techniques such as pruning, and quantization becomes crucial. These techniques can significantly enhance the feasibility of real-time audio processing on CPUs, making advanced audio production tools more accessible and efficient for musicians and producers.