

Thesis: AI-Based Audio Effects Device

This master thesis project aims to design and implement an AI-based audio effects device, capable of simulating various effects, such as overdrive, distortion, and compression. The research will address the following research questions:

- How can machine learning algorithms accurately simulate the parametric nature of audio effects?
- How does the AI-based audio effects device compare to traditional effects in terms of sound quality and adaptability?
- Can a generic model incorporate different effects and adapt its processing?
- What hardware and software architecture is suitable for implementing the AI-based real-time audio effects device?

To address these questions, the following steps will be taken:

1. Collect a dataset of audio samples with different effects applied for training the machine learning algorithms.
2. Implement and train machine learning models to simulate the parametric nature of audio effects.
3. Conduct subjective listening tests to compare the sound quality and adaptability of the AI-based audio effects device to traditional effects.
4. Design and develop a hardware prototype for the AI-based audio effects device, considering signal processing, analog-to-digital conversion, etc.
5. Integrate the trained models into the device's software framework, enabling real-time inference.



For more information, please contact:

- Matthias Wess (matthias.wess@tuwien.ac.at)