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## Project Proposal

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Machine Learning for Signal Processing

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## Abstract

Automatic Music Transcription (AMT) is a fundamental problem in Music Information Retrieval (MIR). In [3], it was recommended that the pseudo bispectrum analysis model could be improved by implementing post-processing using neural network. The following project goal is to implement such post processing to improve the result obtained by [3].

## 1 Introduction

## 2 Litterature review

in [2], they used Neural Network in order to do Automatic Music Transcription

## 3 Input-Output-dataset

The dataset used will be the MAESTRO V3 dataset[1]

## 4 Performance metric

the performance metrics will be evaluated using the Mir\_eval librairy. The main metric will be the  $f$  measure with  $\beta = 1$ .

## 5 Computatinnal ressources

We will use Valeria to train our model.

## Checklist

- ✓ **Realism:** The project will be completed within a reasonable time frame, using available resources like Google Colab.
- ✓ **Well-defined dataset:** We will use the Maestro v3 dataset to label our pseudo 2D spectrums with the right note labels.

- ✓ **Clear input-output definition:** The input will be song in wav format and the output will be a pianoroll of the song.
- ✓ **Non-trivial:** The project explores a novel approach to AMT using pseudo 2D spectrum as the input of our neural nets as proposed in [3].
- ✓ **Machine learning/signal processing focus:** The project incorporates machine learning techniques, specifically [ML/SP technique], ensuring concrete predictions.
- ✓ **Literature grounding:** A literature review is included, situating the project within existing works, referencing relevant papers such as [3] and [2].

## References

- [1] Curtis Hawthorne et al. “Enabling Factorized Piano Music Modeling and Generation with the MAESTRO Dataset”. In: *International Conference on Learning Representations*. 2019. URL: <https://openreview.net/forum?id=r11YRjC9F7>.
- [2] Lele Liu, Veronica Morfi, and Emmanouil Benetos. “Joint Piano-roll and Score Transcription for Polyphonic Piano Music”. In: *DMRN+15: Digital Music Research Network One-day Workshop 2020*. Queen Mary University of London. 2020.
- [3] Weiwei Zhang, Zhe Chen, and Fuliang Yin. “Multi-Pitch Estimation of Polyphonic Music Based on Pseudo Two-Dimensional Spectrum”. In: *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 28 (2020), pp. 2095–2107. DOI: 10.1109/TASLP.2020.3007794.