AI Systems Implementation Project Briefing

Group U03

Project Managers: Mateusz Ajose and Amelie Gonzalez Capdepon.

Area of AI: A Deep Learning Framework for the Classification and recognition of different Music Genres

Members: Amelie Gonzalez Capdepon, Bernard Mendoza, Conor Woollatt, Daniel Perry, Mateusz Ajose, Oliver Longley

Project Goals:

- To train different AI models on audio files and related data using neural networks.
- To be able to classify or differentiate audio files based on genre as accurately as possible.
- To compare different types of AI models, to determine the accuracy of each model depending on the genre.
- To combine multiple models to produce the ultimate AI model, capable of classifying audio files from the given data.

Requirements list:

- Dataset that includes audio files and their related data, categorised in appropriate files.
- Python and relevant libraries (CNNs/AI system, NumPy, Matplotlib, Pandas, etc)
- A powerful enough computer to be able to train the program/access to Raptor

Feasibility analysis:

- Technical Feasibility:
  1. Available resources and expertise:
     a. The internet: tutorials, forums, python documentation, YouTube.
     b. Resources from the University, such as lectures and class materials.
     c. Managing shared code through a platform such as the university's GitLab.
  2. Potential Technical challenges:
     a. Powerful enough computation and time to train the AI.
     b. Finding a way to produce AI models that are efficient even for a specific genre.
     c. Finding the most optimal way in combining multiple models together in an ensemble.
- Operational Feasibility:
  1. Impact on workflows and processes:
     a. Pushing updates on the same time without proper communication.
     b. Using platforms such as Teams and WhatsApp to coordinate work.
  2. Risks and mitigation strategies:
     a. Proper communication between the team before pushing updates.
     b. Compatibility issues when pushing code to outdated branches or combining models.

Project Plan:

- **Week 1** – Create three or four separate kinds of models using Spectrograms, Mel-Spectrograms and Chroma Vector

- **Week 2** – Create two or three more models using Fourier transform, Tempo and Rhythm Features. Also attempt to combine two of the previous week's models.

- **Week 3** – Combine two more models and have one model that combines three or more models if possible.

- **Week 4** – Double checking and finalising of the code as well as the project report.