[CMP040X301Y](https://moodle.roehampton.ac.uk/course/view.php?id=13408" \o "2022.23 Final-Year Project - CMP040X301Y) BSc Project Proposal Form

|  |  |
| --- | --- |
| **Student Name** | Antonio Ramon Oliver (Tony) |
| **Student ID** | YIT19488399 |
| **Project Title** | DJ Pyoneer Neterlan |
| **Programme** | 2022.23 Final-Year Project (FYP), CMP040X301Y |
| **First Supervisor** | Dr. Wei Li |
| **Second Supervisor** | To be confirmed |

# Project Description

|  |
| --- |
| Collection of data manually for after finding the right algorithm to train the computer to generate and create new music. Machine Learning and Deep Learning mastery will be applied to this project. Computer will be equipped with Artificial Intelligence in the music field. Because few research is done in this artistic sector and computers can be used to help human creativity, my project is excellent fit.  Human will evaluate the quality of the computer product. Ideally, I will organise an audit with simple survey if like or not the music. Mathematical evaluation will be performed if data and model allow. Performance, accuracy confusion matrix will be calculated.  If the result is good, it can be delivered in real time or in form of a recorded music. It can be monetized in online music platforms like Spotify, YouTube Music, or iTunes. Or private contract with clubs, video-games developers, movies producers, and other entertainment businesses.  I will not generate and develop my own training model to fit music data. I will use existing models and find harmonization in initial data and/or in the model (training algorithm). Recurrent Neural Network (RNN) and LSTM (Long Short-Term Memory) to predict next note is my base with intention to make discoveries. There are not much research nor investigations about music generation/mixing with computer. This philosophy makes this project not 100% inelastic.  Finally, I will implement in my project a volume management with computer vision. I will use my hand in front of the webcam to adjust volume. It is faster and secure. A feature of face recognition could be added if time allows. Both uses image detection and recognition concepts. |

# Project Aims

Please list up to three aims of your project. An aim is an expected outcome of your project.

|  |  |
| --- | --- |
| 1 | Obtain quality music from computer as output |
| 2 | I will study MRes (NOT MPhil) in communication and networks (CS, waves, packets) |
| 3 | Create new musical style or new sounds (artificial imitation of real instruments or new instruments) |

# Project Objectives

Please list up to five objectives of your project. An objective is a tangible task you will complete.

|  |  |
| --- | --- |
| 1 | Collect and process suitable music dataset |
| 2 | Research and employ the appropriate existing algorithms to train model on processed musical data |
| 3 | Design the evaluation strategy and exploit evaluation metrics to perform a reasonable evaluation |
| 4 | Implement volume management (computer vision and image recognition) |
| 5 |  |

# Background Information

|  |
| --- |
| This project is very interesting and challenged, because I will choose and apply existing ML/DL models on musical dataset. There are a lot of models created by PhD and professionals. The challenge is that not many of these models were developed specifically for music, and some adjustments need to be discovered.  Data is available in tons and the final product is artificial music produced artificially (“”).  I will enjoy working with music as well.  Finally, my volume management tool will OKAY in case music production is not obtaining good results.  Similar projects are Magenta (Google), Maestro or AIVA [[1]](https://emerj.com/ai-sector-overviews/musical-artificial-intelligence-6-applications-of-ai-for-audio/). But those are UI and paid subscriptions. Many ML project in the field of Vision, Speech, Images, Sentiment analysis and Prediction of stock prices, exist. My project still has huge route to do to get “perfect”.  Some references:   * <https://magenta.tensorflow.org/> * [Generate music with an RNN  |  TensorFlow Core](https://www.tensorflow.org/tutorials/audio/music_generation#:~:text=Generate%20music%20with%20an%20RNN%201%20Setup%20This,train%20the%20model%20...%208%20Generate%20notes%20) * [https://cs229.stanford.edu/proj2018/report/18.pdf](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcs229.stanford.edu%2Fproj2018%2Freport%2F18.pdf&data=05%7C01%7Cramonola%40roehampton.ac.uk%7C2340b99281c343979e5c08daac614b72%7C5fe650635c3747fbb4cce42659e607ed%7C0%7C0%7C638011831112540390%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=zCkZiNyg22uliE2gaR8W%2FbAZ091bhOxTse5NEe5BWoc%3D&reserved=0) * <https://www.youtube.com/playlist?list=PL-wATfeyAMNr0KMutwtbeDCmpwvtul-Xz> * [45871.pdf (googleusercontent.com)](https://static.googleusercontent.com/media/research.google.com/en/pubs/archive/45871.pdf) * [IJISRT22MAY250\_(1).pdf](https://ijisrt.com/assets/upload/files/IJISRT22MAY250_(1).pdf) * [Music Generation for Novices Using Recurrent Neural Network (RNN) | IEEE Conference Publication | IEEE Xplore](https://ieeexplore.ieee.org/document/9633906) * [(PDF) Music transcription modelling and composition using deep learning (researchgate.net)](https://www.researchgate.net/publication/301818301_Music_transcription_modelling_and_composition_using_deep_learning) * [1] https://emerj.com/ai-sector-overviews/musical-artificial-intelligence-6-applications-of-ai-for-audio/ |

# Risks, Ethical Issues, and Other Considerations

|  |
| --- |
| Ethics:   * Data (music) can have copyright, need to be dealing with carefully to find the open-sourced dataset. * When working with music, I should respect neighbours (noise). * Bias should be considered in data preparation and evaluation. * User evaluation may needed, consent is required form them in this condition.   Risks:   * Musical data processing is a big challenge, the quality may be poor * No good music at the end of the project or not all listeners will welcome my music * Computer resources and time to train a computer is limited as student. Music has many features to train the computer * Nobody will pay for my music sold online (streaming) and recorded as songs * Evaluation strategy design brings a big challenge for us. |

# Signoff

|  |  |
| --- | --- |
| **Student Name** | Antonio Ramon Oliver (Tony) |
| **Signature** |  |
| **Supervisor Name** | Dr. Wei Li |
| **Signature** |  |

It is the supervisor’s responsibility to approve this project as meeting the requirements for the module. This includes professional body requirements, programme requirements, and module requirements. By signing the form, you are agreeing you have validated the suitability of the project.