

Artificial Neural Networks CAN compose music!

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ABSTRACT

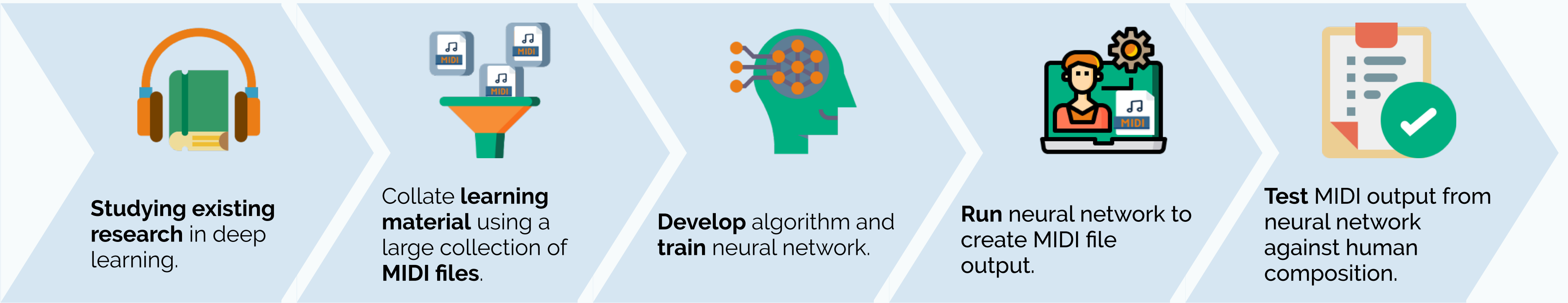
The aim of this project is to **develop a machine learning algorithm** to be able to **learn and compose** a piece of music based off trends and patterns discovered from a dataset of songs within a given genre.

METHODS

- The proposed **neural network** is used to **compose music** of a genre in which it has been trained on. Firstly, the programme will convert the **midi** into score data and transpose the music to be either within the key of C major or A minor.
- The data can then be split into **training sequences** so that the training model can learn trends and patterns within the data.
- With the information the model has obtained during training, the model can then **create an output** midi file which can then be interpreted by a digital instrument in a digital audio workstation.
- The development methodology chosen for this project is the **iterative approach**. This was chosen because it allows for smaller sections of the project to be implemented therefore **easier to achieve deliverables**.

AIMS & OBJECTIVES

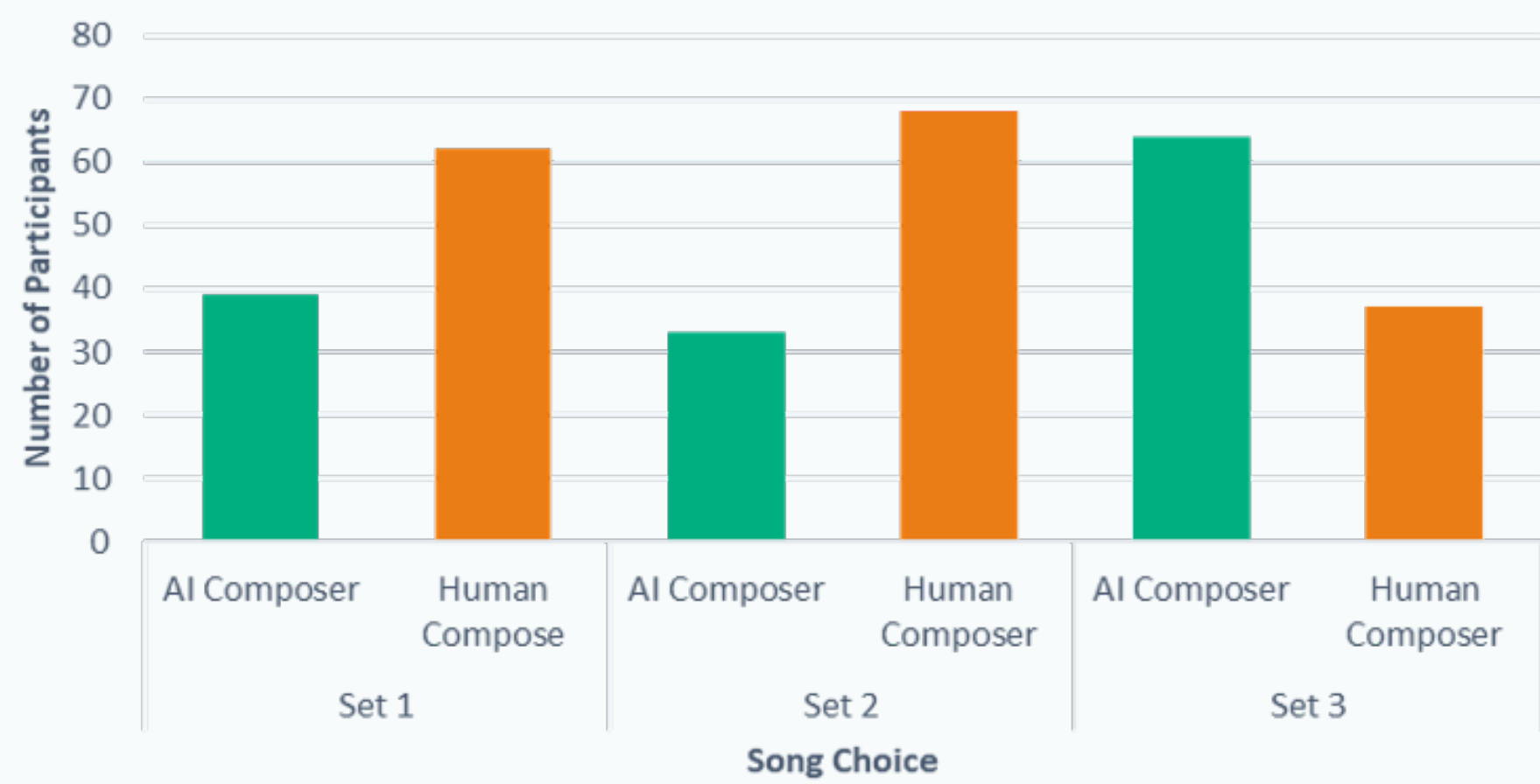
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RESEARCH OVERVIEW

- The area **main area of research covered artificial intelligence** and machine learning. Key elements discovered from reviewing literature include:
- Machine learning is the field of study in which a computer is able to **learn** to perform a task without the need to be **explicitly programmed** [1][2][3].
- Artificial neural networks are tools used to **facilitate machine learning** and is based on an animals brain [4]
- Recurrent neural networks (**RNNs**) are a special kind of neural network that allows for information to be stored over training steps [5].
- Many other researcher use long short-term memory RNNs when attempting to study this problem [6][7]

RESULTS



44%
of users
were tricked
by the AI!

Our participants
described the AI
composition as...

Natural

Harmony
Complex

CONCLUSION

The developed model was able to create a midi that when interpreted by an instrument in a DAW was mostly pleasing. When collecting data on the effectiveness of the model and its comparability to a human composer, the AI was able to fool 44% of people into believing that music composed by it was human.

FUTURE IMPROVEMENTS

- Obtain samples from all genres to improve validity
- Experiment with other classes of neural networks such as generative adversarial and transformers to understand if newer classes of neural networks can perform equally.
- Implement other forms of primary research such as study groups to enrich the quality of qualitative research.

~ Inspired by the project *DeepBach*

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