

# **SONI - DO:**

## **GENERATING MUSIC WITH ARTIFICIAL INTELLIGENCE**

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Data Science - The Bridge 2021

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**(...and music lover)**



# Introduction

Music is associated with emotions, experiences and creativity, all of them considered human's qualities.

This project has been done to prove that technology has advanced to the point where artificial intelligence, that cannot experience those feelings, can generate music.

For this aim different types of neural networks have been analysed. Two Long short-term memory (LSTM) models (a Bidirectional and a Unidirectional network) and a Generative adversarial network (GAN) considering different layers and parameters.

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Neural Network:  
- LSTM model  
- GAN model

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# 01 Pre-processing

- 01 MIDI files as data
- 02 Conversion for their use in Python
- 03 Extraction of relevant information (notes/pitches, rests, and chords)
- 04 Codification

## 02 Neural Network: LSTM model

- 01 Long Short-Term Memory is an artificial Recurrent Neural Network (RNN)
- 02 Unidirectional and Bidirectional LSTM
- 03 It has feedback connections.
- 04 It can process entire sequences of data.

# 02

## Neural Network: GANs

Generative Adversarial Networks (GANs) are capable of generating new data that conforms to learned patterns.

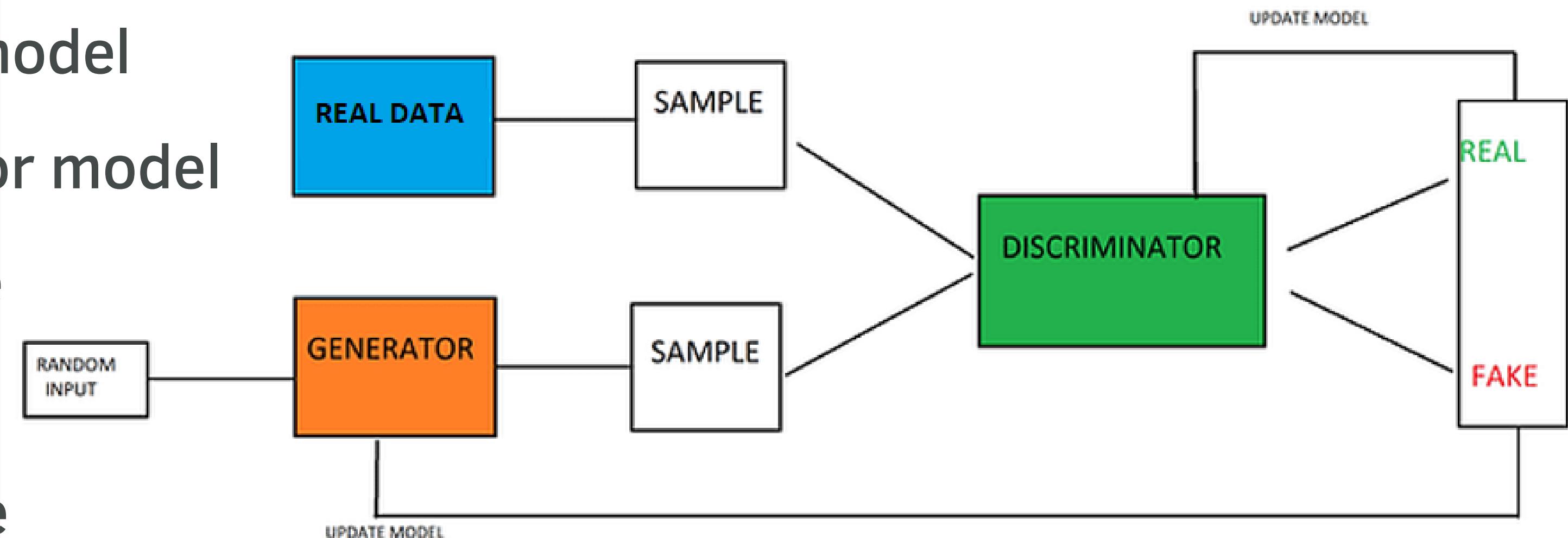
1. Generator model

2. Discriminator model

3. Real sample

4. Noise

5. Fake sample



# 02 Neural Network: GANs

01

Generator creates poor data / Discriminator distinguishes it is fake --> Generator is updated.

02

Generator creates better samples / Discriminator distinguishes it is fake --> Discriminator is updated.

03

Fake samples are fed to the discriminator

04

Repeat until the discriminator cannot discern between real or fake and the generator cannot produce more realistic data.

# 03 Post-processing

- 01 De-Codification
- 02 Transformation to MIDI files
- 03 Transformation to wav files

# 04

## Results

Go to Streamlit to listen to audio files:

<http://localhost:8501/>

# 05 Conclusion and Next Steps

**Conclusion:**

**Artificial Intelligence is capable to generate new melodies**

**Next Steps:**

**01**

**Research, research, research**

**02**

**Trial and Error**

# Thanks for your attention!



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