RhythmGenius - Melody generation using RNN-LSTM

Submitted in partial fulfilment of the requirements of the degree

BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

By

Pratik Kithani

Kishan Kokal

Shubham Mandal

Harsh Punjabi

Guide:

Prof. Anagha Durugkar

(Associate Professor, Department of Computer Engineering, TSEC)

Computer Engineering Department

Thadomal Shahani Engineering College

Bandra (W), Mumbai - 400 050

University of Mumbai

(AY 2023 - 24)

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Group No: 26

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Certificate

This is to certify that the project entitled **"RhythmGenius - Melody generation using RNN-LSTM"** is a bonafide work of

2003094 Pratik Kithani

2003095 Kishan Kokal

2003105 Shubham Mandal

2003136 Harsh Punjabi

submitted to the University of Mumbai in partial fulfilment of the requirement for the awarded degree of **"Bachelor of Engineering"** in **"Computer Engineering".**

Prof. Anagha Durugkar
Guide

Dr. Tanuja Sarode
Head of Department

Dr. G. T. Thampi
Principal

Project Approval for BE

The Project entitled **"RhythmGenius - Melody generation using RNN-LSTM"** by

2003094 Pratik Kithani

2003095 Kishan Kokal

2003105 Shubham Mandal

2003136 Harsh Punjabi

is approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

Examiners

_____
(Internal Examiner Name & Sign)

_____
(External Examiner Name & Sign)

Date:
Place: Mumbai

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. we also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Pratik Kithani (2003094)

Kishan Kokal (2003095)

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Date:

Abstract

In the realm of music composition, this project aims to create a music generation system leveraging Recurrent Neural Networks with Long Short-Term Memory (RNN-LSTM). The objective is to train this system on a dataset of folk melodies and enable it to generate novel melodies that exhibit similarities to those found in the training data. This project seeks to delve into the intricacies of melody creation by treating it as a time-series prediction problem, predicting the progression of musical events in time. Through LSTM's capacity to capture long-term temporal dependencies, this project aims to replicate the structural patterns found in melodies, which often involve repeated patterns with variations in pitch content, stretching, or shrinking. The project's foundation rests on the ESAC dataset, comprising over 20,000 folk melodies from various parts of the world. The core tools and libraries employed in this project include Keras/Tensorflow for deep learning, Music21 for symbolic music data processing, and MuseScore for music notation. This collaborative effort involves team members Pratik Kithani, Kishan Kokal, Shubham Mandal, and Harsh Punjabi, under the guidance of mentor Dr. Anagha Durugkar from Thadomal Shahani Engineering College.