

A vintage microphone is positioned on top of a typewriter keyboard. The microphone is a classic, ribbed, silver-colored model. The typewriter is dark-colored, and its keys are visible in the foreground and background. The entire scene is dimly lit, with a soft light source creating a gentle glow around the microphone and the keys. The background is dark and out of focus.

Music Composition System: AI-Driven Creativity

An automated system for generating original music
compositions across various genres.

Group Members

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Problem Statement

A vintage electronic organ console, likely a Yamaha model, is positioned diagonally across the frame. It features a dark wood-grain finish and a series of light-colored, rectangular keys or buttons along its front edge. The console is resting on a sheet of musical notation, which is slightly out of focus. The background is a dark, textured surface, possibly a table or a backdrop, with some faint, illegible text visible.

- ◆ Creating original music that captures the complexity and emotional depth of human-composed pieces presents a significant challenge in artificial intelligence.

Solution Overview



DATA COLLECTION
AND
PREPROCESSING

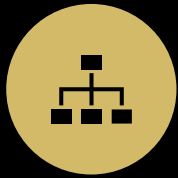


MODEL
DEVELOPMENT



USER INTERFACE

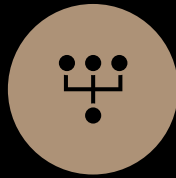
Functionalities & Stages



1. PROJECT
SETUP &
PLANNING



2. DATA
COLLECTION &
PREPROCESSING



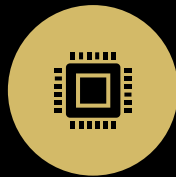
3. MODEL
SELECTION &
TRAINING



4. EVALUATION
& REFINEMENT



5. USER
INTERFACE
DEVELOPMENT



6. DEPLOYMENT
& MONITORING

Frontend



User Interface (UI): Visual elements like buttons, sliders, and forms through which users input their preferences (genre, tempo, mood) and interact with the system.



Visualization Tools: Displays for showing the structure and components of the music being generated, such as waveforms or sheet music previews.



Input Validation: Ensures that user inputs are valid and within acceptable ranges before sending them to the backend.



Feedback and Alerts: Notifications and prompts that inform users about the status of their requests, errors, or next steps.



Responsive Design: Ensures the application is accessible across various devices and screen sizes, from desktops to mobile phones.

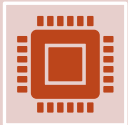
Backend



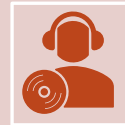
APIs (Application Programming Interfaces): Serve as the communication link between the frontend and the backend, processing requests and returning music compositions.



Data Storage and Management: Databases that store user preferences, session data, and potentially a catalog of generated compositions.



Music Generation Engine: The core AI models (e.g., GANs, RNNs) that analyze inputs and generate music based on learned patterns and user specifications.



Preprocessing and Analysis Tools: Software components that prepare and analyze input data (e.g., converting audio files to MIDI) for the AI models.

AI Features & Benefits

AI Features:

- **Generative Adversarial Networks (GANs):** Creates original music by training two neural networks in a competitive setup, enhancing the realism of compositions.
- **Recurrent Neural Networks (RNNs):** Captures the temporal dynamics of music, allowing for the generation of coherent musical sequences.
- **User Input Customization:** Tailors music generation to user preferences, adjusting for genre, tempo, and mood for personalized compositions.
- **Style Transfer:** Blends elements from different genres or artists, enabling creative and unique music generation.

Benefits:

- Innovation
- Customization

Conclusion

- ◆ This project merges technology and creativity, aiming to break new ground in AI-generated art by developing a system that not only produces original music across genres but also adapts to user preferences.

