SYMPHONY BY SEQUENCE

USING MACHINE LEARNING TO GENERATE MUSIC

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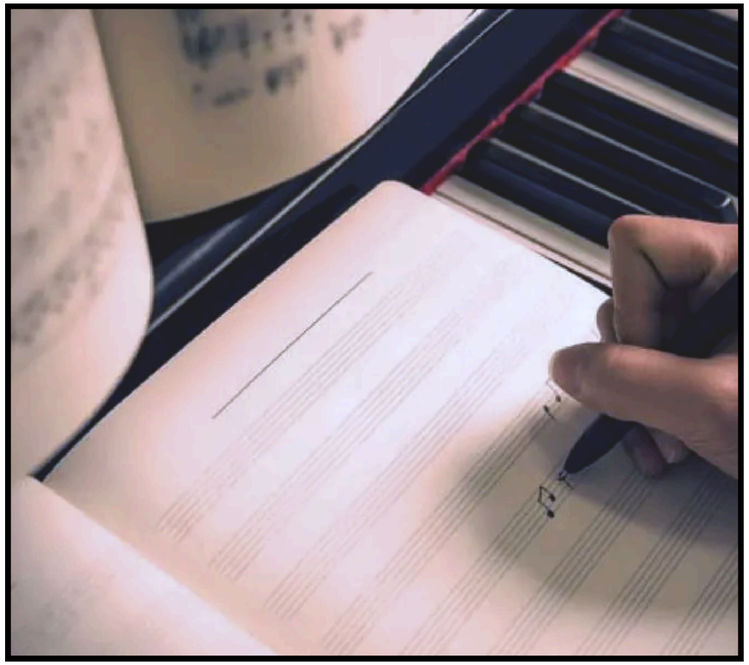
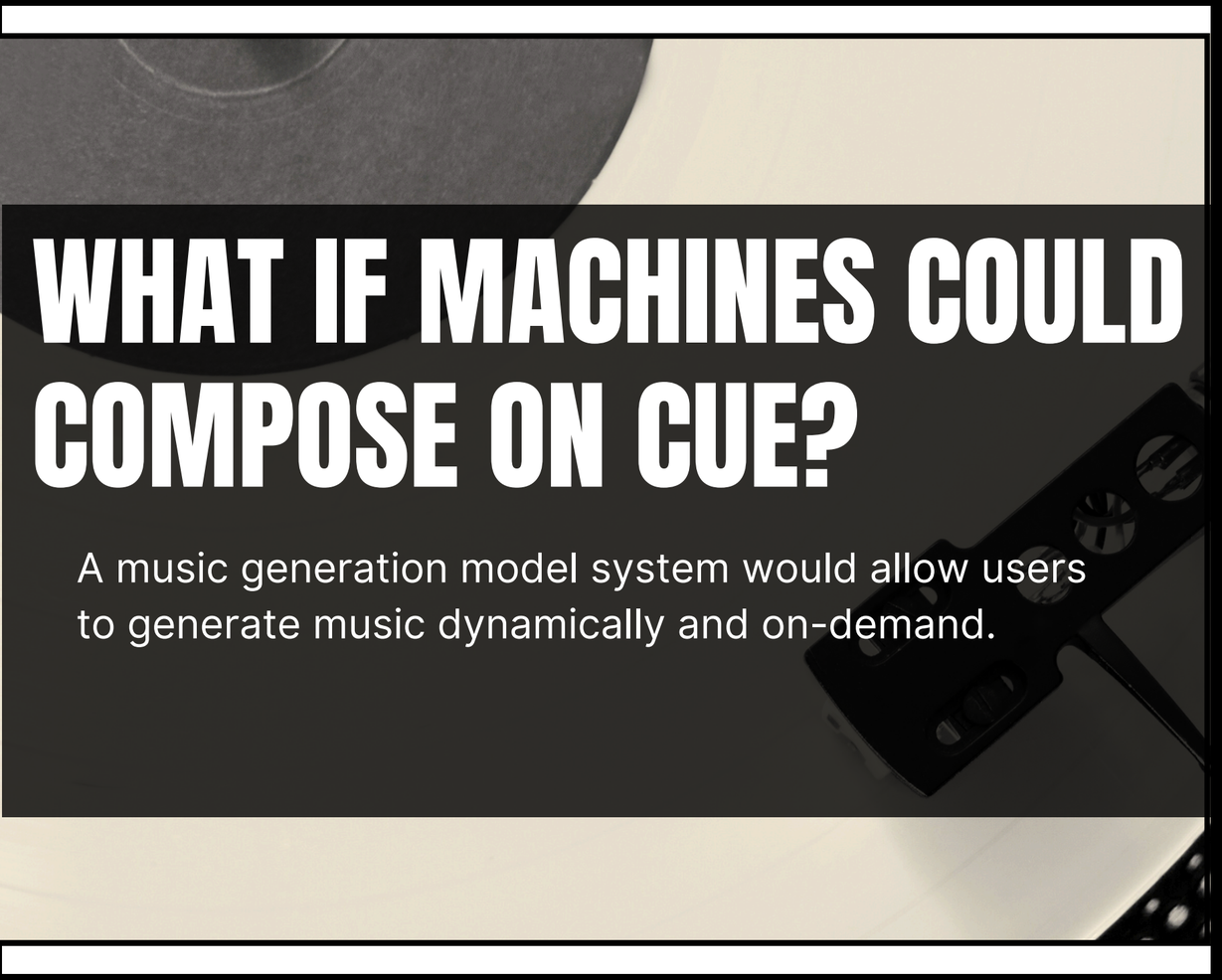
CREATING MUSIC TAKES TIME, PEOPLE, AND MONEY



Music is woven into nearly every aspect of daily life, shaping emotion, atmosphere, and experience in film, games, and social media.

Key Problems with Traditional Music Creation

- Creativity
- Licensing & Costs
- Time
- Scaling



WHAT IF MACHINES COULD COMPOSE ON CUE?

A music generation model system would allow users to generate music dynamically and on-demand.

BENEFITS OF AI GENERATED MUSIC

- Royalty-free music
- Fast turnaround
- Easy customization
- Scalability

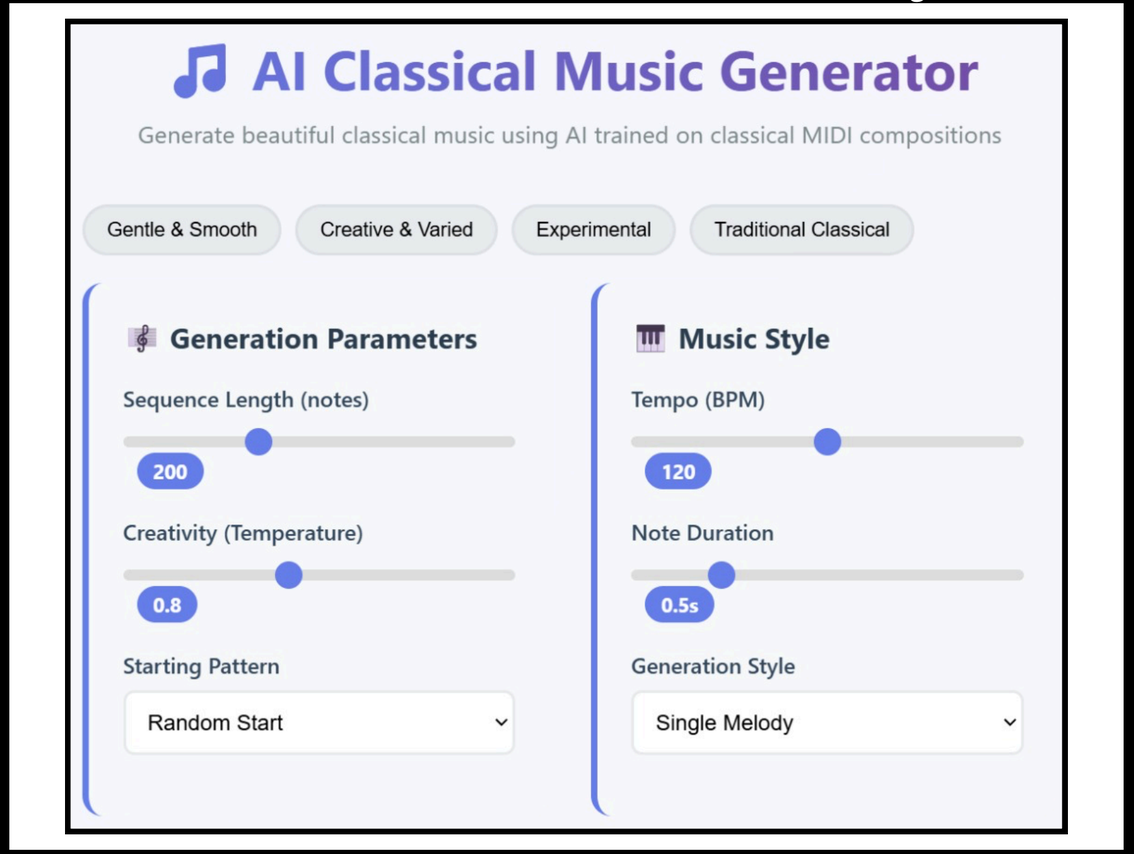
The music generator will understand and predict the next note in the cacophony of sound to create the best music to fit a user’s needs.

AI MUSIC GENERATION OFFERS CUSTOMIZED MUSIC

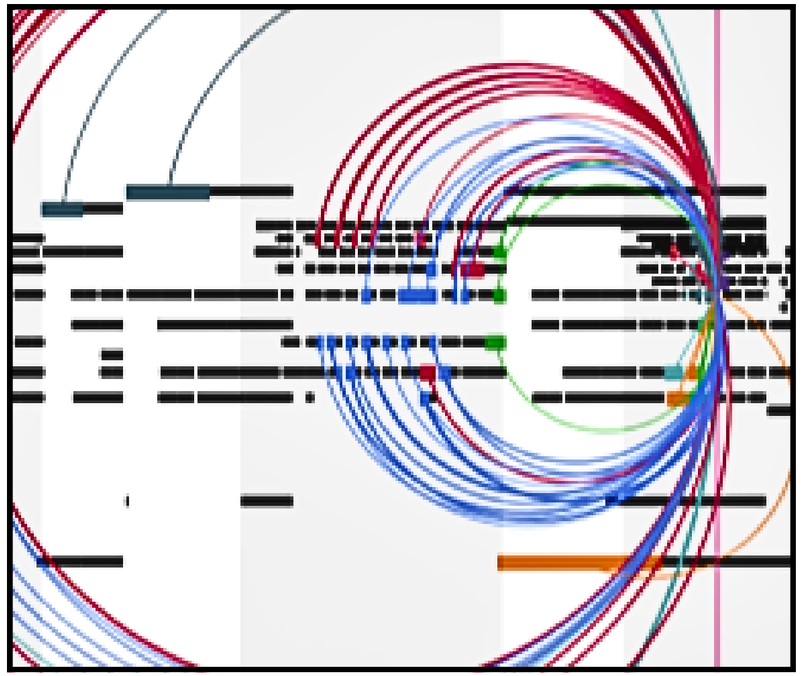
Customizable Features in the Music Generator

- Number of notes
- Creativity
- Tempo
- Note Length
- Starting Pattern
- Generation Style

UI for the music generator



With a music generator, anyone can easily create their own royalty-free custom tune to fit their personal or business needs.



https://magenta.tensorflow.org/music-transformer

SEQUENTIAL AND TRANSFORMER MODELS CAN CAPTURE RELATIONSHIPS IN SOUND

Since music is spatial and temporal, RNNs and transformers are ideal models to understand the relationship and context in music.

Pre-Trained Models Tested

- Recurrent Neural Network (RNN)
- Long Short-Term Memory (LSTM)
- Transformer

Goal

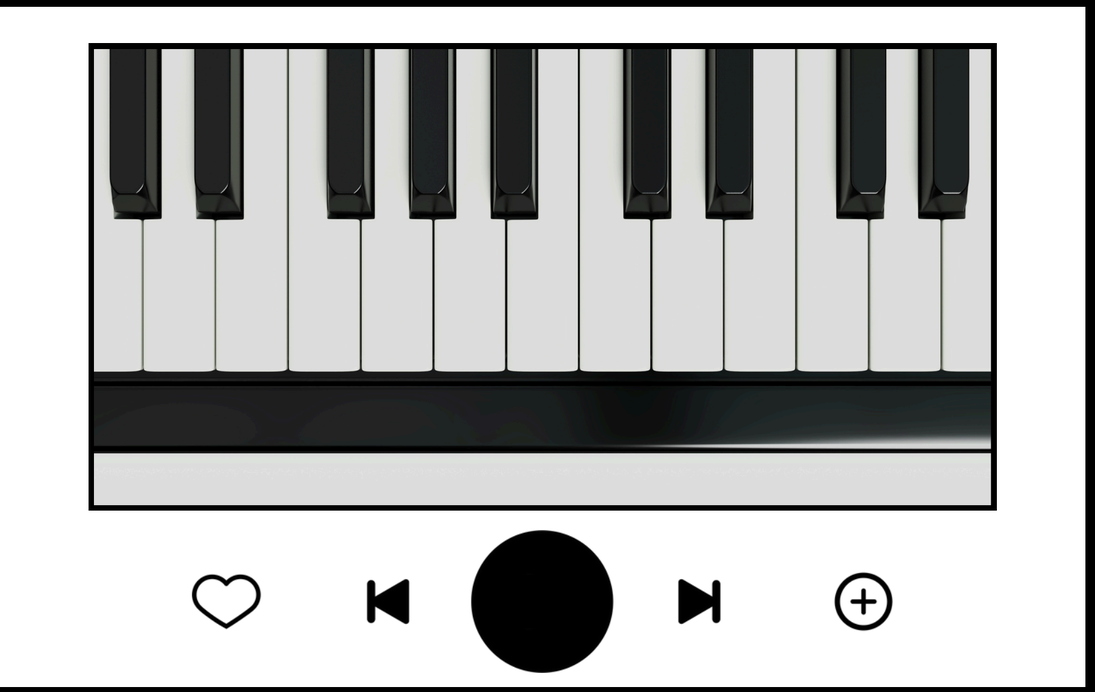
- Predictive Analytics: How well can the model predict the next note in generating music?
- How ‘good’ is the music generated by the model?

CLASSICAL MUSIC MIDI FILES WERE USED TO TRAIN THE MODEL

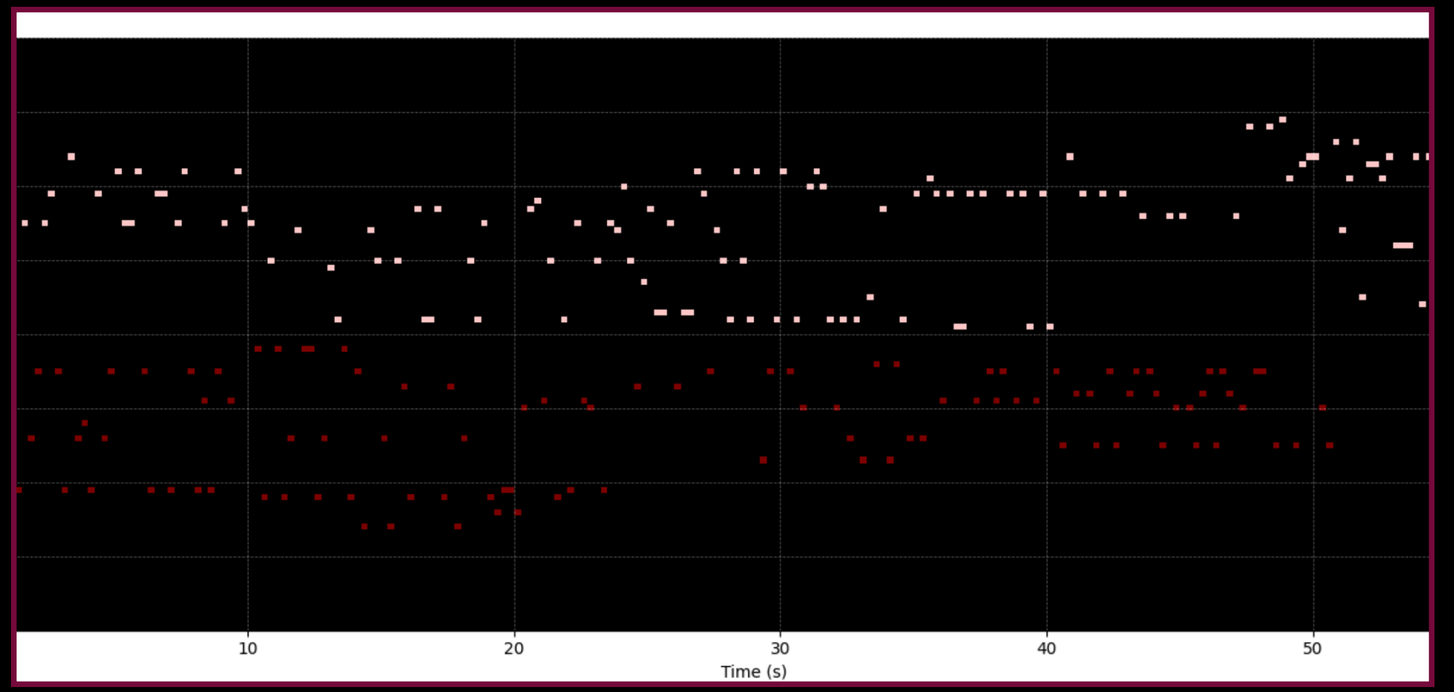
MIDI files contain rich information on the timing, pitch, and velocity of notes to capture **how** sound is created rather than the sound itself.

This data is converted into structured, encoded sequence of musical tokens to numerically represent the ‘sound’ captured in the MIDI format.

TRANSFORMERS YIELD THE MOST PROMISING MUSIC GENERATION RESULTS

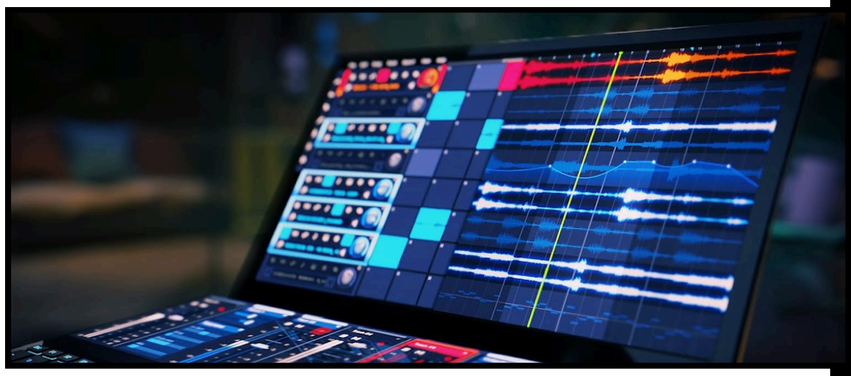


SAMPLE OF GENERATED CLASSICAL MUSIC



MIDI VISUALIZATION SEPARATED BY MELODY & BASSLINE

MUSIC GENERATION HAS POTENTIAL TO TRANSFORM THE MUSIC INDUSTRY



Machine-generated music prevents bottlenecks and creative delays involved in traditional music composition processes.

Scaling the model's training data to include other genres of music can increase the possibilities of music generated to increase quality and personalization.

This drives home the potential of Music-as-a-Service (MaaS) being established as a viable product in the near future.

THANK YOU!
ANY QUESTIONS?

Model data, metrics, and implementation discussed in report.