

Music Visualization using Deep Learning

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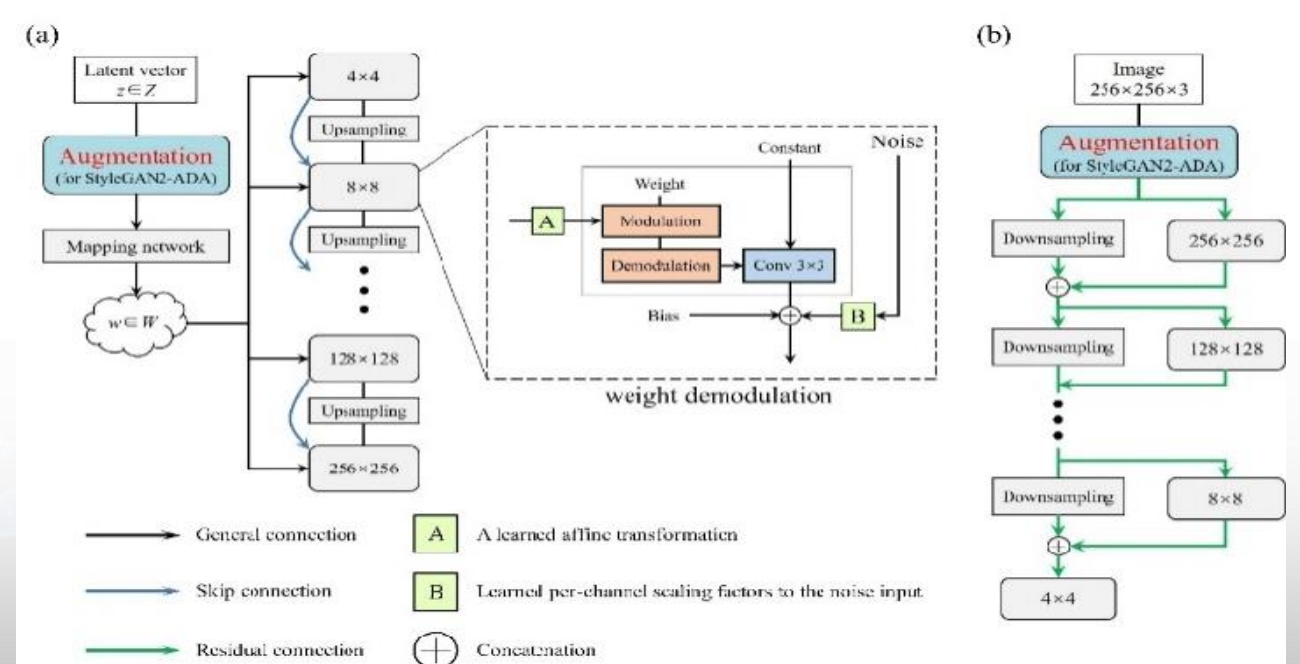
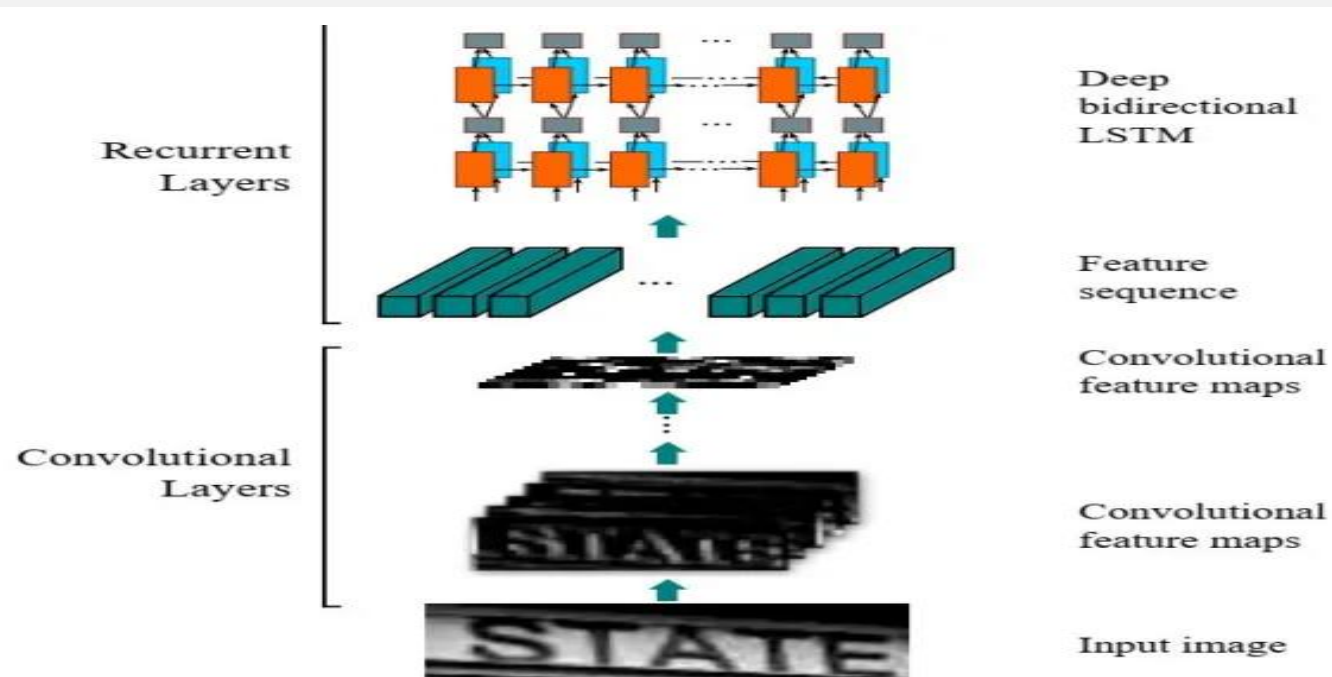
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Research Gap

Integrating music visualization with deep learning is a relatively untapped field. Using deep learning to create a more meaningful image could be extremely beneficial in capturing an accurate mental model of a musical fragment. The key issue with most of the existing visualization techniques is that they are either inadequate in capturing the music's entire repertoire of features and its meaningful essence, or they are extremely complex and abstract and do not translate to intuitive perception of music by the larger audience.

Objectives

- *Deep Learning*: Automate processing of song's audio features (the entire repertoire on Spotify Web API) and visualize it.
- *Visualization*: Generate visualization in the form of a static image inspired from albums' cover art.



CRNN Model Architecture

StyleGAN2 Model Architecture (a) generator (b) discriminator

Brief Methodology

1. Copy the Spotify URL / ID for the required song. Use the CRNN model to extract audio features.
2. Perform K-Means Clustering on the Spotify Albums Dataset. Analyse and Annotate / Give Values to each cluster.
3. Use StyleGAN2 to generate a static image / cover art from the cluster(s) the song matched.

Results

- ✓ Improved the efficiency and accuracy of audio feature extraction, and reduced algorithmic biases. Represented 11 audio features available on Spotify API.
- ✓ Used album cover artwork as a more effective standard to generate visualizations (See Video Demo)