Using Generative Adversarial Networks to Create Images and Videos

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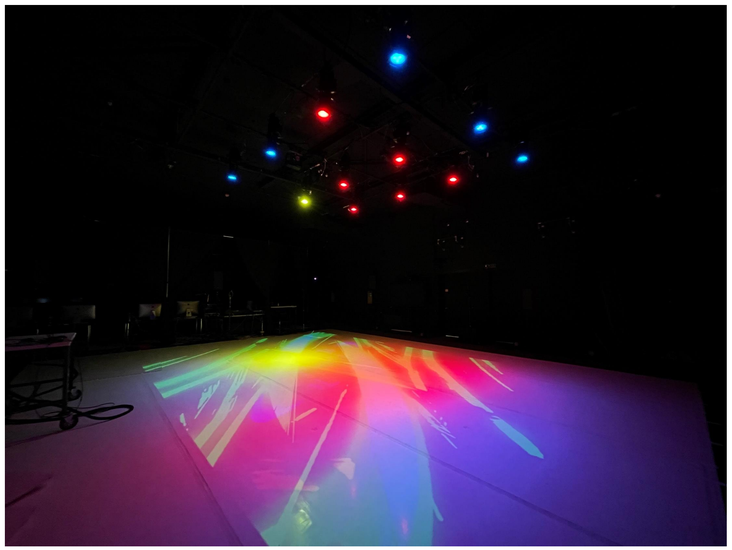
Objectives and Goals:

Creative Frameworks is a project born out of the desire to build inclusive solutions that augment human creativity. Using auditory analysis technology in combination with simplified control interfaces, traditional barriers such technical skill and expertise could be circumvented, allowing people to generate a light show with music driven through the user's input. To make things as accessible as possible, research was done to this end on taking user input from songs with text/lyrics as cues for an AI model, and various input mediums like a keyboard or motion capture to control lights.

Materials and Methods

Researchers pull musical information through the Spotify API and make use of information regarding tempo, beats, intensity, combined with scraping song lyrics and processing it all with an AI model to generate a light show. Additionally, Hollywood-grade motion capture cameras and input from a MIDI controller were mapped to lights and a recording function developed, enabling the generation of light shows with user directed input through a variety of mediums that can be played back at any time. Outputs are directed through the Digital Multiplex (DMX) standard, which is used in typical performance settings to control stage technology. Recordings are stored in a JSON file format and playback is multi-threaded, allowing multiple recorded files to be played at the same time. The testing stage used by researchers is the iStage at ASU's Matthews Center, which has the lights and sound equipment necessary for production.



Above: Visual generator and some lights running

Below: A user experiencing the visuals and lights

Results

The left shows some examples of light displays which have been produced. Additionally, lights have also been mapped to move and activate in different ways synchronized with a given song. Users have been able to successfully test and generate a light show with the given input methods and play them back at any time. The information is stored in JSON file format and runs on our custom-made programs to replay with its output through DMX.

Conclusions

The goal of the project was to develop accessible ways for users to creatively express themselves and focused specifically on lights with auditory analysis. A series of interconnected Python scripts allows users to give input through a keyboard, MIDI controller, or even motion capture to control light motion, colors, intensity, and activation, lowering the access point from typical complex lighting control systems and enabling more people to use the system. Future research could research more diverse input methods for better user experience and improvements on the model for better automated generation.

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