Ryan Bentz
Ram Bhattarai
ECE 558
Speech Driven Light Show
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FINAL PROJECT: PROGRESS REPORT

Hardware:

The hardware portion of the controlling the LED's is not going as well as hoped. We are using a TLC5940 16-channel PWM LED drivers to control the LEDs and produce the custom colors chosen by the user. We currently have a setup where a Raspberry Pi receives the lightshow/color data from the database and after some algorithmic modifications, sends it to an Arduino Uno which handles the low-level control of the TLC5940.

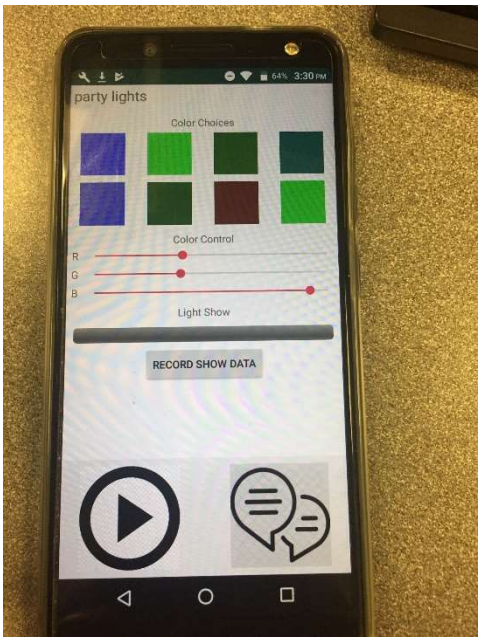
Using the TLC5940 has been challenging. We have written a custom driver for the TLC5940 that partially works so far. We can turn on all LED's and do simple chase sequences of single colors. But, we have not achieved full control over selecting LED's to turn on and correctly setting the colors. Based on our understanding of the datasheet and being able to make chase sequences, getting RGB values should be trivial but, so far, it has proven more difficult than anticipated. Controlling a single TLC5940 has been pretty straightforward, but it seems like chaining multiple devices together increases the problems so we will have to try and simplify back to the basics and try to scale up again.

Needs to do:

1. Scale TLC5940 back to single device and confirm full control of RGB values
2. Scale up to 3 devices daisy chained and confirm full control
3. Write the code and build the lightshow

Software:

We are mostly done with the software part. When you press on the speech listener and speak to it, it listens and stores that in the recyclerview lists. When you click on newly added entry, it gives you a new screen where you can create your own lightshow by choosing the RGB values to each box. There are 8 color boxes which will be used to create the Lightshow. The picture is added below.



For each color box that you select and make some changes in RGB values, they are put in to database for future use. Currently, each values are getting stored properly in database, but when trying to read them back when you open the app is not updating the recycler view properly. Researching online, there was a note saying that we have to create our own adapter to save and retrieve the data because the Firebase adapter for recyclerview does not exist. So, we need to do some more research or figure out an idea to handle that issue.

Needs to do:

1. Fix the database issues: When you open the app, if there are contents in database, it should open the app with the contents in the recycler view rather than having the dummy list with no datas in recycler views.
2. Additions if we have time: If the colors are already filled and the recyclerview has new info, just saying the name will start the light show using the speech recognition.
3. Add viewpager navigation with recylerview and fragments for each word/lightshow.