Final Pi Project Report

COSC 1352 - Spring 2019

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Team "This Is Fine"

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Project Description:

If you have gone to any sports game recently, you may have noticed that occasionally a noise level indicator showing the decibel level of the crowd's cheering is shown on the monitors in order to hype up the crowd. These stadiums may be using a system from a company called Uplause, a global group known for their broadcast-grade audience interaction software. Their software not only monitors how loud the crowd cheers for each player but also can send a social media message whenever the average noise level is higher than the previous record for that stadium. This inspired our team to attempt to build a similar system for the HBU Huskies football stadium on campus.

Our device consists of a Raspberry Pi 3B+, a small LCD touchscreen, a Maxim MAX4466 microphone/amplifier breakout board, an MCP3002 ADC IC, and a Logitech Pro 9000 USB webcam. The Raspberry Pi uses the analog voltage readings from the MAX4466 to determine the ambient sound level around it at a regular-season HBU Football game. It writes the data to a ".txt" file to allow persistence between reboots and constantly checks if the next value read is higher then the current value in the text file. If so, the Pi snaps a photo with the webcam and attaches it to a tweet with important data like opposing team, current date/time, and a randomly selected HBU cheer (ie: "Dawgs Up" or "Go Huskies").

The Raspberry Pi does not have any analog inputs, but since we are using an analog microphone, we have to use an ADC (Analog to Digital Converter) IC to read the analog values from the sensor and send it to the Pi using SPI through the digital pins.

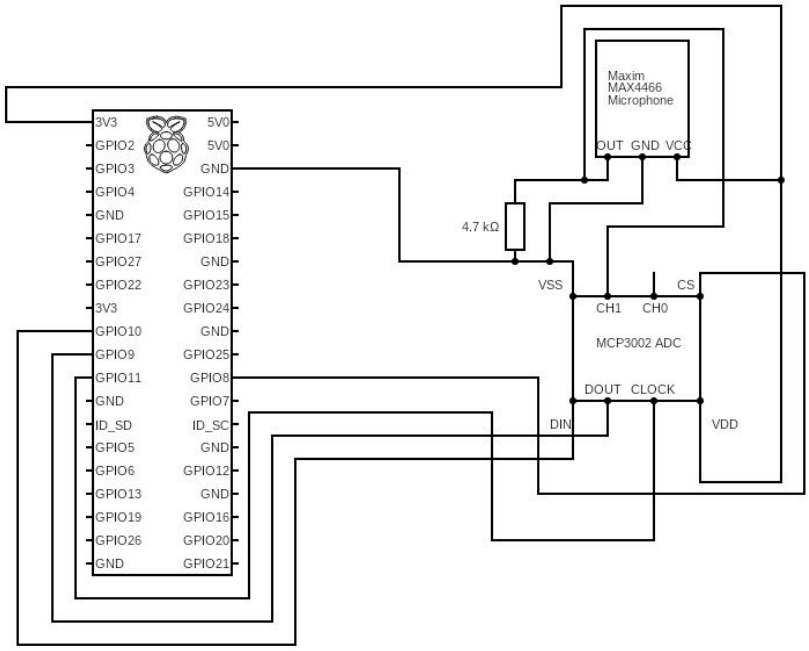
Major Components:

- Raspberry Pi 3B+
- Logitech Pro 9000 USB webcam
- MCP3002 ADC IC
- Maxim MAX4466 Microphone breakout board

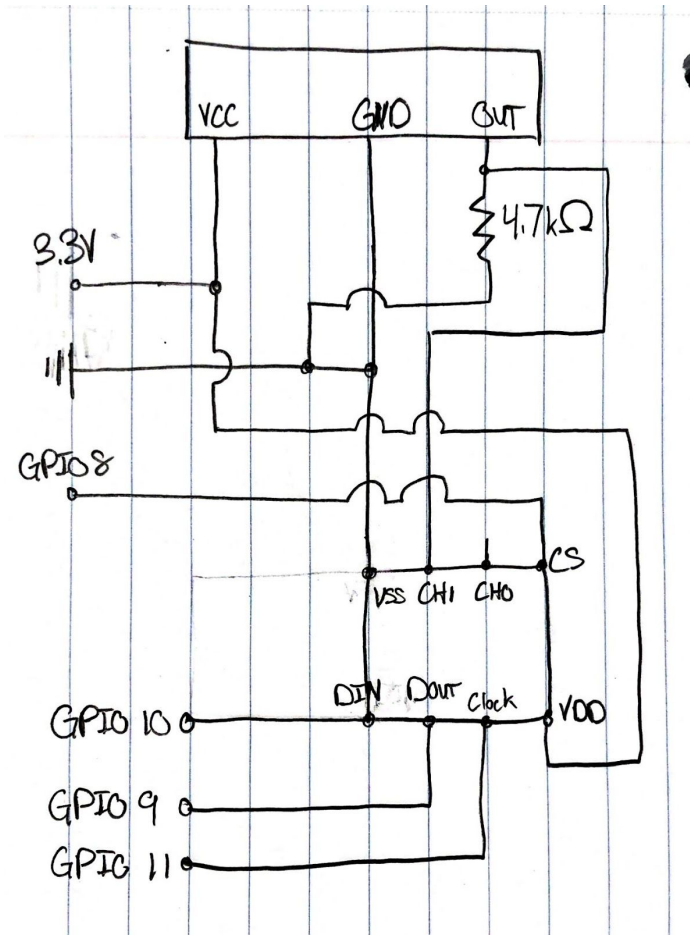
Layout of Document:

- Circuit Diagrams
- Bill of Materials
- Final Presentation Slides
- Source Code

Circuit Diagram



Layout Diagram



Bill of Materials

- Raspberry Pi 3B+ - $35.00 - Adafruit
- Logitech Pro 9000 USB webcam - ~$30.00 - Amazon
- MCP3002 ADC IC - $2.30 - Sparkfun
- Maxim MAX4466 Microphone breakout board - $6.95 - Adafruit
- Miniature 170-point Breadboard - $6.99 - Amazon
- Assorted Jumper Wires - ~$8.00 - Amazon

Also Needed to Function:

- Any USB keyboard
- Any HDMI-enabled monitor
- (OPTIONAL) USB extender cable for webcam

Source Code

This code has also been turned in on Blackboard and is stored on my Github Page,
https://github.com/nickdrones/HBU-Crowd-Cheer-TweetBot

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