So-Lo

Team 12

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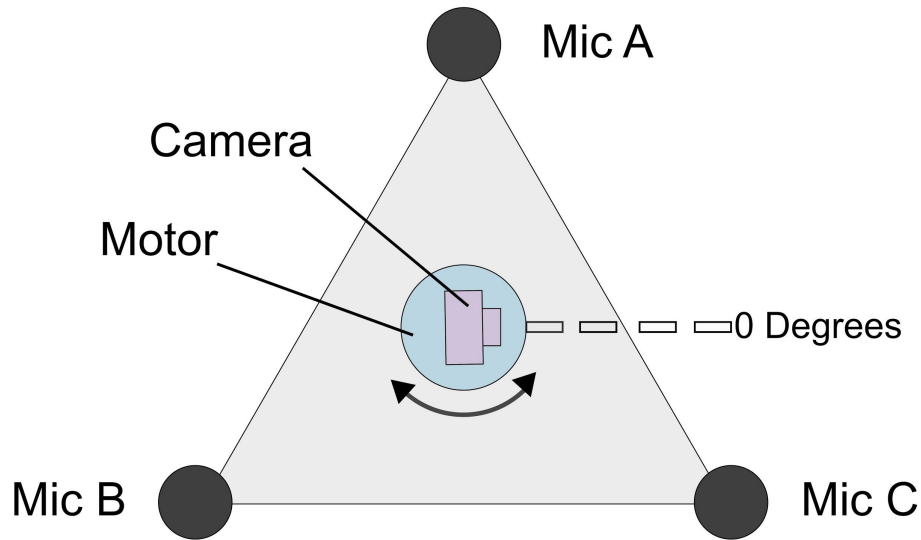
Presentation Overview

- Project overview

- FPR Deliverables

- Demo

What is So-Lo

- Automatic Video and Audio recorder used for meetings

  and conferences

- Real-time sound locator

- Effective in small to medium sized rooms.

How Does So-Lo Work?


Mic A

Camera

Motor

0 Degrees

Mic B

Mic C

- 3 Electret Microphones are used to detect sound
- the location of a speaker is calculated with Time Difference of Arrival (TDOA)
- A camera is mounted onto a motor turns to the speaker

- Video and audio is stored on an SD card on the Raspberry Pi.
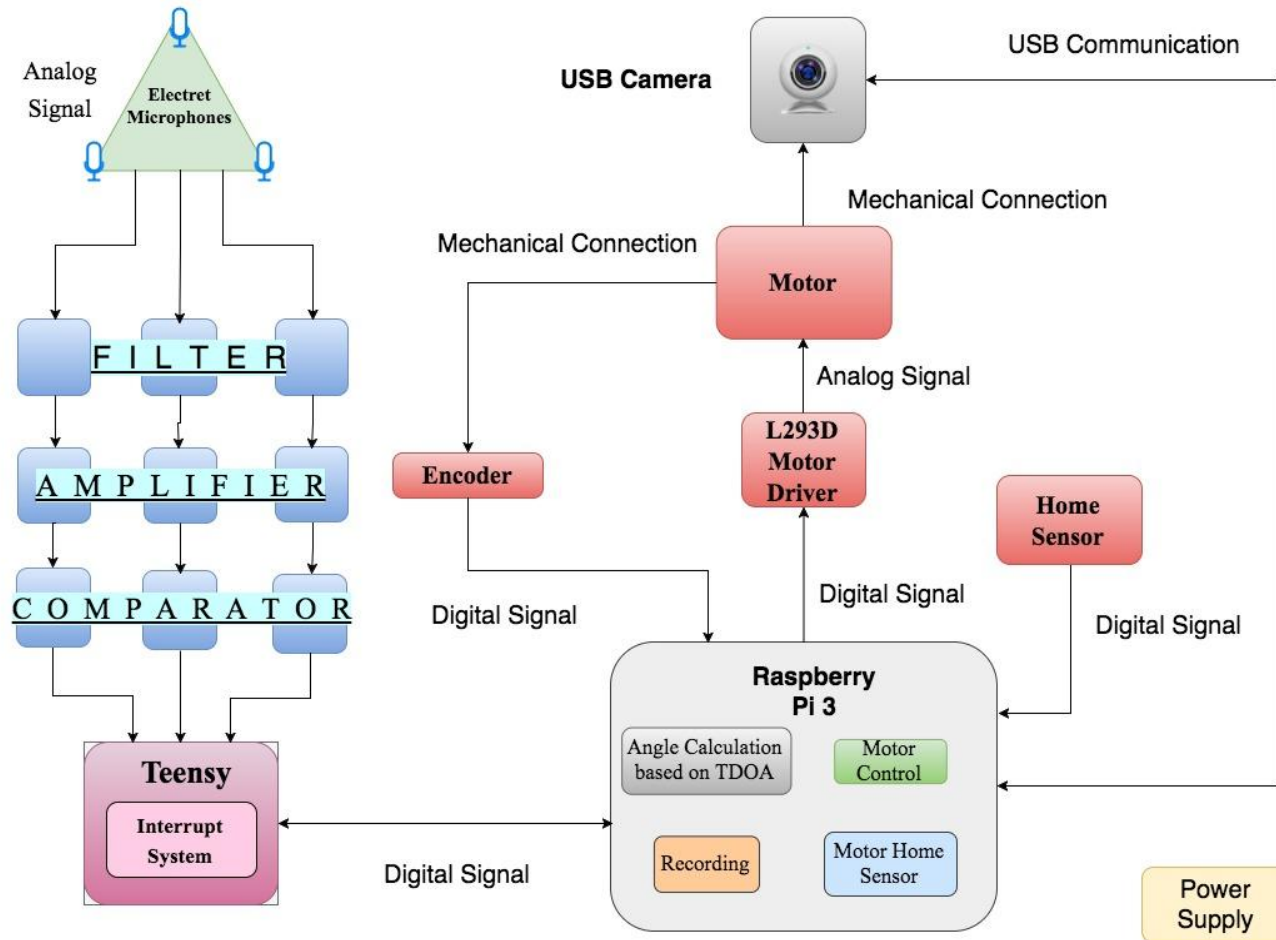
Addition to the System

- Teensy 3.5
  - replaces the RPi to handle microphones interrupt system.
  - Fixes the delay problem that affected angle calculation
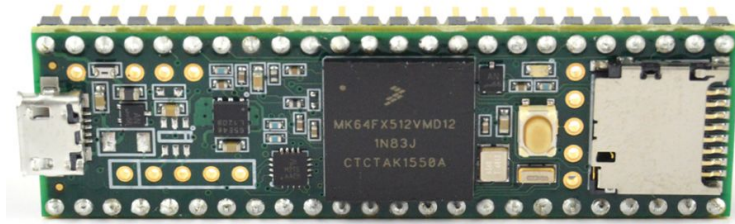
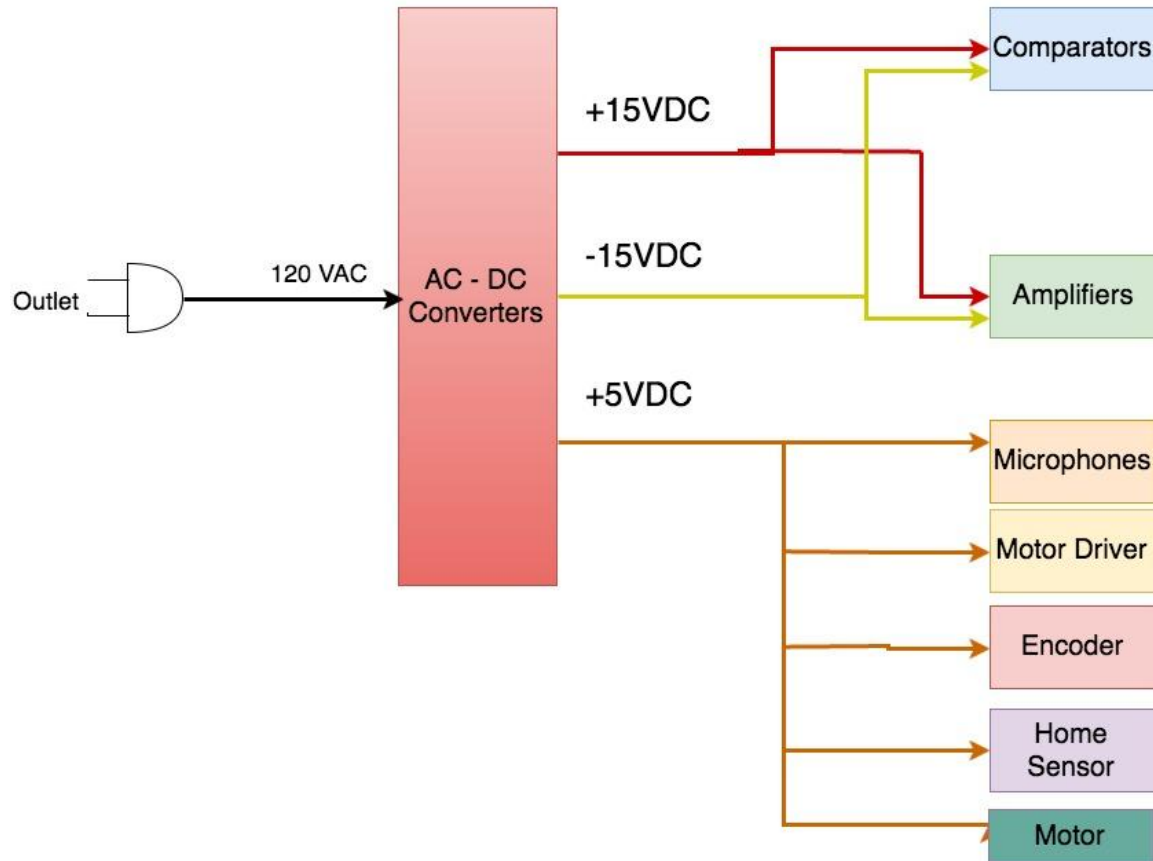- Optical interrupter switch
  - Allows to have a home position
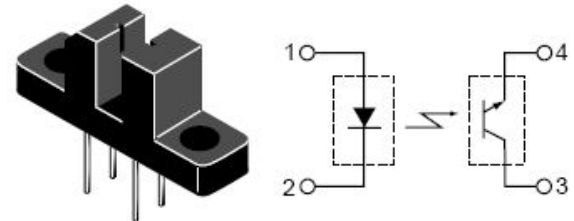
Block Diagram

Power Supply Block Diagram

Triple Output Power Supply

System Requirements

- Find source of sound based on time differences between microphones located at a known position.

- Microphone Array
  - Detect sounds from 3 feet away
  - Amplify voice and filter out noise.

System Requirements

- Raspberry Pi
  - Use microphone array outputs to calculate sound source location

- Motor
  - Turns to the angle given by the Angle Calculation Code

- Camera
  - Record video and audio with the camera and save data on an SD card.

FPR Deliverables

- Full System Integration

- Accurately point to the source of sound (speaker)

- Microphones assembled on acrylic 1 foot away from each other

- Filter, Comparator, and Amplifier assembled on PCB

- Triple output Power Supply

Project Cost

Item	Qty	Price Per Unit
Electret Microphone	3	$7.95
Raspberry Pi Model 3	1	$35
Teensy 3.5	1	$25
USB Webcam	1	$15
Triple output Power Supply	1	$16
DC Motor	1	N/A
Optical Interrupter switch	1	N/A
Optical Encoder	1	N/A
Motor Driver	1	N/A
Quad OPAMP	2	N/A
Comparator	3	N/A
	TOTAL	**$114.85**

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Demo Video Back-up