

Project Proposal: Boo-Bot

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CS 370

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Project Objective

The goal of this project is to create a small, remote controlled robot. This robot, nicknamed the “Boo-Bot” by the authors, will be capable of sending real-time video/audio and taking real-time controls over the internet, allowing it to be controlled from anywhere with a network connection. A specific goal is to allow this bot to be controlled via Twitch live-stream chat, yielding more participation during demos.

This project will be made as from-scratch as possible, with circuitry, drivers, and communications being designed and implemented throughout the course of the project wherever reasonable. We aim to make this as quality and clean as possible, leveraging the Electrical and Computer Engineering skills of the authors.

The primary board is currently planned as a Raspberry Pi 3 Model A+ running stock Raspbian Lite. Programming will be done in multiple languages (Rust, C, perhaps Python) and take advantage of inter-process communication as learned in class or via FFI bindings.

Members

Members of this project are as follows:

- Daniel Garcia
- Devin Pohl

Software Required

Overview

Justification

Hardware Required

Overview

Justification

Bill of Materials

Below is a bill of materials for this project, including all hardware used. All components are purchased from various EBay stores, with shipping times between one and three weeks.

Amount	Component	Price Ea (\$)	Description	Cost (\$)
2	Drivers	3.16	A4988 Stepper Motor Driver Module	6.33
2	Motors	3.98	MINEBEA NMB 2-phase 4-Wire 18° Stepper Motor	7.96
1	Amp	4.99	MAX98357A I2S Class D amplifier	4.99
1	Speaker	0.99	8 ohm speaker	0.99
1	Lipo	15.05	Lipo battery pack	15.05
1	Microphone	7.51	I2S MEMS Microphone SPH0645LM4H	7.51
1	Voltage Regulator	0.79	3-24V to 12V 2A Adjustable Boost Step-Up Converter	0.79
10	Capacitors	0.466	16v 1000UF Electrolytic SMD	4.66
1	Raspberry pi	29.99	Raspberry Pi 3 Model A+ 2018 model	29.99
1	9-axis MPU	4.60	MPU9250 (Gyro, Accelerometer, Compass)	4.60
1	ADC	1.69	INA219 DC current and voltage sensor	1.69
			Total:	84.56