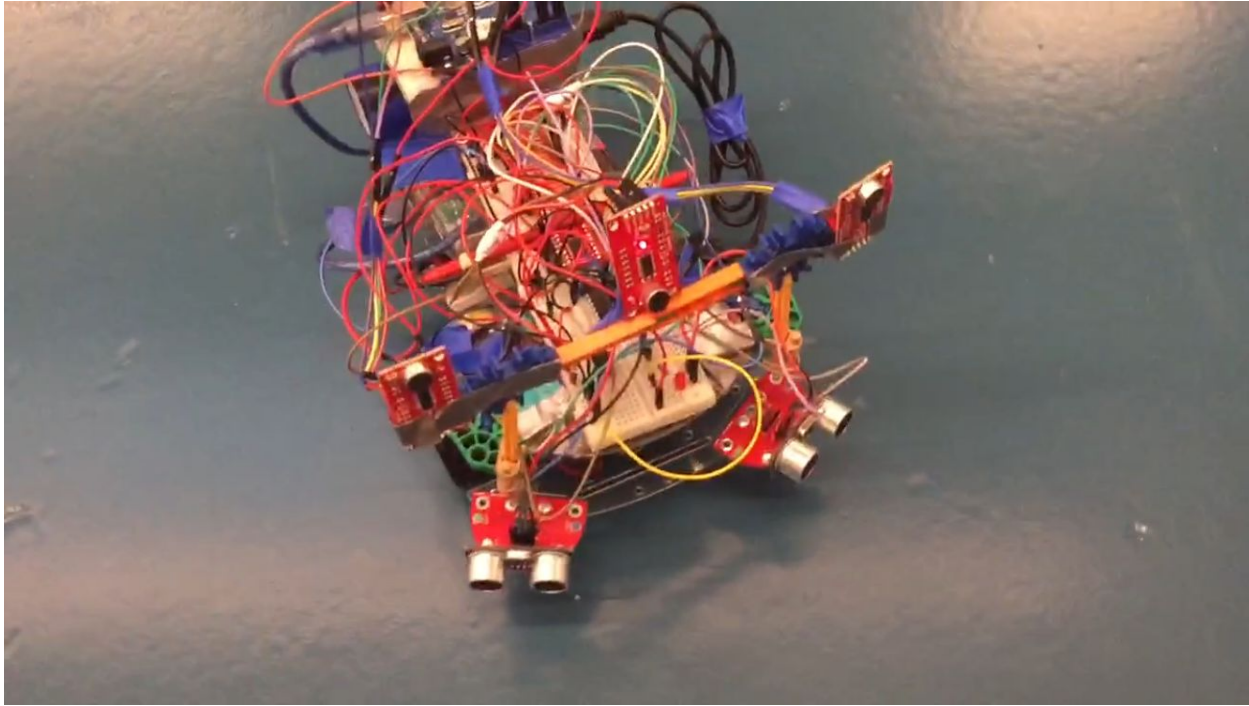


BEDHEAD

Helper and Entertainer



THIS IS BEDHEAD



THE

FUNCTIONS



As a finite state machine, Bedhead is able to perform various tasks that give itself either practical use or general amusement. Using sound as a basis of its design, this machine is able to incorporate analog functions that enhances flexibility and refinement in its actions. The intensity of the sound waves are used as a way to produce these adjustments, acting a bridge from the user to the machine itself when it comes to usability.

Bedhead incorporates two modes of actions, one of which has been designed to act upon user command (giving the most user flexibility) and the other designed for general amusement (acting as more of a demonstration of the capabilities of Bedhead hardware in a more amusing fashion).

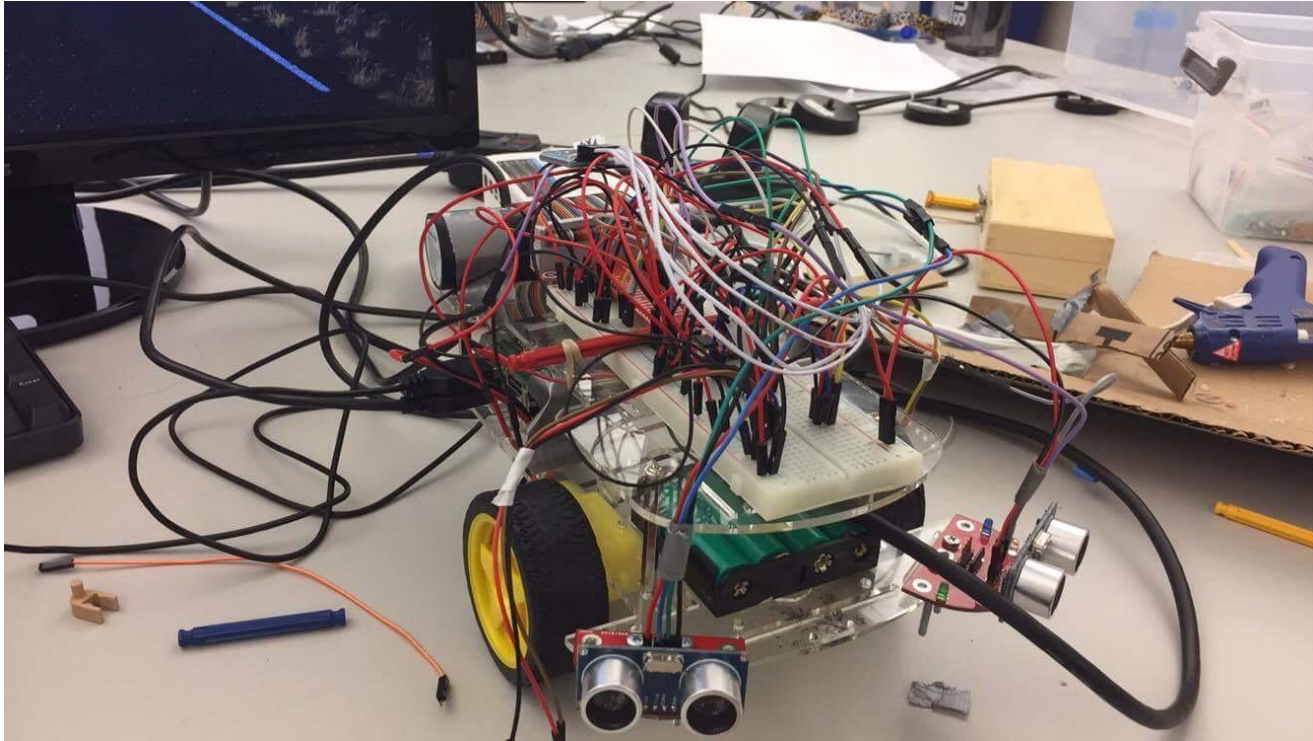


HARDWARE

- Ultrasound sensors - used to detect distance from close objects. In this showcase, the sensors detect objects within a certain distance, signaling certain appropriations be made in response
- Sound Detectors - used as the core feature, giving usability of the machine without physical contact
- Motors - used to allow motion. Two motors have been used in order to enable movement
- Raspberry Pi - used as the “brain” of the machine, running the program (written in Python) while connecting all other hardware.
- Arduino - used as the secondary computation hardware which, in this case, calculates the readings of 2 sound detectors (3 total) to perform a (simplified) version of sound localization



DEVELOPMENT



BEDHEAD IN EARLY DEVELOPMENT

THE FIRST STAGES

- Bedhead came about from an idea to create a sound-operated robot
- It was originally designed to move towards the direction of a sound through sound localization, hence the design of the robot to have two microphones in the shape of some ears
- http://www.laurentcalmes.lu/soundloc_basics.html
 - This was part of the research done in order to figure out how to implement sound localization.
- Unfortunately, there were issues with the hardware:
 - The sound detectors were not picking up the sound wave in one “ear” first and then the in the second, which made it impossible to detect the angle in which the sound wave came from.
- Fortunately, a sound localization technique through the intensity of the sound was possible, so that was used instead.

THE NEXT PHASE.

- As development went on, it was decided that it would be best to make bedhead into a multi-purpose robot.
- Hence, more functions were added in order to make Bedhead into the most useful and entertaining robot possible.
- From this, Bedhead was developed to have two modes: Helper and Entertainer

HELPER

- In this mode, Bedhead is able to move around based on the sound intensity that it picks up
- Moves forwards and backwards based on the number of claps done (one and two respectively) and can move left or right using sound localization.

ENTERTAINER

- On the other hand, Bedhead can move perform various acts and tricks based on the number of claps done (and randomly after the first action)
- Has multiple actions that were designed to demonstrate the abilities of bedhead.
 - Ex: ultrasound detectors to avoid obstacles.