



Introduction

The project I worked on was to use robots to help in a guided meditation through haptic feedback. Robots have been used for guided meditation before but have only been capable of giving verbal feedback. I used Arduino to build an inflating and deflating device to add to our robot. The inflating and deflating of the device should be able to guide the person's breath to follow the meditations. The device is designed to look like a floatie. The code is remade from the original floatie program. The device is put on the Blossom robot, which can have audio added to have verbal guided meditation.

Skills Learned during SHINE

Laboratory skills:

- Learned how to code using Arduino to program robots
- Learned how to debug code lines
- Learned how to connect different components using electronic wires

```

New_Blossom
1~ (1 mpr.begin()) {
Serial.println("Failed to communicate with MPRLS sensor, check wiring?");
while (1) {
  delay(10);
}
}
Serial.println("Found MPRLS sensor");
}

void loop() {
float pressure_hPa = mpr.readPressure();

if(digitalRead(2) == LOW){
  if(Push == true){
    if(full == false){
      full = true;
      Push = false;
      Serial.println("InFlating");
    }
  }
  Serial.print("Pressure (hPa): "); Serial.println(pressure_hPa);
  Serial.print("Pressure (PSI): "); Serial.println(pressure_hPa / 68.947572932);
}
}
  
```

Figure 2. Example of an Arduino code I wrote this summer.

Additional Skills:

- Learned how to evaluate scientific literature related to the project
- Learned how to solder wires at USC's Baum Family Maker Space
- Learned how to prepare for college application
- Learned how to communicate about own research

How This Relates to My STEM Coursework

My time at SHINE taught me to code robots that I could use for my school's robotics team. I could use my new skills to help debug the robot and redirect the controls. I also plan to use my new coding skills to start other robot projects in the future.



Figure 3. Example of robotic component on Blossom the robot.

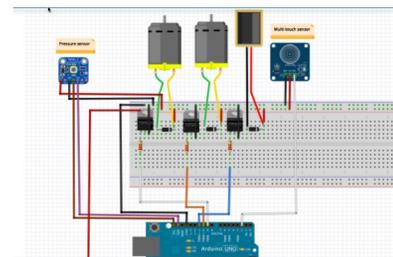


Figure 4. Example of modified Arduino board for the floatie.

Advice for Future SHINE Students

If I have any advice to give to future SHINE students, it would be to always ask questions. It is always helpful to know precisely what project you are working on and how your project will benefit society.

Another piece of advice I would give is that SHINE students should be able to visit other labs while you are able to visit the campus. They should be able to see other fields of STEM and be inspired by others' works. Another piece of advice is to start your poster early and add to it as you progress in your project. During the Friday shine meetings, you should be open and socialize your learning with your peers.



Acknowledgements

I would like to thank my mentor Massimiliano and my professor Dr. Mataric for letting me join the lab this summer. I would like to thank my center-mentor Mrs. Emelle for looking out for me during SHINE.

Objective & Impact of Professor's Research

Professor Mataric's research focuses on improving society through the real-world uses of robots. She researches how machines could be used to help the daily lives of everyday people through social means. The robots have a particular emphasis on helping those with special needs in learning and communication.



Figure 1. Example of a robot in the USC Interaction Lab.