

Tandem bike for autistic person (Team Tandem)

Team Members:

Callie Mataczynski - *Team Leader*

Eric Arndt - *Communicator*

Aaron Wagner - *BWIG/BPAG/BSAC*

Mengizem Tizale - *On Co-op*

Client:

Michael YuenHurwitz, Noah

Advisor:

Professor Beth Meyerand

Presentation Overview

- Problem Statement/Background
- Why should we care
- BME 400
- Specific Goals and timeline
- Other info
- Budget

Problem Statement

- Our client is a man with autism
- Want to develop a tandem ebike
- Operated by an assistant
- Allows for client to exercise

Background

- Autism
 - Developmental disorder
 - Difficulty with social interaction
 - Spectrum
- Three main components to this project
 - Frame
 - Resistance mechanism
 - User interface



<https://www.prioritybicycles.com/products/embark>

Why Should We Care?

- Autism should not hold back from life
 - Still enjoy the things they like to do
 - Increased happiness in individual with autism also decreases family stress.
- Health is important aspect of mental disease
 - If the body is healthy the brain is able to function better
- Project Focus Extends beyond this individual
 - Cerebral palsy
 - Muscular dystrophy
 - General Health



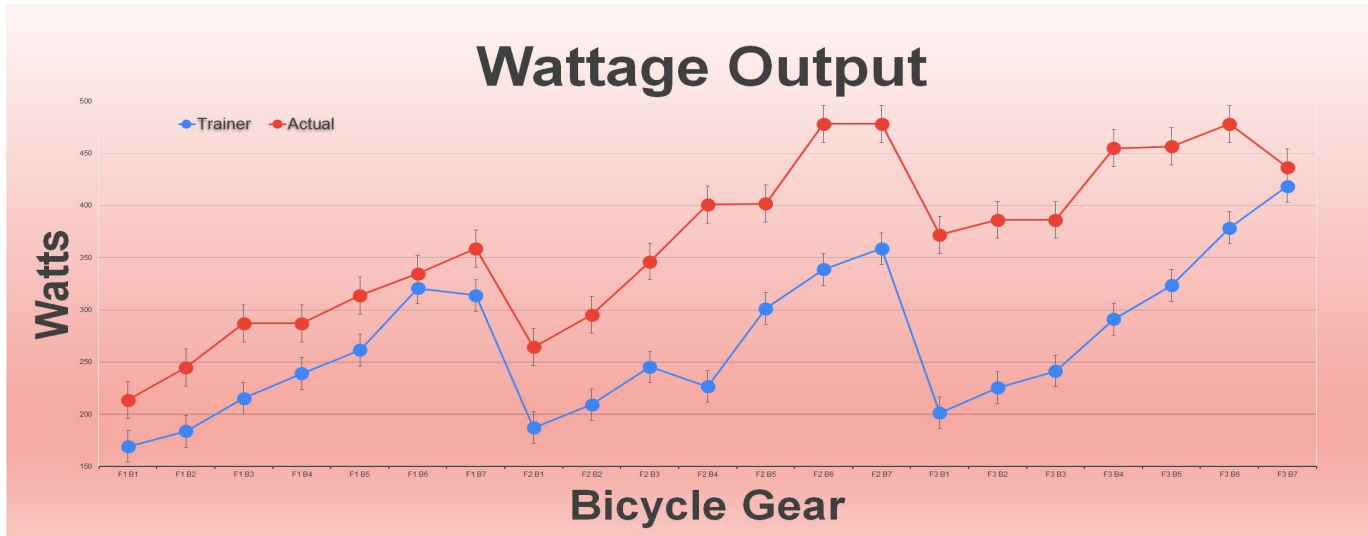
Prototype From Last Semester

- Focused on the frame and resistance mechanism
- Good understanding of the design of our frame
- Resistance mechanism is a work in progress



Testing

- Demonstrated that the wattage output of riding an actual bicycle is similar to the wattage output from a resistance mechanism

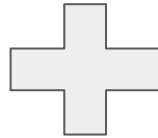
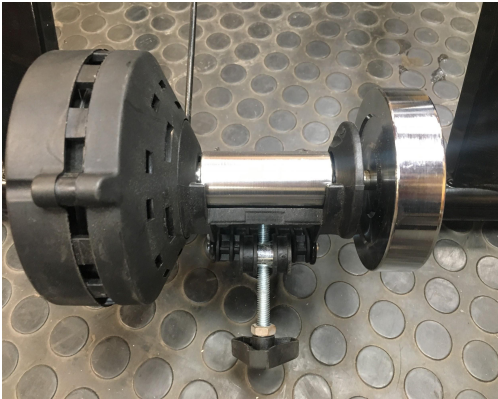


Semester Goals

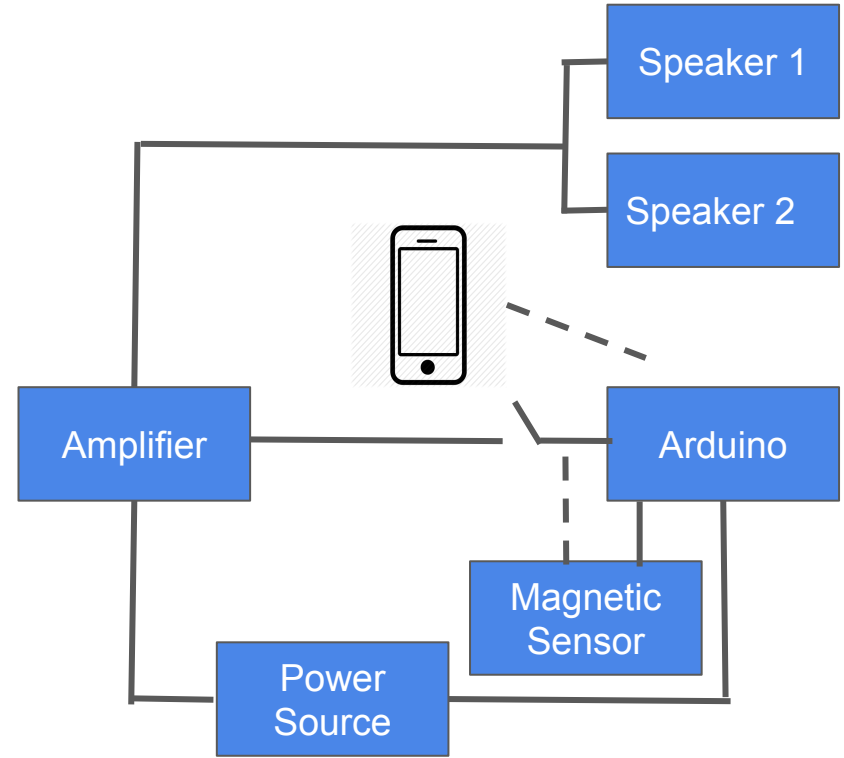
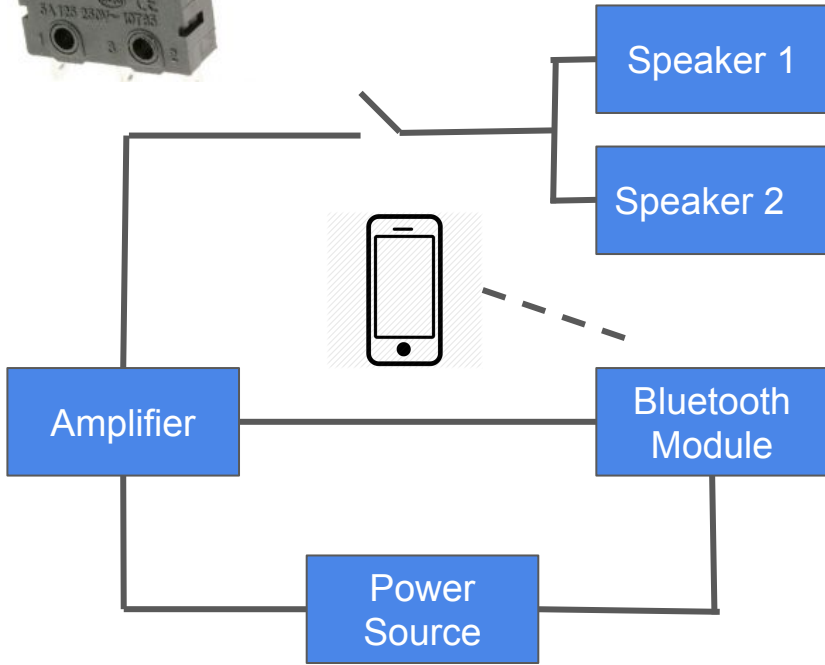
- Perfect the resistance mechanism
- Develop a desirable user interface for our client
- Perform further testing to ensure satisfaction of device

Resistance Mechanism

- Currently does not provide enough resistance
- Need to add some other type of resistance mechanism to magnetic resistance



Audio Feedback Flow Diagram

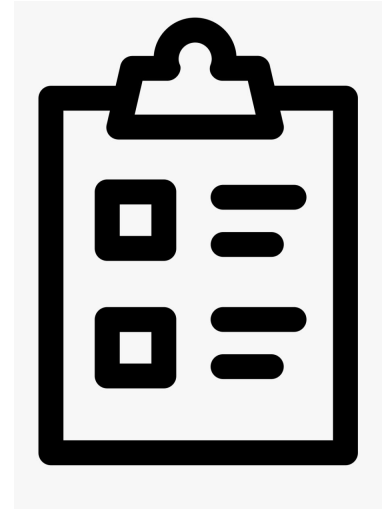


Miscellaneous Attachments



Documentation

- Audio feedback system user manual
 - Arduino code walk through
- Resistance mechanism maintenance
- Safety cautions



Budget: \$5,000

Items	Cost	Adjusted Budget
	\$557.52	\$4,442.48
Audio Feedback System	\$50 - \$200	\$4,242.48 - \$4,392.48
Miscellaneous attachments	\$200 - \$300	\$3,942.48 - \$4,192.48
Electric Trike	\$3,500	\$442.48 - \$692.48

Acknowledgements

- Clients: Michael YuenHurwitz, Noah
- Advisors: Professor Beth Meyerand, Dr. Christopher C. Luzzio

References

- “PRIORITY EMBARK E-BIKE.” *Priority Bicycles*, <https://www.prioritybicycles.com/products/embark>.
- “What Is Autism?” *Autism Speaks*, <https://www.autismspeaks.org/what-autism>.