To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, IE Capstone Design Programs

Team #28: Moonwalker Robotic Skates

Evan Guinta (ME), Jesse Kliebert (ME), Matthew Ohrberg (EE)

Background

- **Last Mile Problem**
  - After commuting by car, bus, train, etc., most people still have to travel a little further to get to there final destination.
  - For that last part of the journey, will the commuter walk, bike, or skateboard?
- **Objective Statement**
  - Design and prototype a solution for the last mile problem.
  - This design will have two wheeled platforms that can be easily worn over ones shoes.
  - This design will have an electromechanical system that will propel the user forward.

Competitors

RocketSkates

www.google.com, keyword: RocketSkates

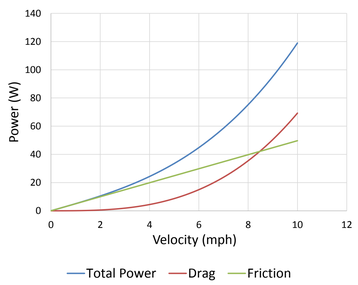
Boosted Board

www.google.com, keyword: Boosted Board

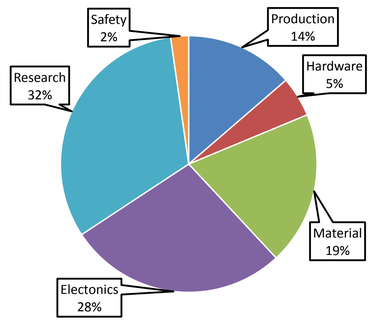
Specifications

Test	Specs	Results
Weight Test	<8 lbs	8.75 lbs
Load Test	250 lbs	250 lbs
Speed Test	10 mph	6 mph
Mile Range	2 miles	2.1 miles

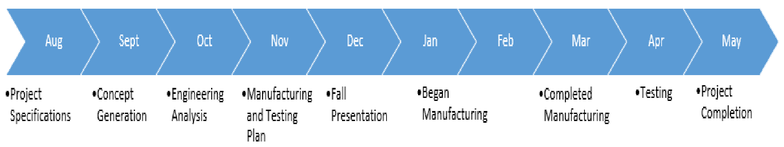
Power Requirement



Total Expenses

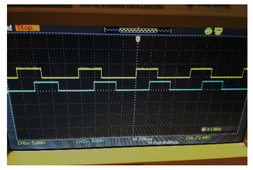


Project Timeline



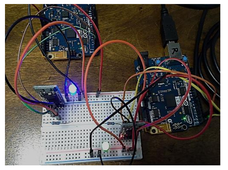
Testing

PWM (Both Skates)



- The pulse width modulation activates for both skates when the IR sensor and Tachometer are activated.
- The PWM controls the speed of the motors.

Bluetooth Linked



- Both Bluetooth modules where programmed using AT commands through both Arduino 101s.
- Once the modules are paired and linked the blue and green LEDs turn on

2 Mile Test

- Total distance: 2.1 miles
- Max speed: 8mph
- Avg. speed: 4mph

Safety Equipment

Shop Safety

- Safety Glasses
- No Loose Clothing
- Long Pants
- Thermal Gloves when Plastic Welding

Testing Safety

- Helmet (Complies with ASTM F1492-08 Standard)
- Elbow Pads
- Knee Pads
- Wrist Pads

Conclusion

- The skates were able to withstand the maximum 250 lb weight limit
- Each individual skate was approximately 0.7 lbs over the weight limit.
- The motor was successfully controlled by the different sensors.
- The mile range was achieved at a riding speed of 7mph.
- Improvements can be made for comfort and durability.

Sponsors: Brian LeBlanc

Adviser: Dr. Wanjun Wang