

E-Trike[®]

TiAuna Dodd Kasandra Price Felicia Long Terron Rose

Adaugo Anyamele Breyonna Pinkney Mercy Daniel-Aguebor

Technical Advisor: Timothy Brown



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Background : Why E-Trike?

- Clean energy transportation
- Affordable



- Conveniency of a vehicle and efficiency of a bicycle
- Eases stress for commuters, people of older age, people who have trouble balancing a bike
- Comfortability



E-TRIKE is a comprehensive solution for friendly transportation



Mobile app



Recumbent Tricycle



Electric Charging

Problem Definition



To successfully provide a source of friendly, reliable, clean energy and mainstream source of transportation

2017 - 2018 Academic Year Goals

- Replace Battery and Missing Parts
- Initial Development of IOS App
- Implementation schedule of IoT Technology with Bike

Long - Term Goal

- Complete Exterior Renovation for better reception
- Optimization of parts for cheaper price
- Further Integration of IoT Technology
- Compatibility with Public Charging Facilities

Target Audience



User: Youth

Functionality: IOS

App for Engagement



User: Disabled/Reduced Motor skills

Functionality: Recumbent Design



User: Energy and Pollution Conscious

Functionality: Electric Charging

Design Requirements



The entire trike should weigh between 80-100 pounds



The battery should weigh less than 10 pounds



Go less than 20mph



Compatibility with Public Chargers



Standards and Regulations

- The Consumer Safety Product Commission (CSPS)
 - Does not require a license or registration
 - \circ wheels at least 16 inches in diameter
 - a source of power no more than 20 mph.
 - Class 2 Bike
- Code of Federal Regulation
 - 16 CFR 1512 "FEDERAL HAZARDOUS SUBSTANCES ACT REGULATIONS REQUIREMENTS FOR BICYCLES"
- USPTO
 - \circ The E-trike must not infringe on the rear axle Tricycle Apparatus pattern

Current Status of the Art



- Price \$2,200
- Est. Max Range 15 miles
- Pedal Assist





- Price -\$80
- Est. Max Range -20miles
- Manual Pedals
- Price \$12, 985
- Est. Max Range 65 miles
- Capability for Solar Charging



- Price \$200
- Est. Max Range 15 miles
- Electric Assist

Current Solution Design - Fully Electric



Lead Acid Battery

Final Solution Design



Microcontroller Schematic



Implementation Process-Bluetooth and Lights



- Red For brakes
- White Left turn
- Yellow Right turn



Implementation Process - GPS



- GPS Pinpoints the current location of the E-Trike
- Integrated our app with Google Maps API

Implementation Process -ETRIKE



- Connected to mobile power source in series
- Supplying at least 40V power to the motor
- Attaching stable "L" brackets to give the wheel axle stability
- Hall sensors control throttle, brakes and battery usage indicator

Future Plans

- Add manual power
- Lithium battery
- Mobile App- make the Etrike profitable by enabling ride purchases



annlication with features that include GPS Smart Lights and "Find My Trike"- an F-trike locating

Conclusion

ORIGINAL GOALS

- Replace Battery and Missing Parts
- Initial Development of IOS App
- Implementation schedule of IoT Technology with Bike
- Compatibility with Public Charger

END OF SEMESTER ACHIEVEMENT

- Fully Functional Electric Tricycle
- Initial Development of IOS App
- Implementation schedule of IoT Technology with Bike
- Materials were inexpensive

QUESTIONS?

Thank you