

Undergraduate Level:

Researchers: Muiaser Arhara, Morley Garcia, Alexis Gonzalez, Araz Madenlian, Seonkwan Yoo

Presentation Title: Creation of Self-Charging E-Bike

Research Focus: Optimization of current individual and city forms of electric transportation.

School: California State Polytechnic University, Pomona

Students Level: Bachelors

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Abstract:

Creation of Self-Charging E-Bike

Muiaser Arhara, California State Polytechnic University, Pomona

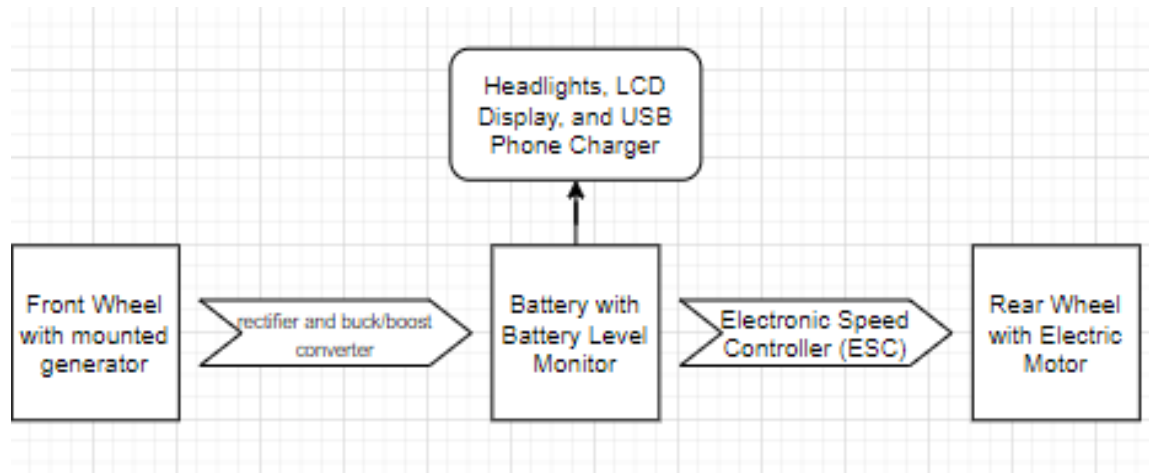
In today's day and age of incorporated technology of short distance forms of transportation such as electric bikes, scooters, longboards, and much more, we see that there is a need to optimize the current forms of electric transportation for both the individual and for cities that are integrating these technologies. This need stems from current transportation methods lacking methods to charge their batteries on the go, so the distances they can travel is very limited. Furthermore, once the batteries die on these transporters, it poses a challenge while out to find a convenient outlet with enough time to charge it.

In terms of cities that integrate this technology, having a dedicated charging dock to station as well as charge electric bikes seems to take up both unnecessary space and consume a large sum of city power. Additionally, electric scooters in cities need to be picked up by a company to be charged on a remote site, which makes locating a charged scooter inconvenient. Although these forms of integrated transportation have been very beneficial for many individuals worldwide, we feel optimizing this industry with a "Self-Charging Electric Bike" will pose a benefit to all of the issues outlined above.

In previous electric transportation technology, an electric motor is traditionally mounted on the rear wheel and is powered through a battery mounted on the frame. With our design, we propose a generator be mounted on the front bike wheel and the electricity it generates when the wheel moves from riding will be used to essentially charge the frame-mounted battery. This is a huge breakthrough to traditional methods because the bike can be easily charged on the go and not be limited to a distance it can travel, which makes it perfect for city-wide/commuter travel. Moreover, the bike will also be combined with essentials such as headlights, a compatible USB phone charger, LCD display, regenerative braking, outlet to charge the bike, and a basket to make it perfect for inter-city travelling.

This design will be non-invasive to the rider because none of the components that this bike will use will force the rider to position themselves differently to operate this bike. They will essentially use the Self-Charging Electric Bike like a normal bicycle.

The basic electronic schematic for the Self-Charging Electric Bike can be seen as:



We plan to design and create:

- The Generator
- The Rectifier
- Battery and Battery Level Monitor
- Electronic Speed Controller
- Headlights
- USB Phone Charger

The rest of the components that include the motor, LCD display, and wheels, we will buy and assemble onto the bike with the components we create.

To reiterate, with power being relatively incorporated within our lives as well as current means of electric transportation posing inconveniences on the rider, we believe it's time to optimize the industry of traditional limited electronic transportation by introducing a Self-Charging Electric Bike. The features included with this bike will combat the traditional and individual/city-wide problems that exist today and be a perfect and non-invasive transportation method for all.