



# Electric Bike Kit

ME 4371

Instructor: Dr. Turgut Batuhan Baturalp

Christian Nonol, Hector Hernandez, Jacob Hubner, Jinju Philip, Sadad Reza, Tariq Mohammed

## Overview:

The electric bike kit is intended to provide an efficient mode of transportation for 5-10 miles, which is a typical daily commute distance. The kit comprises a small battery, a brushless motor, and a controller with variable speed control. The main outcomes of the project indicate the successful application of design concepts to a real-world problem in sustainable transportation.

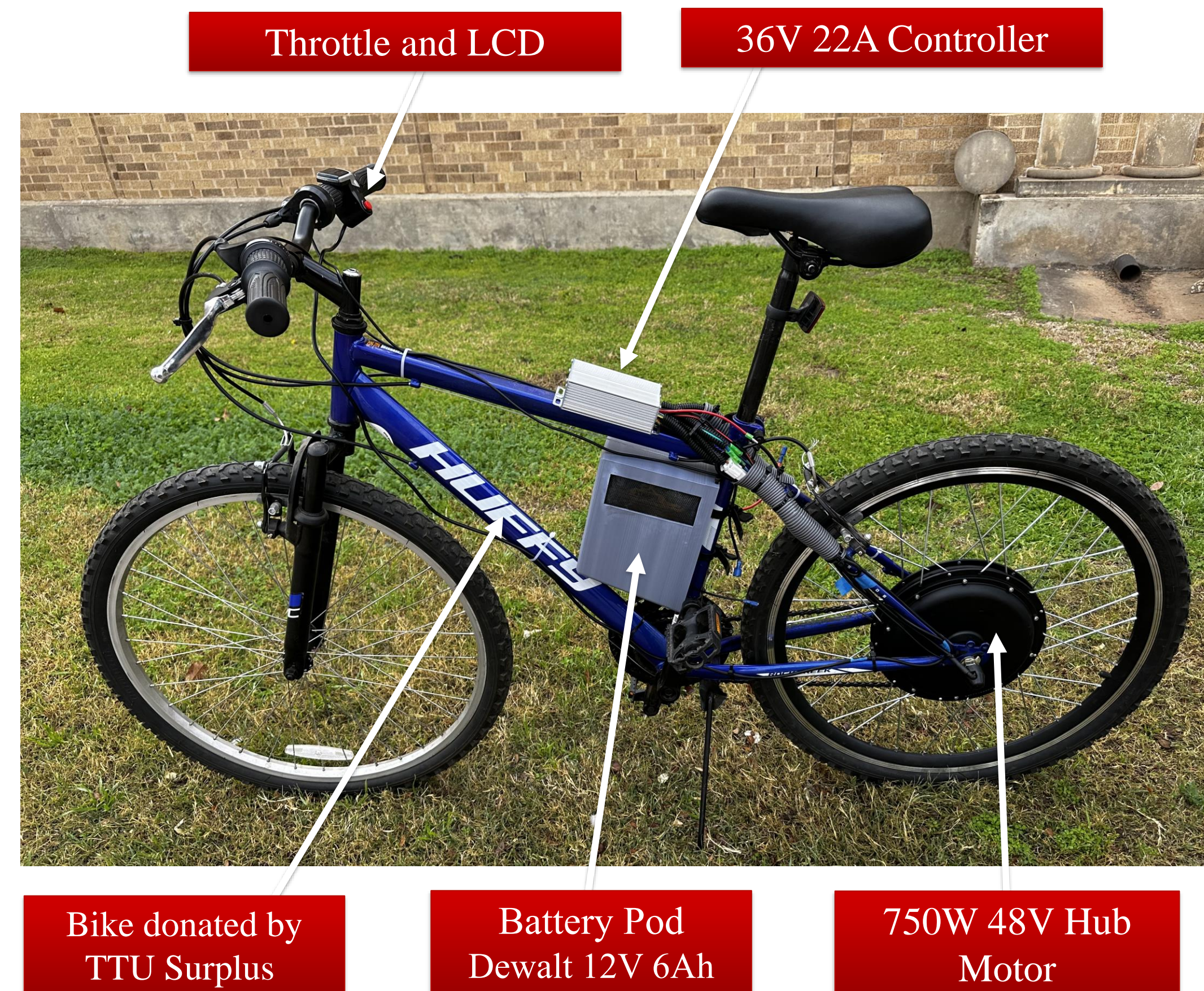


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## Problem Statement:

Electric bikes are expensive, making them less accessible for a large group of customers. They can also be hard to install, which can be a barrier for people who want to convert their existing bikes into electric bikes. Furthermore, some electric bike designs are bulky which makes it difficult for people to store or transport their bikes.

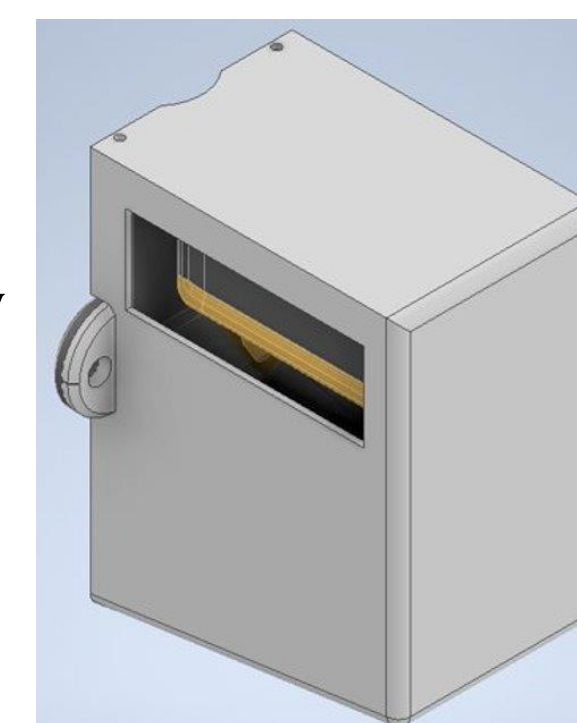
## Design:



## Manufacturing:



The battery pod was designed using Autodesk Inventor and fabricated via 3D printing. Comprised of two batteries, battery adapters, and interlocking components, it boasts security features with a locking mechanism while also being conveniently portable.



## Calculations:

### Capacity:

$$36V \times 6Ah = 216 Wh$$

### Range:

$$\frac{216 Wh}{15 \frac{Wh}{mi}} = 14.4 miles$$

- Assuming the power consumption is 15 watt-hours per mile. Using pedaling in combination with 50% throttle.

### Maximal unloaded speed (only using throttle):

$$400 RPM \times 60 \times 0.001289 mi = 30.936 mph$$

### Approximate loaded speed:

$$30.936 mph \times 0.7 = 21.6552 mph$$

## Results:

Total Price	\$370.36
Total Range	~ 13miles
Top Speed	20mph
Assembly Time	1 hour
Charge Time	3 hours