PSU eSportbike

Overview
The PSU LTI eSportbike capstone team is tasked with installing a battery system into a BMW S1000RR motorcycle to allow the bike to run on electricity as opposed to gasoline. In order to perform this conversion, the team must design and manufacture boxes that will be mounted to the bike in order to store the batteries. The team must also determine an effective method for arranging the batteries in the boxes as well as connecting all of the batteries to each other and the motorcycle.

Objectives
The objectives for the project were to finalize the aluminum battery boxes in SolidWorks, design mounting brackets for structural support, and design battery holders to secure the batteries in the boxes. After the design was finalized, parts and supplies needed to be ordered for the team to manufacture and install all necessary components for the BMW S1000RR and a final test needed to be performed to ensure that the motor operates when the bike’s throttle was engaged.

Approach
- Met with sponsor and obtained customer needs and an overview of the eSporbike project
- Generated physical concepts which were submitted to the sponsor for review
- Reviewed relative patents and concepts from competitors at other respective universities
- Performed an iterative processes for redesigning CAD models for the electric motorcycle
- Performed FEA on the final CAD models to ensure their structural integrity
- Analyzation performed on the amount of deflection observed through FEA
- Water-jetted Teflon and aluminium components to be assembled

Outcomes
- The Penn State eSportbike Team will have a crucial system finalized for their upcoming eSportBike competition between various universities.
- The team’s sponsor saved money through manufacturing parts with a waterjet as opposed to a CNC mill