Optimum Design of an Autonomous Ford Fusion

Overview
The Penn State and Ford teams defined the project scope to design the interior of an individually-owned, fully electric Ford Fusion with SAE level 4 autonomy that will be on the road at a time when most other vehicles have the same level of autonomy.

Objectives
The team’s objectives were to design the interior of a fully autonomous Ford Fusion with a focus on seat configurability. The team’s goal was to design a 3D model of the vehicle using SolidWorks and present the model using virtual reality software.

Approach
- The team created a customer survey to find out exactly what customers were interested in in the design of an autonomous vehicle.
- The team performed research on relevant patents and other conceptual designs.
- The team used its research to generate concepts for its design which were ranked using weights calculated from an AHP table based on the customer needs survey.
- The team began system-level design to allow for seat configurability.
- The team visited Ford’s Product Development Center to present its findings and gain valuable insight on how to improve its design.
- The team began detail design by designing the seats within the vehicle.
- The team created multiple prototypes using CAD software.
- The team took measurements of different dimensions to ensure that they met metrics that measure comfort and other major needs.

Outcomes
- The team’s final CAD design is a fully-autonomous Ford Fusion with a functioning seat configurability system.
- The sponsor was very satisfied with the model created by the team which will be used as inspiration for further research and design into seat configurability systems in autonomous vehicles.