Project Proposal for Capstone Systems Design for ECSE (ENGR 4940U & 4941U)

2022-23

The capstone design courses represent a culminating major team work design experience for engineering students in the electrical engineering and software engineering programs. The capstone is meant to allow senior-level students in teams of 3 – 4 students to integrate their engineering knowledge and produce useful engineering artifacts. The projects are meant to be customer-driven and are proposed by industry, community organizations, or faculty members. Each team is supervised by a faculty member providing technical expertise. The projects must be (1) *open-ended* where students can exercise choice in design and implementation strategies, and (2) *feasible* so they can be completed by 3-4 students over two-semesters.

Project title: A Smart Licence Plate and EV integration with Smart Grid

Faculty advisor: Tarlochan Sidhu

Background information: Describe the domain and context for the project.

Currently used licence plates for vehicles are metal type plates with numbers and some stickers without any smart features. This design has not changed for many years and has been prone to many issues such as, peeling and theft. With the advancements in display technology, communication technology and automotive technology including EVs, it is now possible to replace the old metal licence plates with digital plates with many smart features such as integration with smart grid, theft detection, expired plates, reminders for registration etc.

Objectives: Briefly describe the problem you want the students to solve and any special constraints.

The objectives of this project are:

- Identify the issues with current metal licence plates and determine how these can be addressed using a smart digital licence plate
- Identify other smart features of the proposed digital licence plate including features that help with integration of EVs with the smart grid including V2V, V2G etc.
- Design and develop a smart digital licence plate with the above-mentioned features
- Test and demonstrate the features of the smart digital licence plate

Expected Deliverables: What do you want to see at the Capstone Expo in April to call it a successful project.

A prototype of the smart digital licence plate

Number of students needed for this project: 5

Students area of study: SOFE, ELEE, mixed – 3 ELEE, 2 SOFE

Is this an industry sponsored project? (Y/N): N

If yes, what is the name of the industrial sponsor.