SMARTSEAT Smart Baby Seat

Overview
Year after year, there are many child deaths related to parents forgetting their children in the car. SMARTSEAT wants to develop a baby seat that reminds the driver to remove his/her child from the vehicle. We created modules that can be inserted into a baby seat and the driver’s door that automatically reminds the parent to retrieve the child when they arrive at their destination.

Objectives
Our main objective was to create a system that is able to sense that a child is in its seat, and able to determine if the driver arrived at his/her destination. If the driver has opened the door and the baby is in the seat, a reminder is triggered. We used a weight sensor to determine if a child is in the seat, and a ping sensor to determine if the driver has opened the door.

Approach
- Started with project definition, and a review of requirements to achieve desired functionality.
- Negotiated with sponsor after the main goal was understood. Evaluated time and material constraints.
- Researched various methods for weight sensing, and brainstormed methods to determine when a driver has arrived at his/her destination.
- Decided on a force sensitive resistor for weight sensing, and to monitor door open/close status to determine when the driver has arrived.
- Selected a microcontroller and wireless communication modules to process and send the information.
- Implemented audio amplifying circuit and speaker to provide reminders to the user.
- After testing on a prototyping board, we ordered PCBs to finalize the design.
- Tested and verified design with a real baby seat and car.

Outcomes
- The sponsor will save considerable time and money in prototyping phases.
- The sponsor will receive a unit that allows them to demonstrate their product to investors.
- The project provides a strong proof-of-concept design for continued work.
- The project resulted in many brainstormed ideas for future development and improvement.
- The sponsor will receive designs and information to continue work.