Overview
Lockheed Martin has challenged us with the task of creating an indoor navigation system of the design showcase which can be integrated with a pre-existing electronic scoring system. Our system is designed to assist judges with finding and scoring project tables by using Radio Frequency Identification (RFID) technology and an interactive map graphical user interface (GUI) that is a web-based application accessed by a Motorola Xoom tablet. The purpose of our project is to simplify and expedite the design showcase scoring process.

Objectives
Lockheed Martin required a system that is easy to use, easy to set up, and can be easily updated each semester. Our system needed to be integrated with the pre-existing electronic scoring system. Also, our system needed to display the location of a judge on the tablets interactive map GUI, update the judge’s location in a timely manner, and display the project tables that the judge needs to score. Our system needed to be accurate with minimal interference, function over a large indoor area, and meet our budget of $1000.

Approach
- Our team gathered our customer’s needs and requirements, and reviewed last year’s team design
- We visited our sponsor and gathered more insight on our project
- We researched solutions for indoor navigation such as GPS, WIFI routers, Bluetooth, and RFID
- After careful consideration of our customer’s needs we chose to implement RFID technology
- We created multiple block diagrams to analyse our system’s functionality
- Our team purchased an RFID scanner and tags from Serial IO, and we acquired Eclipse and the yCAD API to write our web-based java applet software
- We placed an RFID tag on each table and associated it with a specific table number on our map
- We fabricated a prototype of our indoor navigation system by creating a java applet that displays the interactive map DXF file
- We integrated our RFID hardware with our software, and integrated our system with the electronic scoring system
- We conducted performance testing

Outcomes
- We designed an inexpensive and scalable solution to simplify and expedite the design showcase scoring process
- We eliminated the need for binders and balloons, and now judges are able to score more projects in much less time
- We created a simple way to determine location indoors in a large venue