Lockheed Martin – Design Showcase Electronic Scoring System

Overview
Create a dynamic map of the design showcase that allows judges to efficiently navigate the design showcase.

Objectives
Lockheed Martin requested that the accuracy of the user’s location be correct to 1 square meter. They also wanted our dynamic map to integrate with their Electronic Scoring System that judges use to vote on the different projects.

Approach
- The team began the project by developing an appropriate list of customer needs that the team would attempt to fulfill for our sponsor, Lockheed Martin.
- Research was performed to determine the best method for finding indoor locations; we chose triangulation using Wi-Fi signal strengths.
- Trade studies were then carried out to find what hardware would be best to carry out triangulation.
- The team created various pseudo-code and flow diagrams to work through how our system would work.
- We created a native Android application to carry out the Wi-Fi triangulation pseudo-code.
- The team set up the system in several rooms in order to discover the accuracy of the location triangulation. We found that the larger the room the more precise of a location we were able to find.
- Information was collected regarding polling speed and varying Wi-Fi signal strength because they became limiting factors to how successful our accuracy was.

Outcomes
- They system found the user’s correct location in the Bryce Jordan Centre within 1.5 square meters.
- The sponsor now has a correct location finding algorithm they can pair with more advanced hardware for a more complete solution.
- The project showed limitations of consumer products to do indoor triangulation and now knows what characteristics they need from custom hardware.