

Geometric Visualization Tool

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PROBLEM

Our visualization tool addresses the current shortage of geometric algorithms libraries in Java. It leverages CGAL, an extensive C++ library renowned for its comprehensive collection of data structures and geometric algorithms. By integrating CGAL's robust capabilities with Java's strengths in visualizing geometric objects, our tool provides Java developers with a powerful resource for designing, implementing, and testing geometric algorithms. This integration not only enhances functionality but also improves accessibility for developers seeking advanced geometric computational solutions.

SYSTEM DESIGN

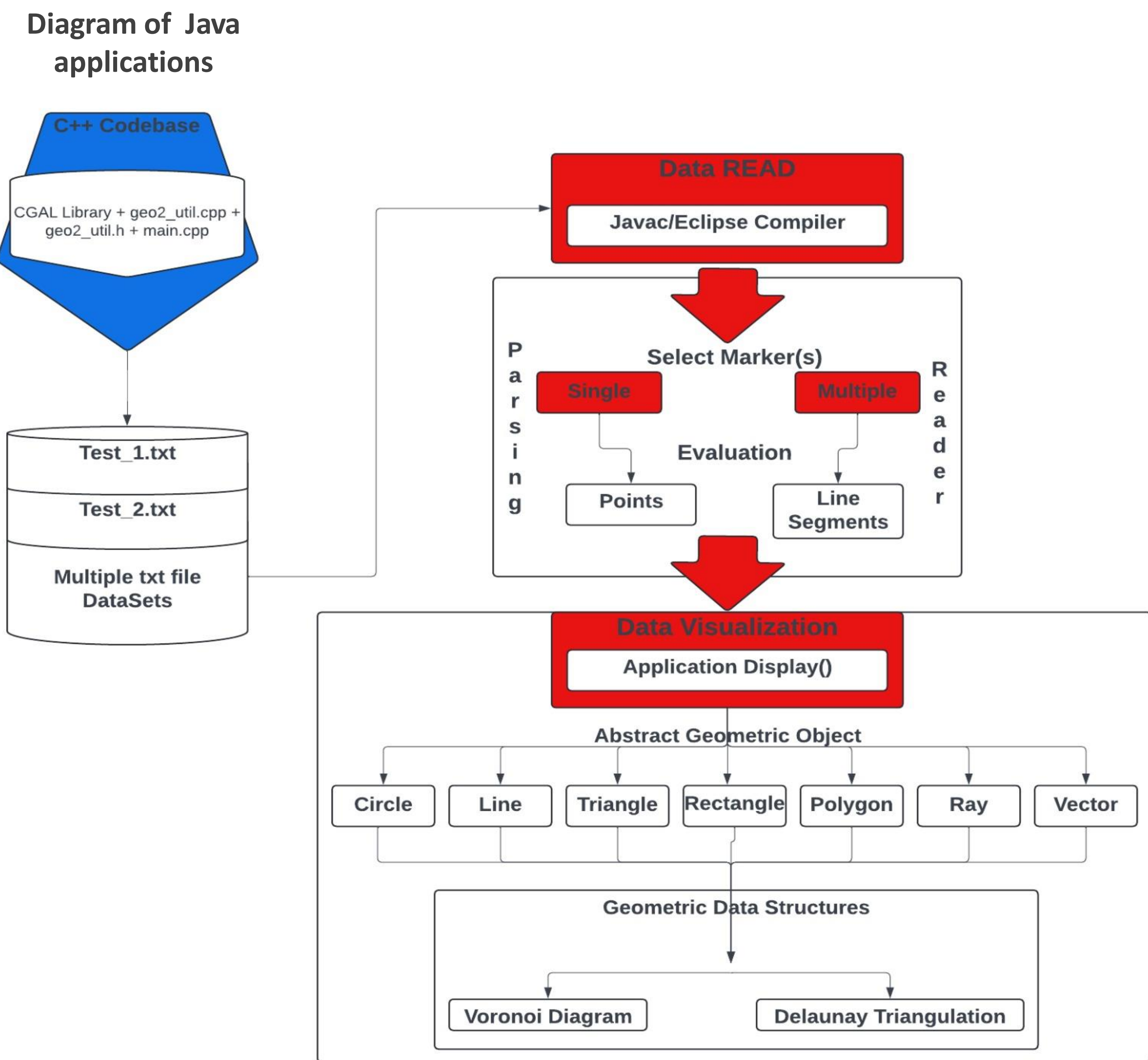
Our tool utilizes the Computational Geometry Algorithms Library (CGAL), a comprehensive C++ library dedicated to computational geometry. It supports a wide array of data structures and algorithms for creating and manipulating 2D objects. We leverage CGAL's capabilities to perform complex algorithmic operations on these objects. Once processed, the results are exported to a text file. Our Java-based application then parses this file, reconstructing the geometric objects for visualization. This framework simplifies the integration of graphical representations of geometric collections into Java programs, enhancing the ability to visualize the objects processed by CGAL.

IMPLEMENTATION

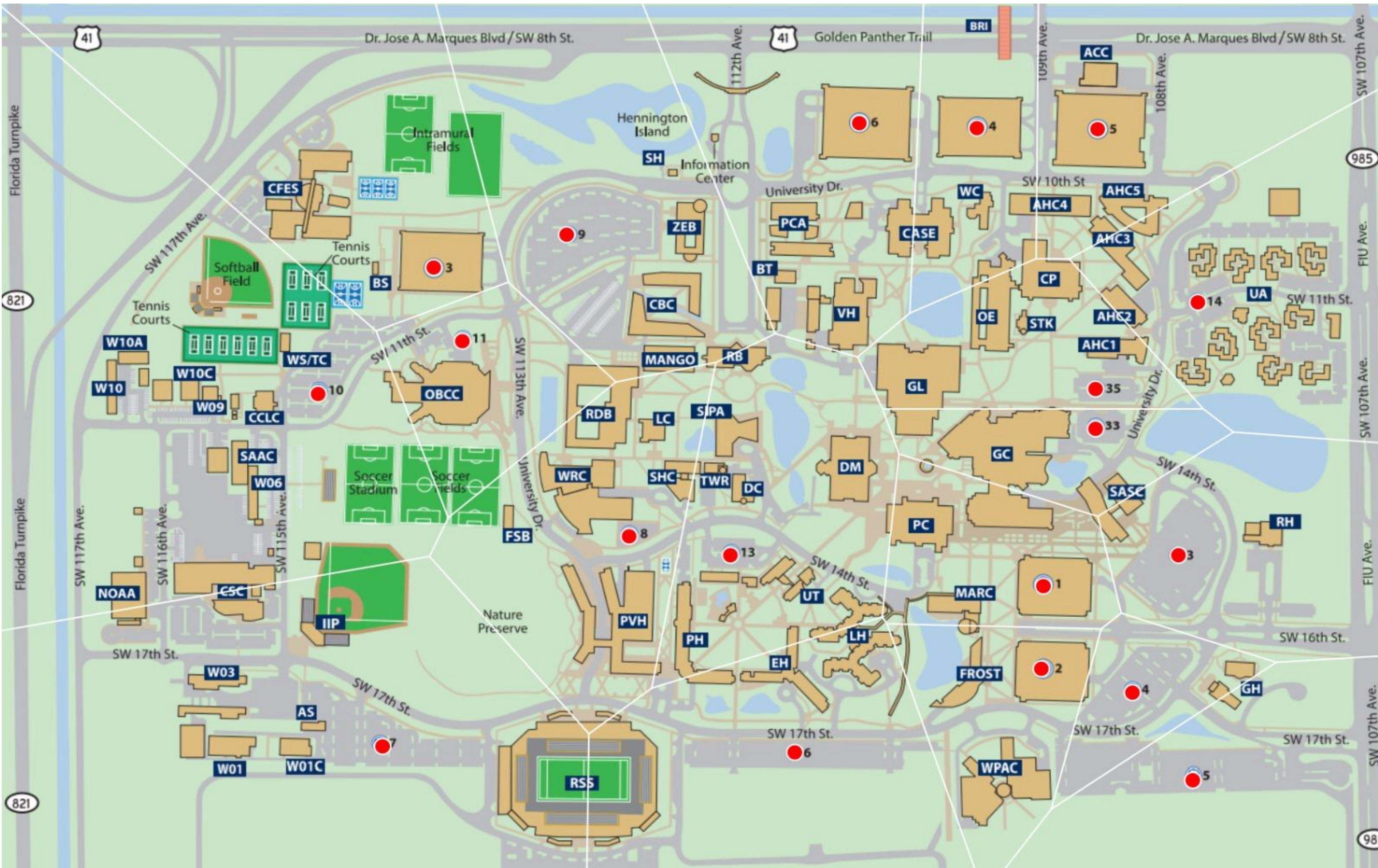
In this project I was responsible for developing the Java import component of our tool. This crucial section involved parsing files generated by the C++ segment, which contained the data of various geometric objects. I used my knowledge of Java's graphics capabilities to aid in the rendering these objects visually. This process required a detailed understanding of both the geometric objects used in CGAL and the graphical rendering techniques in Java.

REFERENCES

<https://www.cgal.org/index.html>
<https://docs.oracle.com/javase/8/docs/api/java/awt/Graphics.html>



Voronoi diagram of FIU
Parking spots



ACKNOWLEDGEMENT

The material presented in this poster is based upon the work supported by XXXXX (name of the project sponsor: federal, state or local government, or corporate partners, where applicable). We/I thank XXXX for his/her/their assistance and mentorship that I/we received throughout the senior design project.