The aim for my senior design project is to develop a mobile application that acts as a Smart Parking System, which will give users access to real-time information on parking spaces in crowded places like cities and colleges. The initiative looks to address the widespread problem of locating parking in crowded urban areas using real-time information that would be sent to devices for user convenience. From an academic standpoint, this project offers me the opportunity to combine theoretical knowledge and technical expertise from my undergraduate studies to use in solving a real-world issue that affects people all over the country. This project specifically will be utilizing my skills in application development and user interface design to achieve the overall goal.

My college experiences and classes have defined the approach to the project. Courses including CS4033: AI: Principles and Applications have provided me with a background knowledge of intelligent systems, which proves beneficial in researching and developing the system that would be implemented in various parking areas. The CS2028C: Data Structures and CS4071: Design and Analysis of Algorithms courses have allowed me to develop skills to design and develop efficient algorithms for real-time data processing. Backend related courses including CS4092: Database Design and Development and IT2060C: Database Management I have enhanced my abilities in managing datasets by utilizing databased programmed with SQL, which is essential for the project as we would need to store and update data continuously and in a safe manner. These courses, along with general programming and knowledge courses including CS1021C: Computer Science I and IT3045C: Contemporary Programming, have prepared me to understand and handle various complexities and issues that may arise in software and mobile development. In addition, the CS5167: User Interface I course will improve my ability to develop effective and user-friendly interfaces, which is also critical to the project for when we perform front-end development with the mobile application.

My co-op experience has enhanced my skill set with understanding of real-world applications of application development as well as processes of research and development with context of investigating hardware. At ATech Training, as an Embedded Engineer Software Co-op, I developed an Android application that focused on workplace efficiency using Kotlin and various diagnostic software tools using C# and the .NET framework. This experience taught me the importance of writing clean, maintainable code and performing thorough quality testing. Additionally, through my co-op, I was able to gain experience in the initial research of microcontrollers and displays. The ability to explore hardware while on co-op taught me the ability to perform effective research and analysis for when, for this project, we determine the best real-time hardware to integrate into our mobile application.

I am motivated to engage in the project as it aligns with my passion for application development. The opportunity to develop a Smart Parking System allows me to explore my interests in mobile application development and user experience design and apply it on a real-world scale. Additionally, being able to explore and address a common, persistent issue that has personally affected me numerous times fuels my motivation to develop this project. My preliminary approach involves conducting thorough research on existing solutions and markets, gathering user requirements through interviews originating from all perspectives, and iteratively developing and testing the mobile application side of the project. I plan to implement and ensure continuous improvement and adaptability throughout the project.

I anticipate this project to result in a working Smart Parking System on a small scale that demonstrates the ability to enhance the parking experience for drivers. My accomplishments will include developing a robust system to communicate between the user and the parking systems, creating an intuitive user interface through a mobile application, and ensuring seamless integration with real-time data sources and all components of the parking system. To self-evaluate my contributions, I will set specific milestones and performance metrics, such as user feedback and system performance benchmarks. I will know that the project is successful when the application meets the defined requirements, receives positive user feedback, and demonstrates measurable improvements in parking efficiency and high accuracy in providing data real-time.