Senior Project Proposal

1. Project Name: School Bus Tracking
2. Contact Information:

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1. Abstract

The purpose of this project is to provide additional safety to students as well as peace of mind to parents. There are currently no safety measures on school busses in regards to who is on the school bus at any given time, in case of a car accident, or if a student has even gotten on the correct bus to get home. This application will track students as they attempt to board and leave the bus.

1. Background & Prior Knowledge

I have a certain amount of knowledge of riding school busses as well as transit busses throughout my life, but a lot of the ideas for this project came from my mother. She has been driving school busses off and on for over 30 years in many different states and school districts and these are observations that she has made from her experience.

As far as prior knowledge, this application will utilize a backend database, of which I am very familiar with SQL. I have created ERD’s which I have turned into database structures for classes in the past.

For the front-end application, I am unsure exactly how I will implement this. I could go with a mobile app format with which I have 0 experience developing an app. Or I could go with developing a website which I have some experience but would still consider myself a beginner at.

1. Description
   * Why?

The main reason I think this should exist is children safety. An example my mother gave me was a time when a school bus was in a car accident. The bus was hit and flipped on its side. Thankfully nobody was seriously injured but the school district had no idea which kids were on the bus and as a result of that, they didn’t know which parents they needed to contact. They also had no knowledge of potential special needs or previous ailments of the students in the accident. Another reason is that sometimes kids can get on the wrong bus, especially near the beginning of the school year. Having a system like this that can alert the bus driver that a kid is potentially on the wrong bus could be very helpful in these types of situations.

* + What? – This application will essentially be a database that contains simple information on the students. Their route number, their parents contact information, and their name. That database is then attached to some kind of front-end UI that allows for easy bus driver or student use.
  + Who? - This application is aimed toward school districts and school busses.
  + Where? – I will develop this at home on my own computer and its implementation will be either on the mobile devices of the bus drivers or a tablet attached to the bus.
  + How? – In a perfect world, this system would use AI and facial recognition to log kids on and off the bus. In a realistic world it would probably use some type of keycard system that kids would attach to their backpack to log in and off the bus. For my implementation I will use either an App based system that will allow kids to scan a QR code given to them by the bus driver to log into and out of the bus. Or a website that will allow the bus driver to manually log in the students by name into and out of the system.
  + When? – the application will be considered done, once it can reliable log students into and out of the system. Afterwards it will just be cosmetic improvements to improve the ease of front-end interaction.

1. Significance

I think that is project could be a great help in schooling systems across the United States. Being able to confidently contact parents in case of a worse case situation, or to make sure the first few weeks of school go smoothly with no lost children getting on wrong busses could be a big help to schooling districts.

I also think that this would be a great addition to my resume. Being able to identify a real-life problem and show that I developed a solution for it would signal to future employees that I’m capable at recognizing and solving real life problems.

1. New Computer Science Concepts

There are quite a few things for me to learn throughout this project. Although I know the basics of SQL and database setup, It will be a new experience creating the requirements for myself and executing them. As well as connecting that database to the front-end UI will be a completely new experience for me.

Depending on which type of front end UI I go with I’ll be forced to learned and expand my knowledge for both. In the first case, I know absolutely nothing about app development so it would require a lot of research and learning. Things like which IDE and language to use, to differences between Apple and Android development.

The other front-end UI would require me to learn a lot about HTML and CSS or potentially even Java/JavaScript. I’ve done some work in previous classes learning about the basics of JavaScript, and HTML + CSS website development but I would consider myself a novice in both areas, and creating a good-looking website + connecting it to my backend database will require me to learn a lot.

1. Interestingness

I think that this project can solve a real life problem and it gives me ample opportunity to grow as a developer. I think that it will look really good on my resume and the fact that it is in an area that impacts someone who is close to me makes the project more interesting.

1. Tasks and Schedule

Week 3: Research and UI finalization (Pick which end user UI I want to choose). 10 Hours

Week 4: Research chosen UI requirements and setup. 15 Hours

Week 5: Create simplified SDD with high level Structure/ERD’s/DFD’s/Flow charts. 15 Hours

Week 6: Initial implementation and beginning coding. 10 Hours

Week 7: Create test cases and finish initial implementation. 15 Hours

Week 8: Test pass with more thorough implementation. 15 Hours

Week 9: UI and backend code complete. 15 Hours

Week 10: UI and backend code polish. 10 Hours

Week 11: UI graphics update and formatting. 10 Hours

Week 12: Final graphic polish + final submission prep. 5 Hours

Week 13: Instructor meeting prep + presentation. 5 Hours

TOTAL HOURS: 125 Hours

1. Resources

I will be using Github as my version control software, and If I choose the web application Visual Studio Code as my IDE and will need to find some type of web-hosting service to host it on. For the mobile app option, I will need to install a new IDE and potentially other languages/software to develop the apps on.