Get Home Safe

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INTRODUCTION

Our project's inception aimed to meet the need for Trinity College students to locate the campus shuttle bus. Historically, students have underutilized this campus resource because the Trinity College website only lists the shuttles stop points and had no fixed time schedule. Subsequently, students often opt to walk instead of waiting for the shuttle. The reality of the student body's relationship with the campus shuttle not only wastes Trinity College funds, but also cheated students of a reliable mode of transportation across campus when it counts. To remedy this issue, Get Home Safe is a proof-of-concept iOS application for Trinity students that tracks the campus shuttle and displays the real time location in relation to the user. To further advance the functionality of Get Home Safe, the app also includes a screen that pinpoints the location of Trinity's Blue Light Systems so that, should a student choose to walk across campus, they will be able to choose the safest path from point A to point B. To achieve this goal, the project consists of back-end hardware and software in addition to a localized database and server to efficiently communicate data to the simple front end user interface.

FRONT END

The user facing application was completed in the Spring semester

1 Shuttle Tracker

The main functionality of our front end application is the shuttle tracking capability. In order to produce a simple and powerful user application, we used the Swift programming language and Xcode IDE to connect our back end to the users. Within Xcode, we utilized the MapKit API in order to display the location of the shuttle bus along with the user's current location. This way, any student can track the shuttle bus in real time and determine the bus's proximity to their location.
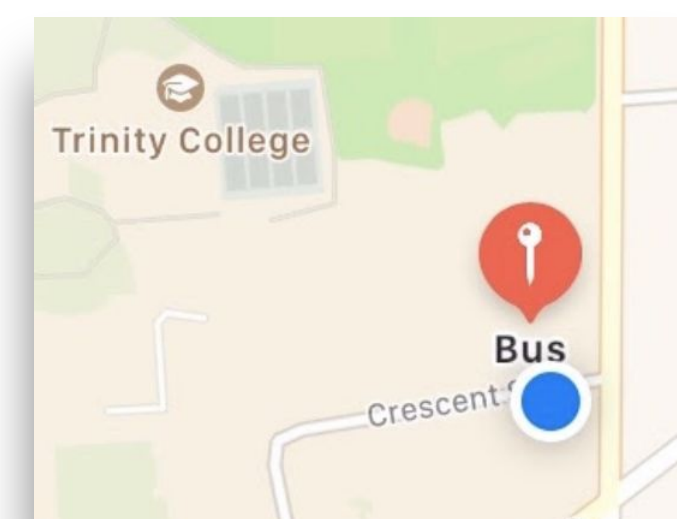
2 Blue Light Map

Our front end also features the Blue Light Map that displays a pin for each blue light phone pole on campus. We determined the exact coordinates of each pole by physically walking around campus and we found a total of 37 blue lights that we hard code into the Get Home Safe app. The user can easily find the Blue Light Map by choosing the corresponding tab in the application. The Blue Light Map also displays the user's location so that they can find their way to the nearest blue light pole.

BACK END

The back end functionality was completed in the Fall semester

1 Hardware

In order to receive the longitude and latitude coordinates of the campus shuttle, we needed a piece of hardware to act as a beacon. Our lack of an engineering background created the need to research a piece of hardware that could communicate with iOS applications. An iPhone proved to be an ideal back end beacon as it already has its own internal CoreLocation API. We created a simple iOS application for the beacon iPhone that sends the beacon's location to our server coordinates after it is downloaded

Kyle's Phone Location

7:38:54 PM

[{"user":"Kyle Long","lat":"37.3343","lon":"-122.079","time":"1620065143"}]

2 Software

To utilize the iPhone's CoreLocation API, we developed a back end app that was able to call on this data and appropriately transmit it. We used Xcode to create a simple app that was downloaded to the beacon iPhone. To further the functionality of this application we also found creative ways to bypass the iPhone's privacy settings so that our software could continue to direct the phone in transmission regardless of if the phone was locked or not.

Beacon iPhone → **SQL server** → **Apache server** → **GET HOME SAFE Front End Application**
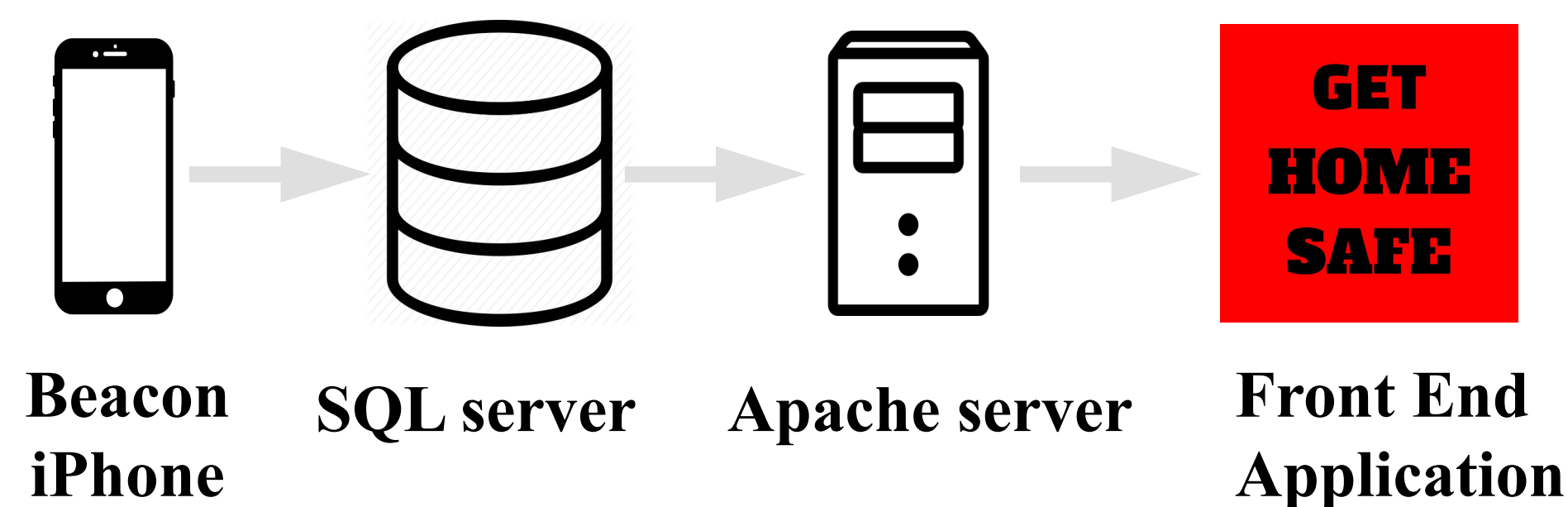
3 Server

Our main server runs on Apache Server Software and is connected to a MySQL server database that stores the latitude and longitude data from the beacon iPhone. The coordinates are then retrieved from the database and parsed by the Apache server in JSON format. The Apache server is written in PHP and HTML. The Get Home Safe app connects to the server and reads coordinate updates in real time. These coordinates are then used to update the bus marker so that users can watch the bus icon move as the bus moves.
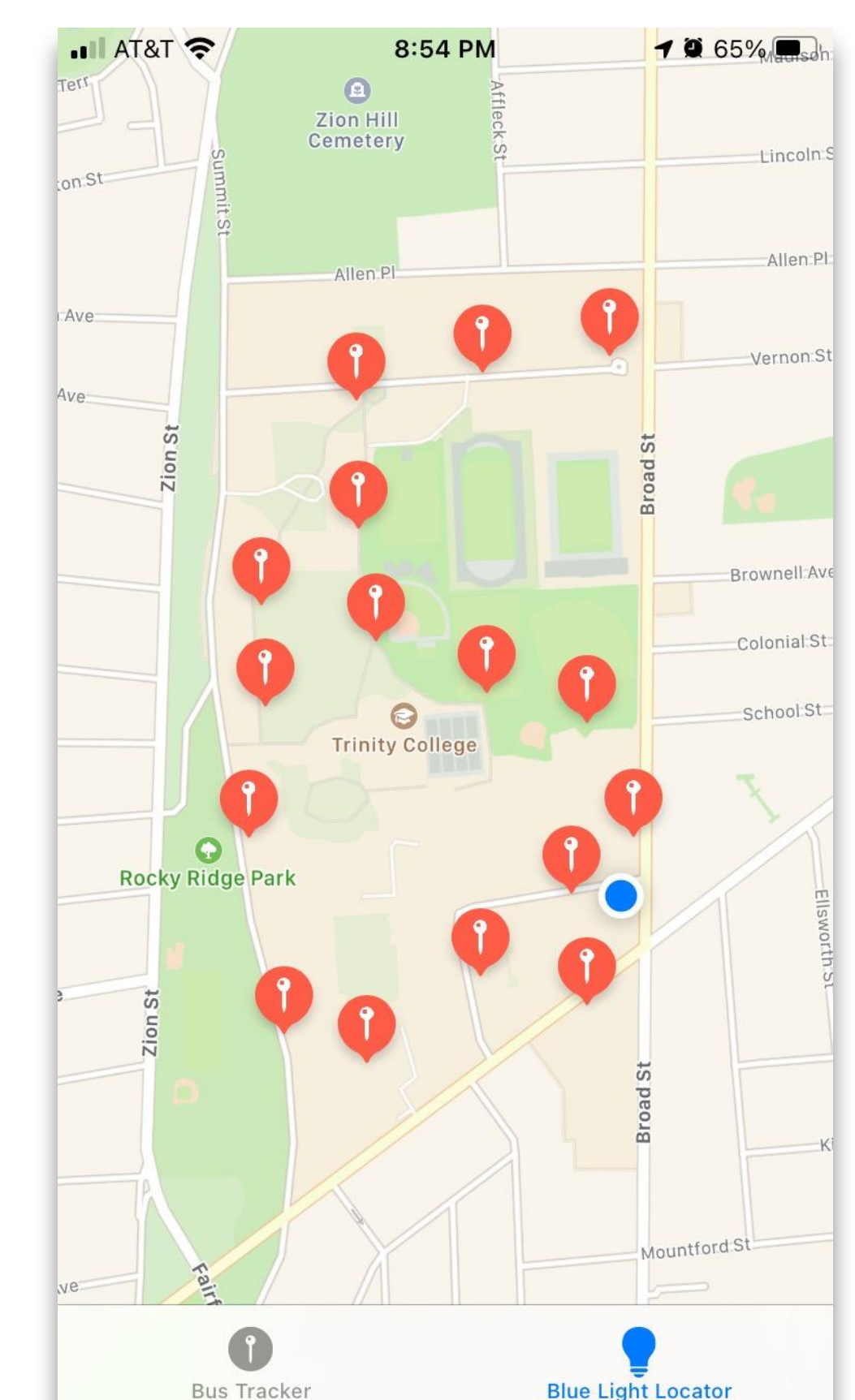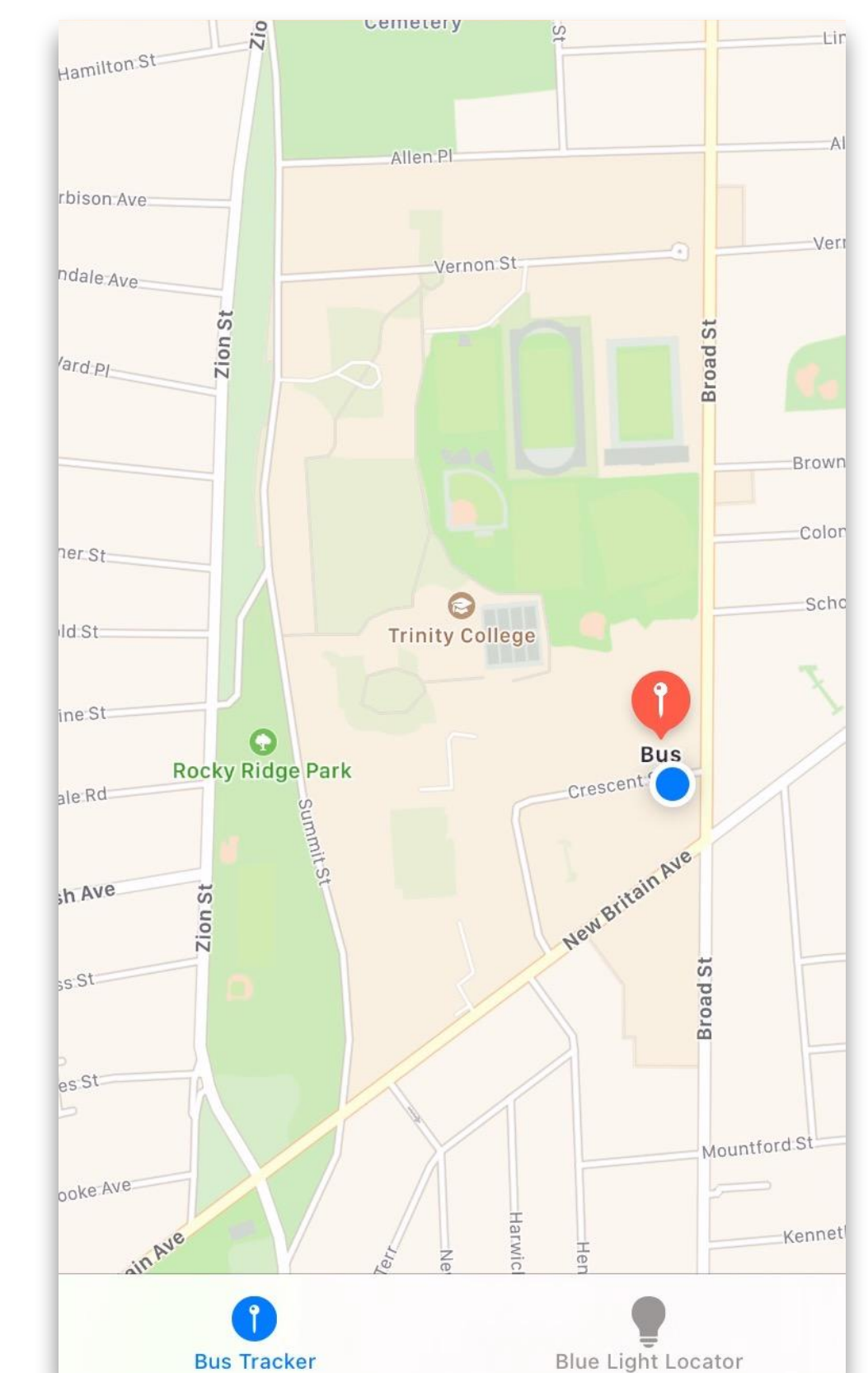
CONCLUSION

1 What We Learned

- Swift and PHP programming languages
- Team development
- Server setup and networking
- UI and UX design
- Utilizing online resources for individual learning

2 Future Features

- Shuttle bus ETA calculator
- Emergency campus safety call button
- Launch to Apple app store
- Expand to Android

Acknowledgments