SWE -SCAVENGER

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ABSTRACT

Scavenger is a map based social application that allows users to drop images and messages for anybody and everybody to see at their current location, so that people that arrive within a certain radius of this spot can view everything left by others.

GOALS

- Create a fun application that utilizes wireless technologies
- Interact with the 802.11n WLAN through TCP/IP
- Understand how to use geolocation and mapping
- Realize real world implementations and usage of wireless frameworks
- Utilize wireless frameworks to work with different types of databases and servers
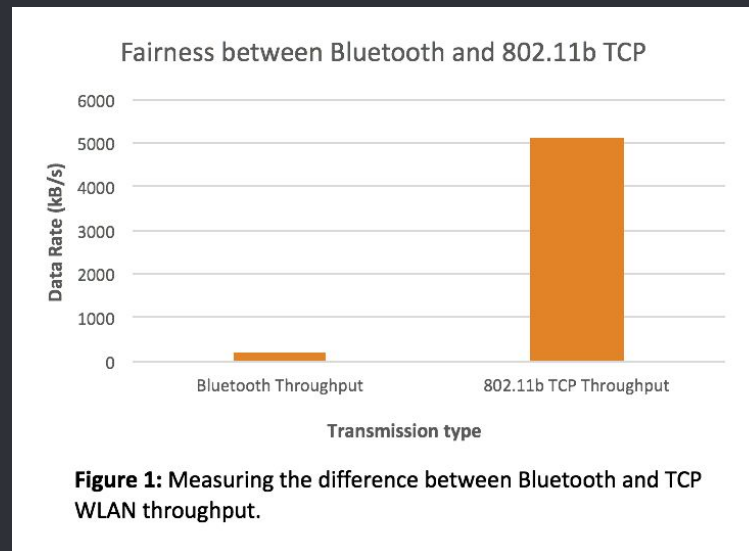
Pre Application

The various data we looked at to decide on how to implement the project goals.

LAB RESULTS

When deciding on what wireless technology to use, we first looked at WLAN against Bluetooth.

Fairness between Bluetooth and 802.11b TCP

Figure 1: Measuring the difference between Bluetooth and TCP WLAN throughput.
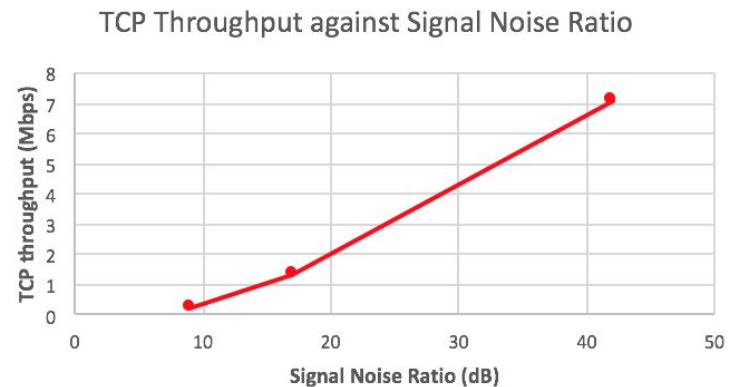
Bluetooth was a lot less fair and did not work well for the coverage range (in miles) we were looking for, so the obvious choice was to rely on WiFi.

LAB RESULTS

We looked at some Lab Results from early on to decide which WLAN protocol to use.
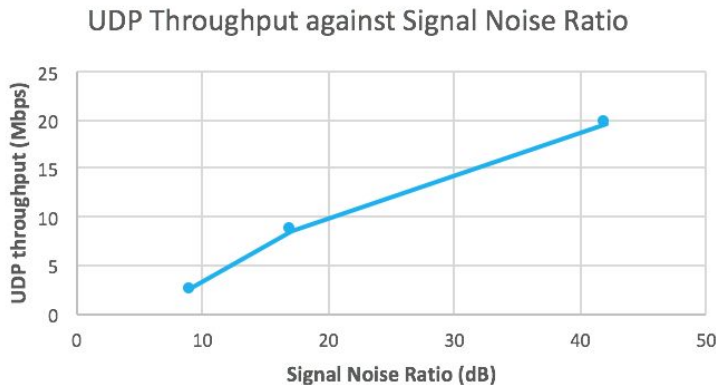
Figure 2: Graph representing how the data rate of UDP varies with increase SNR.

Figure 3: Graph representing how the data rate of TCP varies with increase in SNR.

We noticed that TCP was for the most part a lot more robust. 802.11n by default runs on this and so we chose to stick with this platform.

Application Architecture

After deciding the protocols, we had to decide on which platform to build on and what services to use

Apple and Google's Map Services

No-SQL Database

Firebase

Scavenger

Log In

Register Now

Forgot Password?

Or Sign in With
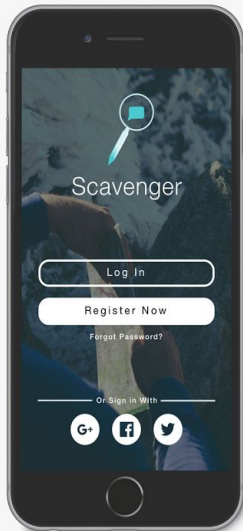
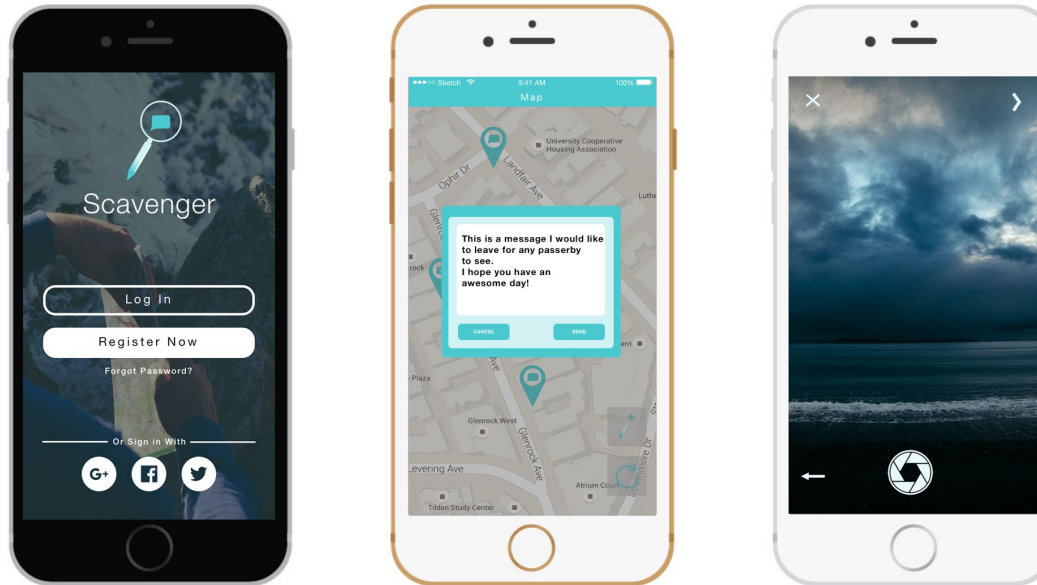**Local Application**

facebook

Facebook Authentication

DESIGN AND APP

We started by creating a quick mockup of the application and then went about creating the UI

INITIAL MOCKUPS

The idea was to provide the user with a simple interface. Login, the map with all the different drops and a camera for taking pictures to drop. They could also have the option to leave a message anytime they wanted at their location.

The initial design had the ability to log in/register with our own service and use many different profiles. However we decided to stick directly to Facebook for the course to create a minimally viable product.

ACTUAL DESIGN
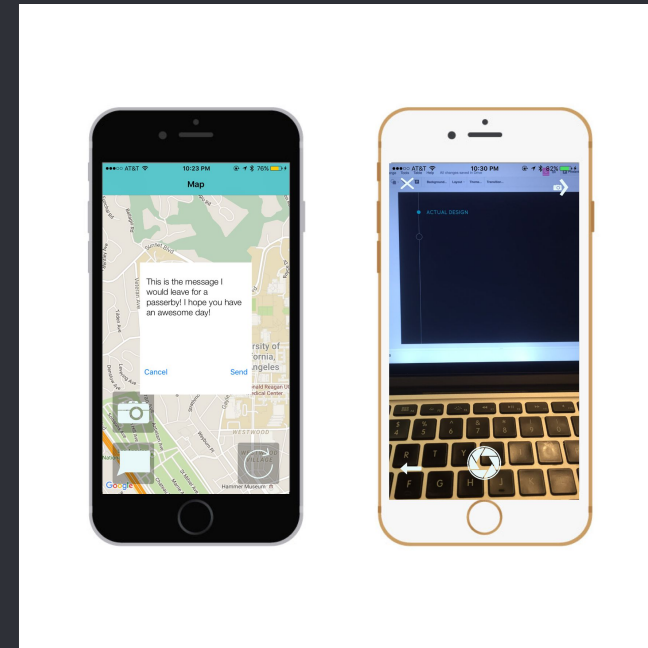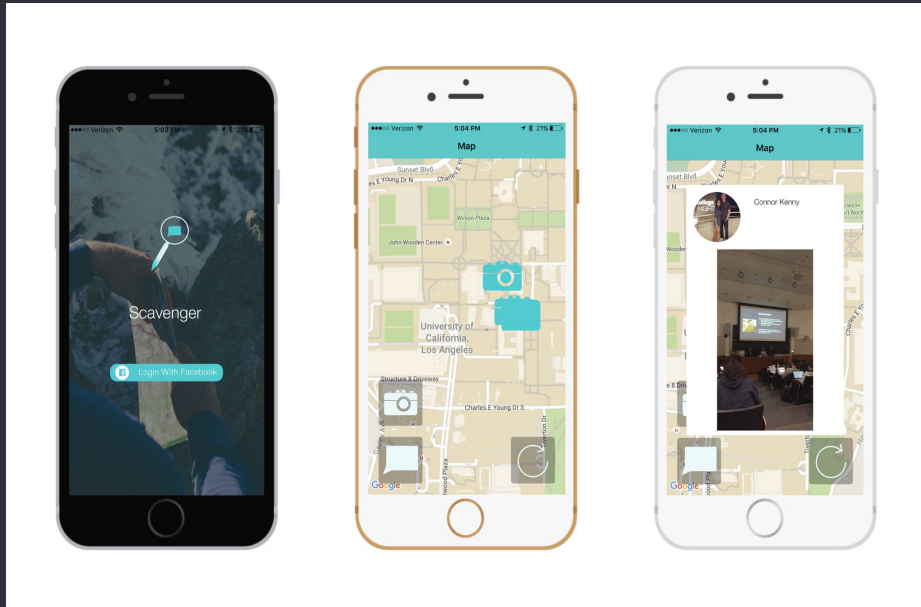
The design seemed to coincide with the initial mockups and of course, given more time this design would be more polished.

The functionality of the application however, works exactly how it was envisioned and follows the architecture presented earlier.

Communication with location services, Facebook and real time Firebase is seamlessly integrated.

Facebook

Using Facebook's Swift SDK, the authentication and login of the user was taken care of by using TCP/IP on the network layer and HTTP RESFTful services, and allowed us to store simple user data such as name and profile picture.

Google Maps/ Core Location

Google Maps provided some difficulty in importing due to its large size and thus incompatibility with regular Github for collaboration.

The GPS gave relatively accurate data regardless of being on 802.11 WLAN and/or 4G/LTE cellular.

Firebase

This is a No-SQL real time database that was used for the data storage for persistency and for remote access.

Using the provided SDK and Swift parsing, we wrapped the data up in JSON and sent it and received the information as JSON too.
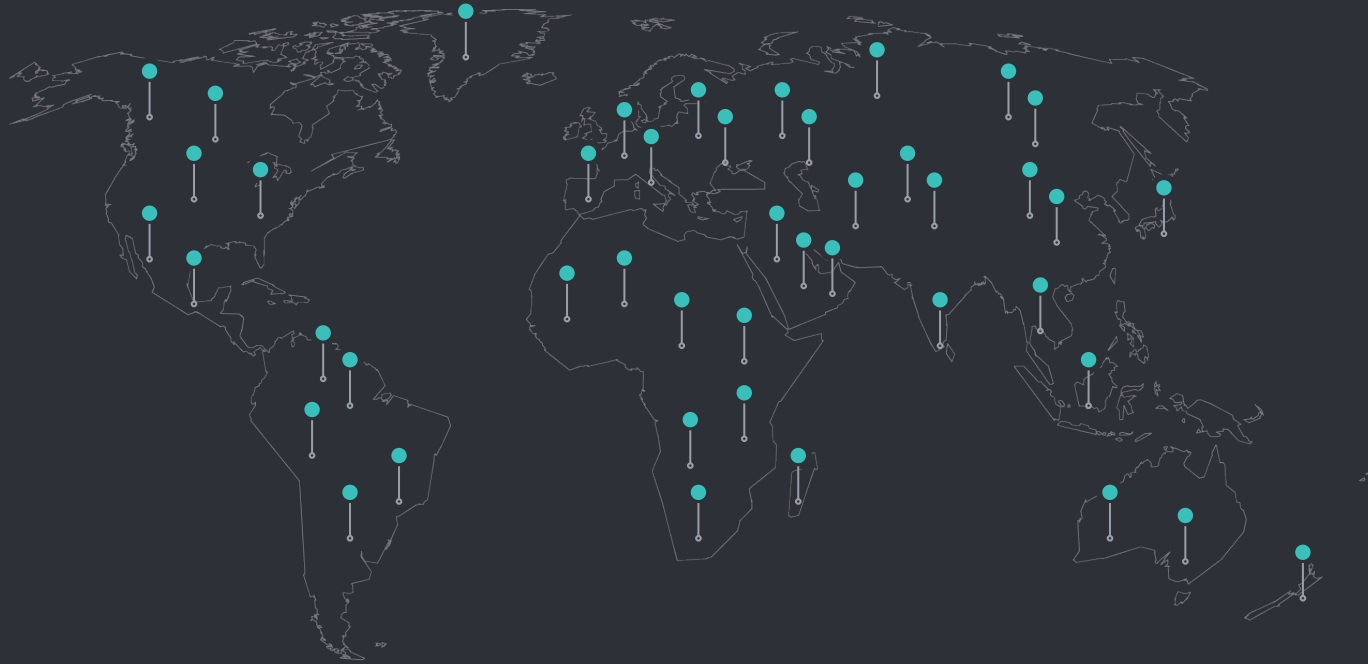
Results

Using the application ourselves over campus, we demonstrated some interesting and exciting results

RESULTS

- Built entirely in Swift for the iOS, Scavenger ended up being a very user friendly application.

- The lack of any networking issues proves that the current TCP/IP Model is quite robust and stable.

- We didn't lose any data through transfer - shown by quality of images sent and received.

- The range of the application spans miles.

- Though the underlying layer of networking is complex, the real world usage of the API's make using the application layer communication with physical layer intrinsically beautiful

THE FUTURE

The application was built with the intention that it could be used around the world, to truly change the way you interact with a place and a person. The future holds for UI improvements, more features and an Android version.

Thanks!

ANY QUESTIONS?