MICHIGAN STATE UNIVERSITY

Project Plan

Shared Parking Access

The Capstone Experience

Team Bedrock Detroit

Eric Podolsky
Jude Jang
Michelle Mao
Ritu Ahluwalia
Will Lennon

Department of Computer Science and Engineering
Michigan State University

Fall 2020

From Students…
…to Professionals

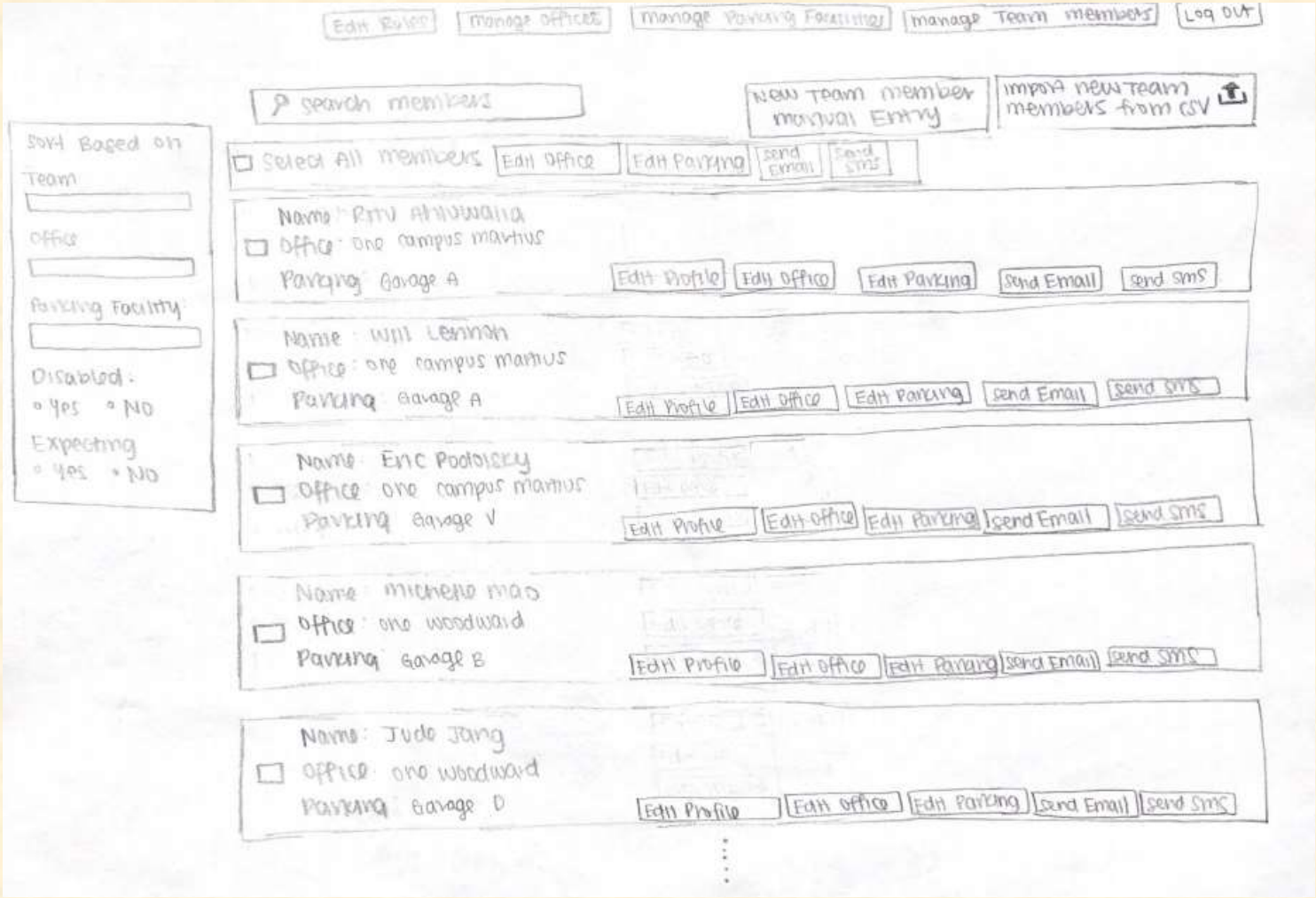
Functional Specifications

- Create an application that will determine where everyone will park
- Not everyone will come into work every day, parking spaces can be shared
- The application will allow more users to park closer to their office buildings
- The application will be able to dynamically change based on other factors determined by leadership

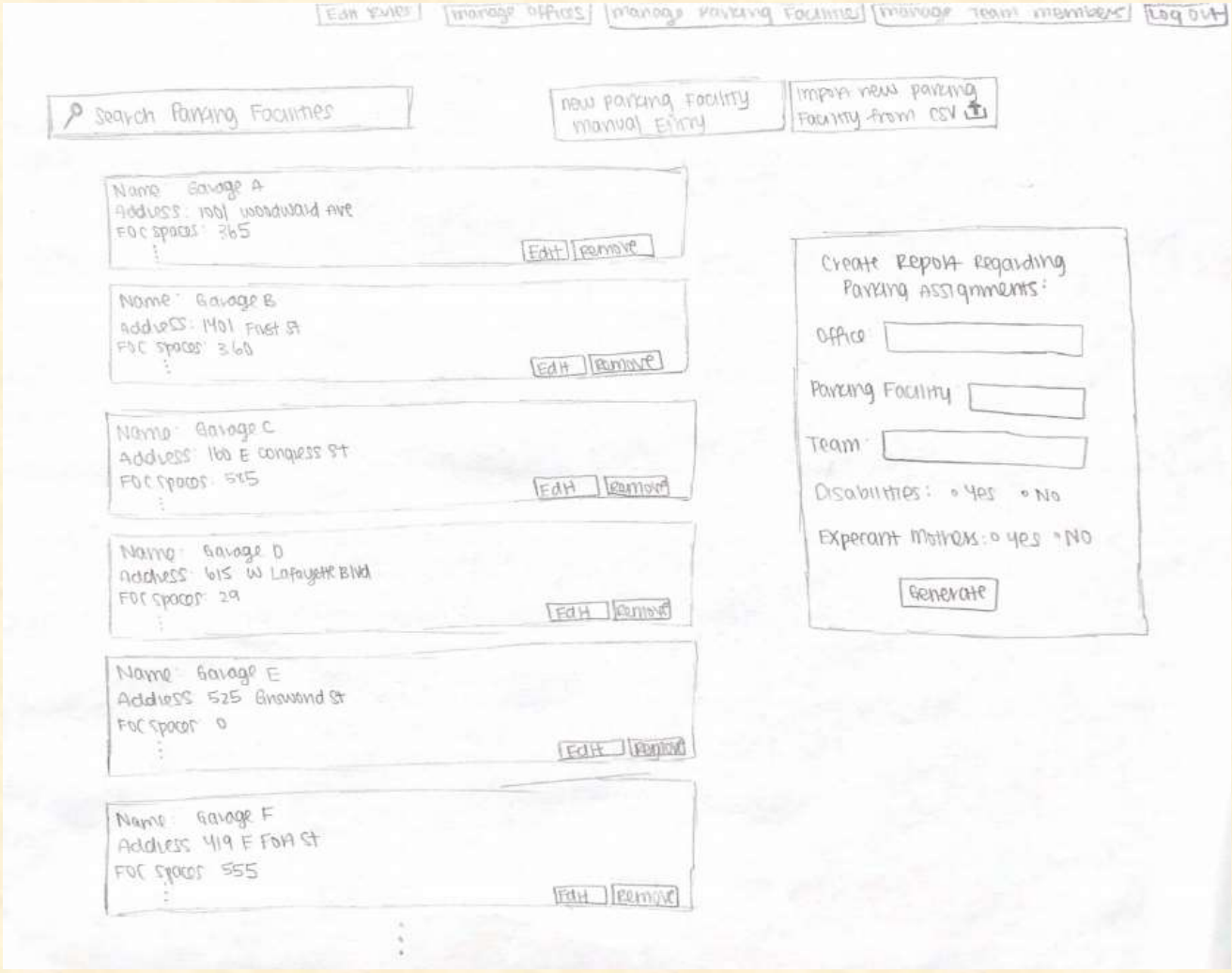
Design Specifications

- Import employee schedules from CSV file into a database
- Use a dynamic algorithm to determine optimal parking assignments for employees
- Design web application for administrators to allow them to create/edit/delete team members and work offices
- Handles approximately 25,000 employees

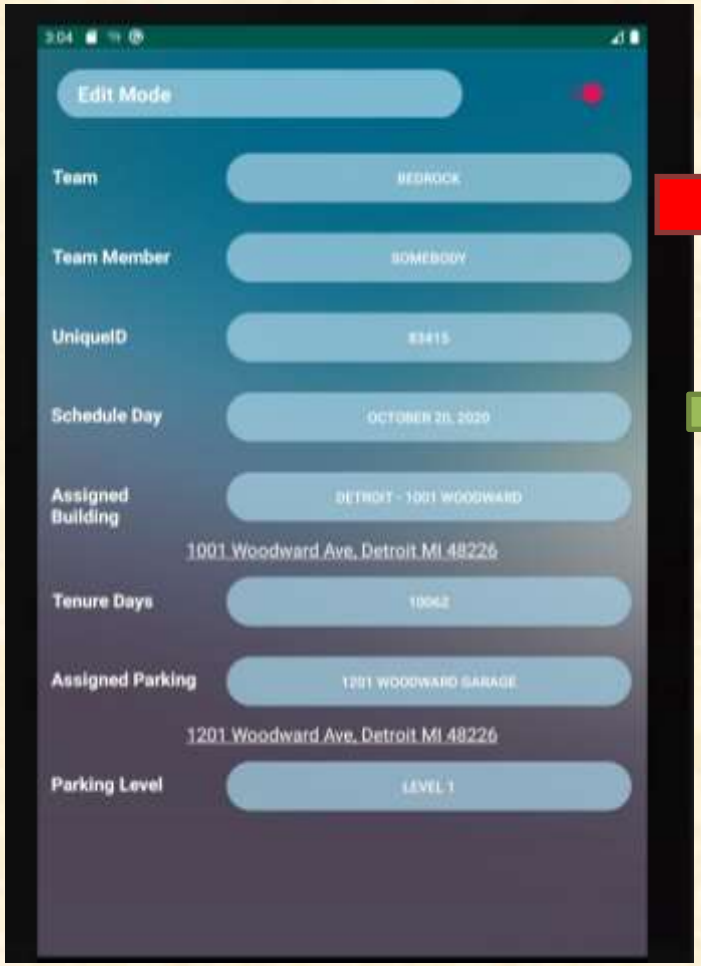
Screen Mockup: User Management

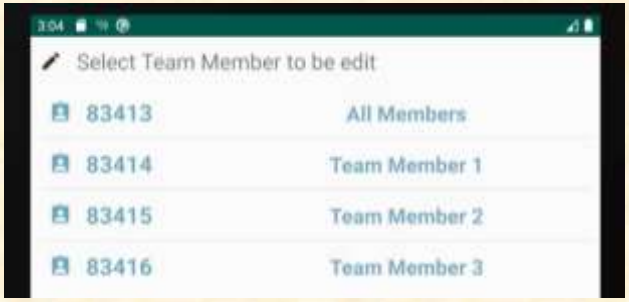


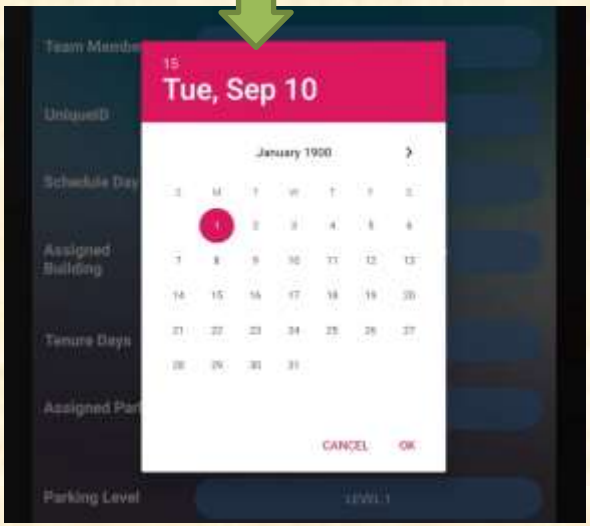
Screen Mockup: Parking Management



Screen Mockup: Admin Information





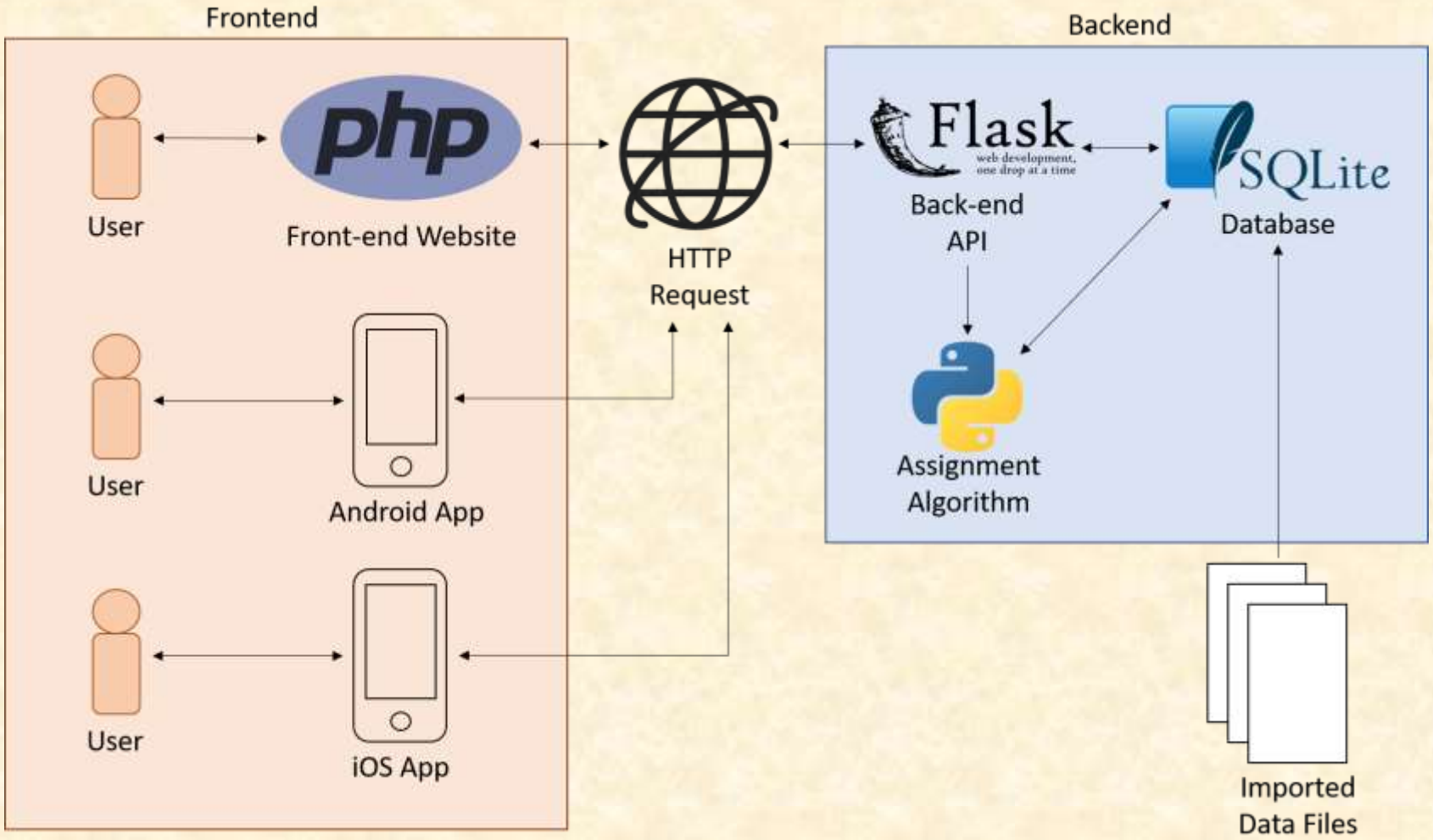


Screen Mockup: User Information

Technical Specifications

- Backend
  - Python
  - Geopy / Google Maps API
  - Sqlite3
- API
  - Auth0 user authentication
  - Flask
- Frontend
  - PHP
  - Xcode
  - Android Studio

System Architecture



System Components

- Hardware Platforms
  - iMac
  - iOS
  - Android
- Software Platforms / Technologies
  - PHP
  - Python
  - IntelliJ IDEs
  - Xcode
  - Android Studio
  - Google Maps API
  - SQLite

Risks

- API Security
  - Any of our internet traffic is at risk of being compromised
  - Integrate 0auth2 security through Auth0
- Run Time
  - The application will have to analyze over 25,000 employees
  - Create greedy algorithms that sort quickly and compare their run times to our main algorithm
- Making our API open to integration
  - The client is planning on creating their own software to interact with our API in the future.
  - After we create a new route, we will document it's use cases, inputs, and outputs, then test it with a different team member who didn't help build the route
- No assigned server location
  - The client has given us the opportunity to choose where to host the app
  - Setup the app locally, and then repeat the process on AWS

Questions?