Product Design Specification (Group Project)

Project Background

- Project title: GeoAttendance
- GitHub URL: https://github.com/bencejdanko/GeoAttendance
- Team name: GeoUnity
    - We chose this name because GeoUnity combines the idea of geolocation (Geo) with the concept of bringing people together (Unity).
- Team members: Da Thao Trinh, Bence Danko

Project Description

- Our project is a web based application. GeoAttendance leverages geofencing technology to enhance the accuracy and convenience of attendance tracking. Geofencing involves creating virtual boundaries in real-world geographic areas, only the users within the boundaries will be able to check-in. Upon checking-in, the users will receive an email which confirms their attendance status. Our website also provides real-time updates on attendance and historical attendance data as well.

Technology Used

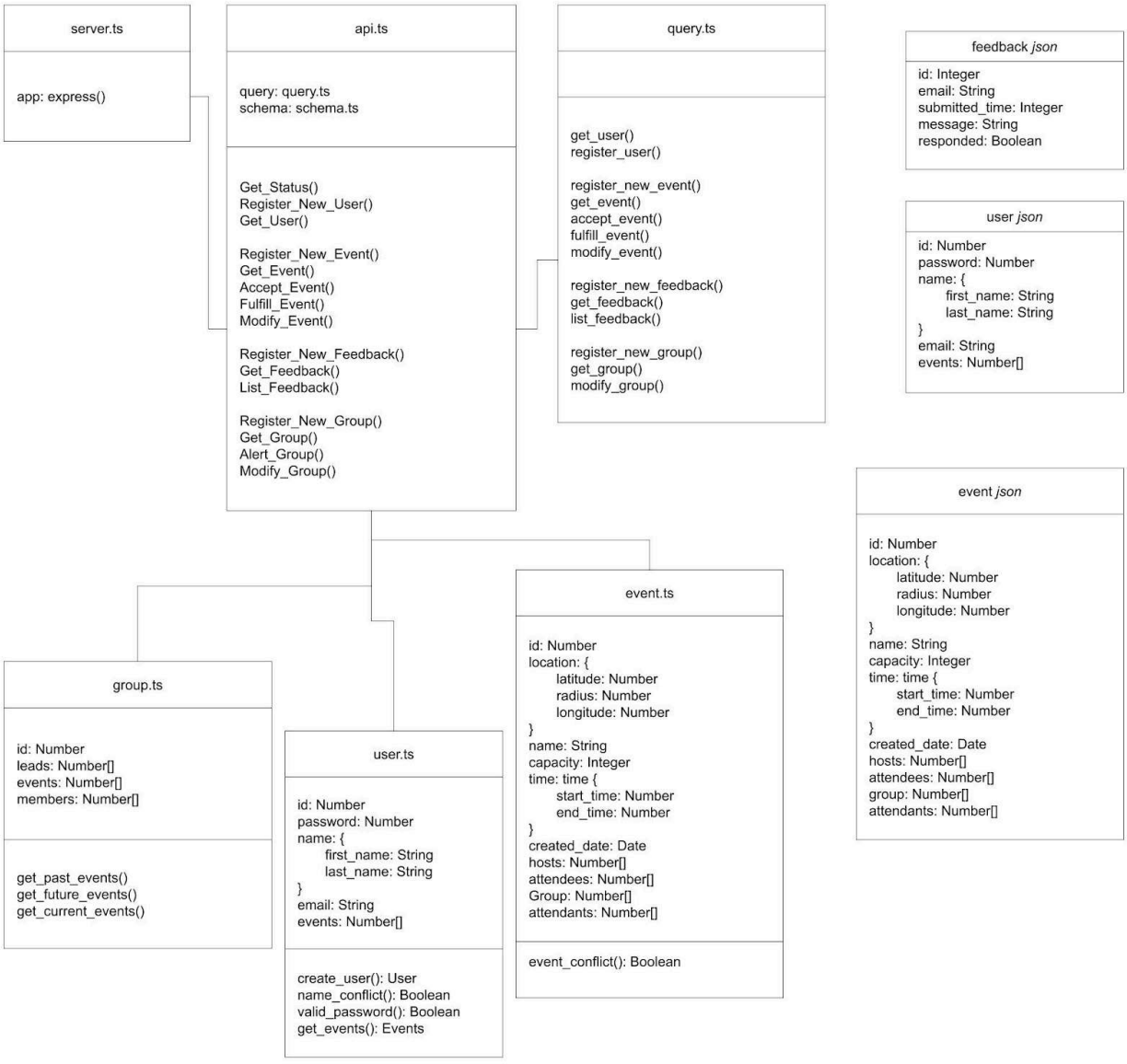
- Frontend: HTML, CSS, React, JavaScript
- Backend: Nodejs, PostgreSQL

Task Assignments

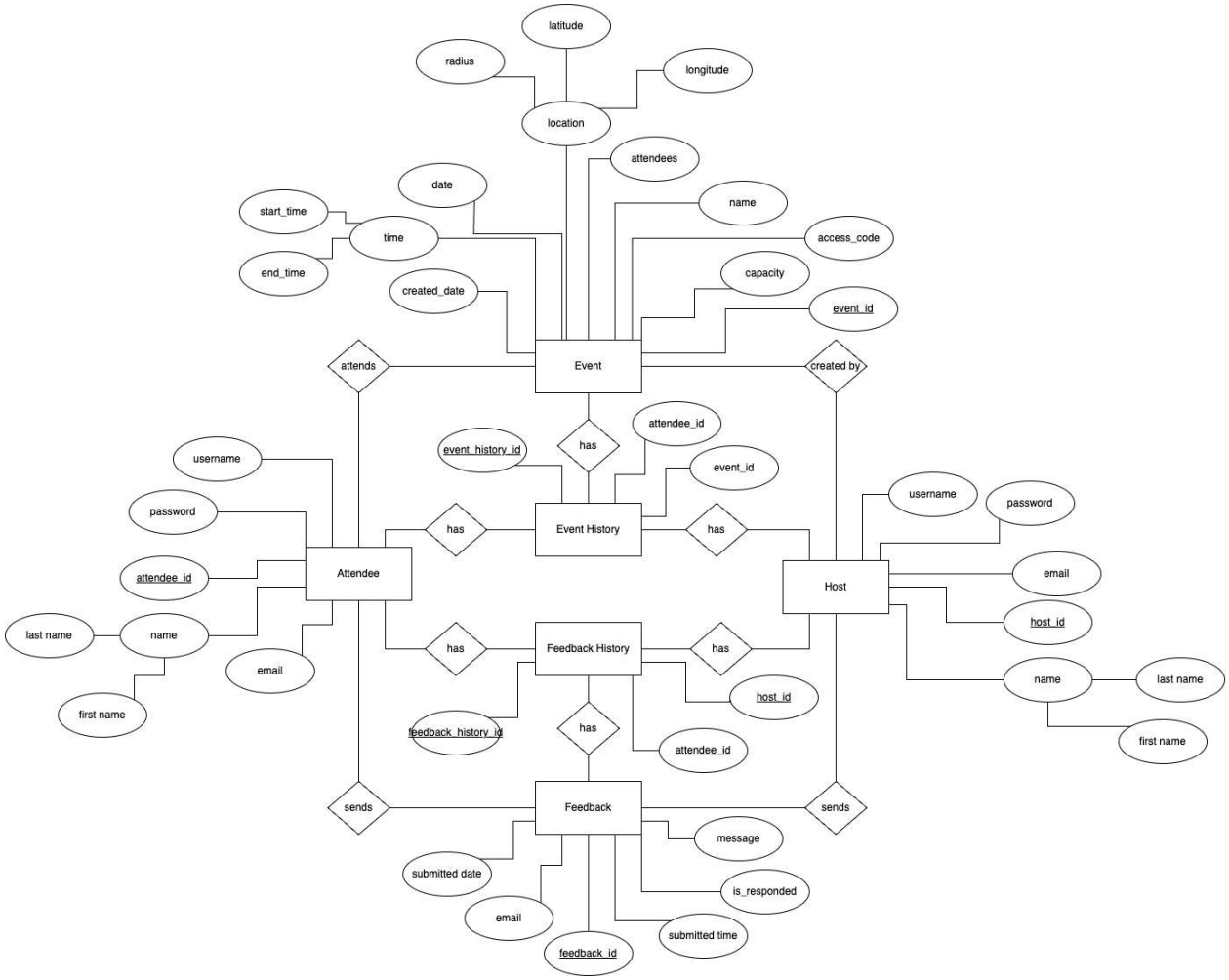
- Bence: Setup APIs, Backend work, Deployment & Testing.
- Da Thao: UX/UI Design, Frontend work, Deployment & Testing.

Diagrams

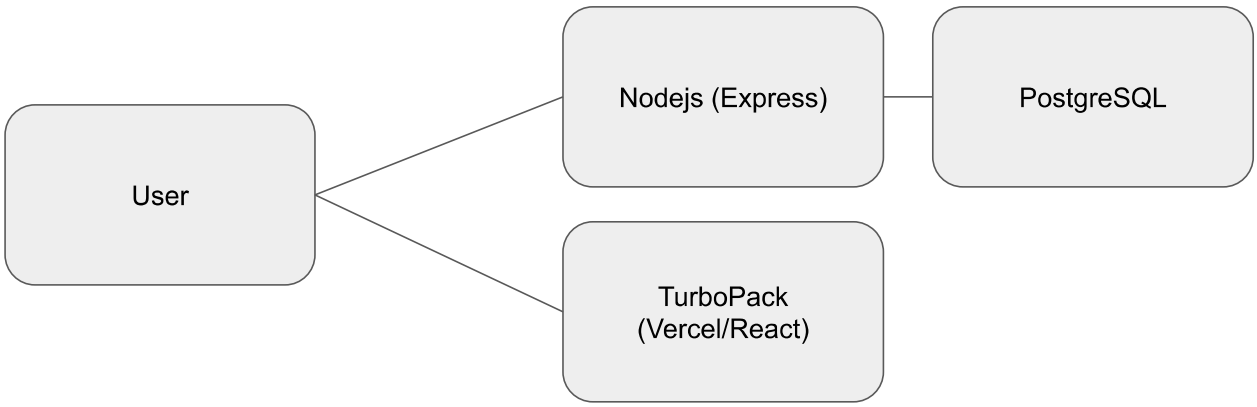
- UML Diagram



- ER Diagram



- System Diagram



Method used to solve the problem

GeoLib Library (https://github.com/manuelbieh/geolib)

- Correctness: tested with various inputs, including points inside and outside the circle, as well as edge cases such as at the center of the circle or when the inputs are undefined. Also handle negative coordinates and non-integer values.
- Complexity: O(1) - Haversine formula - Basic arithmetic operations.

Market space and selling points

- The application streamlines attendance tracking for professors and other hosts.
- Geomarking and online maps allows attendees to easily find meeting spots through their phone, without the hassle of going through manual instructions.
- An online application would easily allow the host to update events, or modify sign-ups. All attendees would simultaneously be able to track any changes or updates immediately, such as if a location were changed.
- (Stretch) Use facial recognition technology to improve the accuracy of the attendance tracking process.

Features

- User Registration and Authentication
    - Allow users to create new accounts.
    - Enable login via email.
- ~~User Profile Management~~
    - ~~Profile customization.~~
    - ~~View/edit account settings.~~
- Attendance Tracking using Geofencing Technology.
    - Geofencing involves creating virtual boundaries in real-world geographic areas, only the users within the boundaries will be able to check-in.
    - Upon checking-in, the users will receive an email which confirms their attendance status.
- Create managed Groups
    - Add, remove and alert users to new events
- Attendance Ranking
    - ~~Ranking the attendance of the users.~~
    - Provide historical attendance data per student
- Support and Bug Report (Feedback)
    - Contact form to send feedback.

Deployment

- Frontend
    - Push code to our git repository.
    - Import our React project into Vercel.
    - Vercel will detect that we are using React and will enable the correct settings for our deployment.
    - Our application is deployed!

Source: https://vercel.com/guides/deploying-react-with-vercel

- Backend
    - Run API on local network
    - Port forward local network address and port
    - API exposed to frontend requests

Milestones

- Milestone 1 (2/5 - 2/16): Initialize technology frontend, backend development environments.
- Milestone 2 (2/19 - 3/22): Build User API, UI for Login and Registration Forms.
- Milestone 3 (3/25 - 4/12): Implement Geolib library, UI for Attendance Check-ins & Testing.
- Milestone 4 (4/15 - 4/26): Testing/Deployment
- (Stretch) Milestone 5 (4/29 - 5/13): Integrate Facial Recognition/AI Technology.