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Project Backlog: BoilerNav

(Team 13)

Problem Statement:

We would like to solve the issue of individuals being unfamiliar to Purdue's campus and its building layouts. While current maps provide outdoor navigation on Purdue's campus, they do not provide indoor navigation inside buildings. Our goal is to develop an application that features both outdoor and indoor navigation capabilities as well as other interesting features.

Background Information:

The problem we wish to solve is that there is no overall navigation system for Purdue University's campus that encompasses both inside of buildings and outside of buildings. The domain would be within the Purdue campus. Our targeted users would be Purdue staff and faculty, Purdue students, and guests of the Purdue campus. There are other systems that function similar to our application. OpenStreetMap data, etc all serve as outdoor navigation. They do not, however, provide indoor navigation within buildings. We will be implementing indoor navigation specifically on the Purdue campus to address such limitations and develop additional navigation features that current applications do not provide such as custom routes, a feedback system, and more.

Requirements:

Functional Requirements

General:

1) As a user, I would like to go through a tutorial for using various parts of the app

Outdoor Navigation UI:

2) As a user, I would like to view an outdoor map of Purdue's campus

3) As a user, I would like to pan, zoom, and scroll around in the outdoor map.

4) As a user, I would like to select Purdue's buildings to view their indoor floor plans.

5) As a user, I would like to view information on bike routes.

6) As a user, I would like to view information on bike racks.

7) As a user, I would like to view information on parking lots.

8) As a user, I would like to view information on bus routes and stops.

9) As a user, I would like to select a building to travel to on Purdue's campus.

10) As a user, I would like to search for a building to travel to on Purdue's campus.

11) As a user, I would like to have route durations to the nearest minute.

12) As a user, I would like to be rerouted if I stray off the path.

13) As a user, I would like to receive real-time GPS updates.

Indoor Navigation UI:

14) As a user, I would like to select which floor I am on for indoor navigation.

15) As a user, I would like to select start/destination routes on the current floor for indoor navigation.

16) As a user, I would like to search for start/destination rooms on the current floor for indoor navigation.

17) As a user, I would like to see the duration of routes for indoor navigation.

18) As a user, I would like to have multiple routes for indoor navigation if routes are of comparable time.

19) As a user, I would like to be rerouted if I stray off the path for indoor navigation.

User Accounts and Features (Outdoor & Indoor UI):

20) As a user, I would like the option to create an account.

21) As a user, I would like the option to login to my account.

22) As a logged in user, I would like the option to update my account information (username, password, etc.).

23) As a logged in user, I would like the option to delete my account and associated data.

24) As a logged in user, I would like to create personal routes for outdoor navigation.

25) As a logged in user, I would like to create personal routes for indoor navigation.

26) As a logged in user, I would like to save frequently used destinations.

27) As a logged in user, I would like to select from my favorite locations and be routed from my current location to the selected location.

28) As a logged in user, I would like to add personal route times to outdoor routes.

29) As a logged in user, I would like the option to make my personal routes private.

30) As a logged in user, I would like to share my personal routes with other users.

31) As a logged in user, I would like to submit a schedule and receive outdoor routing based on the schedule.

32) As a logged in user, I would like to send rooms and locations in buildings to developers/administrators to help build indoor maps.

33) As a logged in user, I would like to be able to flag if a part of the indoor and outdoor maps are inaccurate/vandalized.

34) As a logged in user, I would like to submit feedback (delays, accidents, construction. etc) on the given routes.

35) As a logged in user, I would like to create favorite locations to be routed to.

Security/Feedback/Accuracy/Visualizations/Other:

36) As an elevated user/administrator, I would like to review requests for map updates from logged in users.

37) As an elevated user/administrator, I would like an option to ban certain users from flaggings/sending map info if their information is intentionally inaccurate/spam.

38) As an elevated user/administrator, I would like the option to view and rollback to previous versions of the map.

39) As a user, I would like to view visualizations of the most popular routes on Purdue's campus.

40) As a user, I would like to view visualizations of the most popular rooms in a selected building on Purdue's campus.

41) As a user, I would like to view a real time heat map of route congestion.

42) As a user, I would like to see distances in metric and imperial (choice).

43) As a user, I would like to book rooms through Purdue's websites.

44) As a user, I would like the route info to be sent to my email once I book a room.

45) As a user, I would like to be routed through buildings when the weather is bad.

Hardware (if time allows)

46) As a user, I would like to get my real-time altitude in order to detect what floor I am on indoors.

47) As a user, I would like to get the direction I am facing using a gyroscope.

48) As a user, I would like to receive a more refined real-time position using a GPS and WIFI positioning for indoor and outdoor navigation

Non-Functional Requirements:

Usability:

- Application should be available on web browsers

    Application should have intuitive ui

- Application should be easily usable as an outdoor and indoor navigation tool

- Realtime outdoor location data

- Live real time interior location data (if time allows)

- ~10 or less meter location accuracy (if time allows)

Security:

- The application should be secure and be protected against map vandalism.

Performance:

- Application should provide duration of routes to the nearest minute.

- Application should support requests from multiple users (1000+) and have reasonable response time (< 5 ms)

Scalability:

- Application should allow users to mark locations and rooms in buildings, which will help scale the app.

Deployment:

- The application will be hosted on Heroku, Render, or another service and should be available to users 24/7.