GuideSense

Your Trusted Navigation Companion

Team: Power Angers

Sprint 1

Agenda

1. Team Member
2. Project Overview
3. Technologies & Tools
4. Team Logistics
5. MVP
6. Diagrams
7. Sprint 1 Recap
8. Burndown Chat
9. Sprint 2 – Spring planning
10. Project Demo

Power Anger

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**Improved based on Professor's feedback

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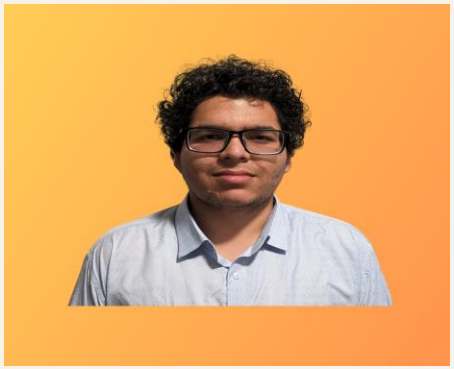

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Problem Statement

- Navigating through everyday environments presents significant challenges for blind and visually impaired individuals., moving vehicles, and the lack of real-time guidance.
- Traditional mobility aids like canes and guide dogs, while helpful, often fall short in providing comprehensive and real-time information about obstacles, directions, and surroundings.
- This lack of real-time situational awareness can lead to increased risks of accidents and restrict the independence of visually impaired individuals.
- Therefore, there is a pressing need for an innovative solution that leverages modern technology to enhance mobility and safety for the visually impaired community.
- This project aims to create a web app that uses object detection and voice commands to help blind people navigate safely by warning them about obstacles, giving directions, and describing their surroundings in real time.

Project Description

- This innovative web app leverages computer vision and machine learning to provide real-time audio guidance, identifying objects, obstacles, and crosswalks for the blind and visually impaired.
- Combining GPS and AI object detection, it aims to make it easier and safer for blind people to get around independently, especially in cities and outdoor areas.
- The goal is to provide a helpful, accessible, and dependable way for visually impaired people to navigate.

Key features of the application include:

- Real-time Object Detection
- Voice Navigation and Alerts
- GPS Integration
- User-Friendly Interface

Team Working Agreement

CS-691 SPRING 2025
TEAM WORKING AGREEMENT
TEAM-POWER ANGERS

Communication

- Team will Communicate with each other through Email and WhatsApp
- There is going to be a team meeting where all 8 members are required to join on every Tuesday after 9pm.
- Technical Team meeting where developers would join the call for brief about the tasks and the updates it will be on tuesday and thursday at 9pm
- Team members are expected to update beforehand if the they are going to be absent for the meeting and asked to be updated till the next meeting
- Each team member should complete the given task before the deadline.In some one case was not able to do so then they should inform it to the rest of the team so they could divide the task

Work Division and Participation

- The entire project work should be divided into equal parts and equal responsibility should be given to all team members.Mebers are expected to select and contribute to the task in which their skill are best fit.
- Jira, Github will be used to track and divide all our work
- Every team member should update about their task 2 times in a week.

- Each team member should complete their part of work before the deadline.If one fails to do so immediately report to the rest of the teammates and take assistance.
- In case a team member is absent in the team meeting,members must support the decision taken in the meeting.

Team Working Agreement

Respect

- It is essential that all team members have a chance to share their opinion and make any suggestion without judgement.The team project is team effort,taking advantage of collective knowledge to come up with solutions.
- All members agree to respect each other's personal schedules and listen to each other's perspective.

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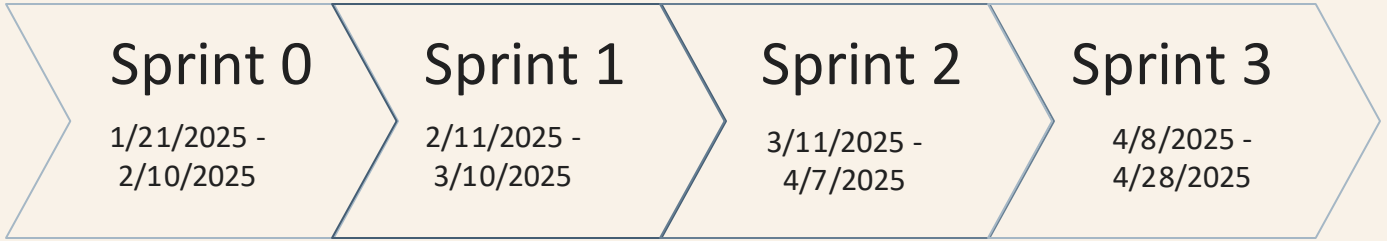
Project Schedule



- Daily Scrum
- Retrospective
- Deliverable – Persona, tech & tool, stories breakdown

- Daily Scrum
- Scrum Planning
- Retrospective
- MVP (Authentication, YOLO, Map)
- Design Diagrams

- Daily Scrum
- Scrum Planning
- Retrospective
- Connect Users
- Connect all components
- Text to Speech

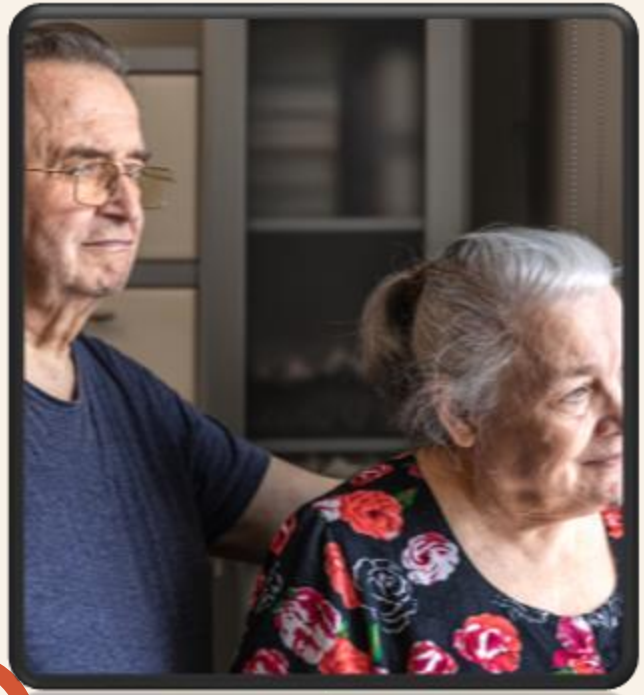
- Daily Scrum
- Scrum Planning
- Retrospective
- Final product

**Improved based on Professor's feedback

Persona One: The Independent Blind User

- **Name:** Aisha Khan
- **Age:** 32
- **Occupation:** Software Developer (works remotely)
- **Background:** Aisha has been blind since birth. She is highly tech-savvy and relies on assistive technology. She is motivated to use tools that enhance her independence and streamline daily activities.
- **App Usage Scenario:** Aisha wants to use the app for navigation while walking, especially in unfamiliar areas, and identify objects which could be a barrier for seamless tasks.
- **Needs:** Seamless integration with existing assistive technologies (screen readers, voice control), accurate location services, reliable information about accessible routes and environments, and robust privacy features.
- **Goals:** Increased independence, improved access to information, enhanced safety while navigating, and streamlined daily task management.

Persona Two: The Concerned Family Member



- **Name:** Robert Chen
- **Age:** 65
- **Relationship:** Son of a visually impaired senior
  "I worry about my mother's safety. I hope this app can help me stay connected and ensure she's doing okay."
- **Background:** Robert's mother is losing her vision due to macular degeneration. He lives in a different city and wants to stay connected and provide support remotely.
- **App Usage Scenario:** Robert wants to use the app to track his mother's location (with her consent), receive alerts if she deviates from her usual routes, remotely assist her with tasks like medication reminders, and communicate with her easily through the app's accessible interface.
- **Needs:** User-friendly interface, reliable location tracking (with privacy safeguards), remote assistance features, accessible communication tools, and clear instructions for setup and use.
- **Goals:** Increased peace of mind, improved communication with his mother, ability to provide remote support, and enhanced safety for his visually impaired parent

Persona Three : Partially sighted Teenager

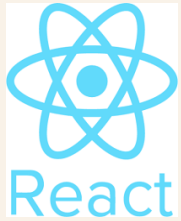
- **Name:** David Miller
- **Age:** 16
- **Background:** David has low vision due to a genetic condition. He can see some things with the aid of glasses or magnifiers.

"I want to be able to do the same things my friends do. I hope this app can help me navigate more easily and access information."

- **App Usage Scenario:** David wants to use the app to magnify text and images, identify colors, navigate public transportation, and access audio descriptions of videos and other media. He needs an app that is easily customizable to his specific visual needs.
- **Needs:** Customizable display settings (font size, contrast, color schemes), reliable object and text recognition features, seamless integration with magnification tools, and accessible interface that can be used with limited vision.
- **Goals:** Increased independence, improved access to information, enhanced social participation, and greater confidence in navigating the world.

Technologies & Tools

Programming Language



Database

Tools

AI Model

YOLO, which stands for ‘You Only Look Once,’ is a state-of-the-art object detection model known for its real-time speed and accuracy.

- Real-time Speed: Processes the entire image in a single pass, making it one of the fastest models for object detection.
- Grid-Based Detection: Divides the image into a grid, with each cell responsible for detecting objects within it.
- Accurate Bounding Boxes: Predicts precise bounding boxes and confidence scores for each detected object.
- Pre-trained on COCO: Leverages the massive COCO dataset (80 object categories, 200,000+ images) for robust and accurate general object detection
- Refined Results: Uses Non-Maximum Suppression (NMS) to eliminate overlapping detections and ensure only the most accurate results are shown.

MVP

1. Object Detection
   - Object detection in real time
2. Google Map API
   - Route detection
3. User Authentication
   - Sign Up / Sign In

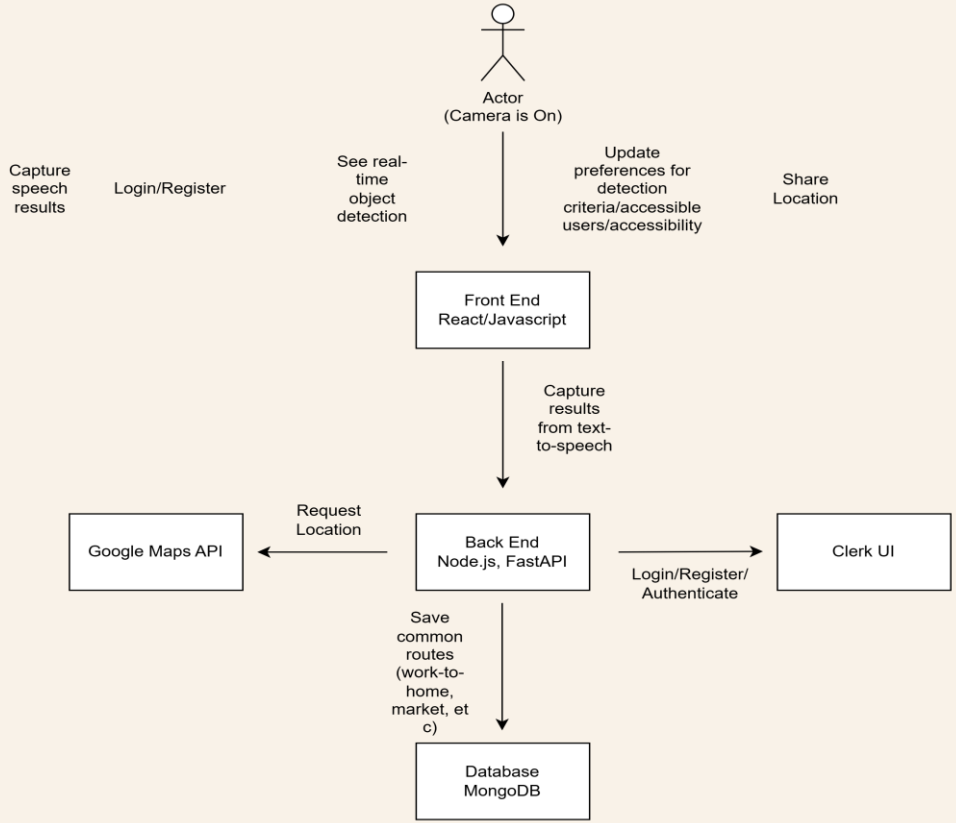
MVP

- A client (web browser) connects to the server and sends a WebRTC offer
- The server sets up a peer connection, processes the offer, and sends back an answer
- When video starts streaming from the client, each frame is:
  - Received by the server
  - Processed through YOLO (object detection)
  - Enhanced with visual indicators (boxes around objects)
  - Sent back to the client in real-time

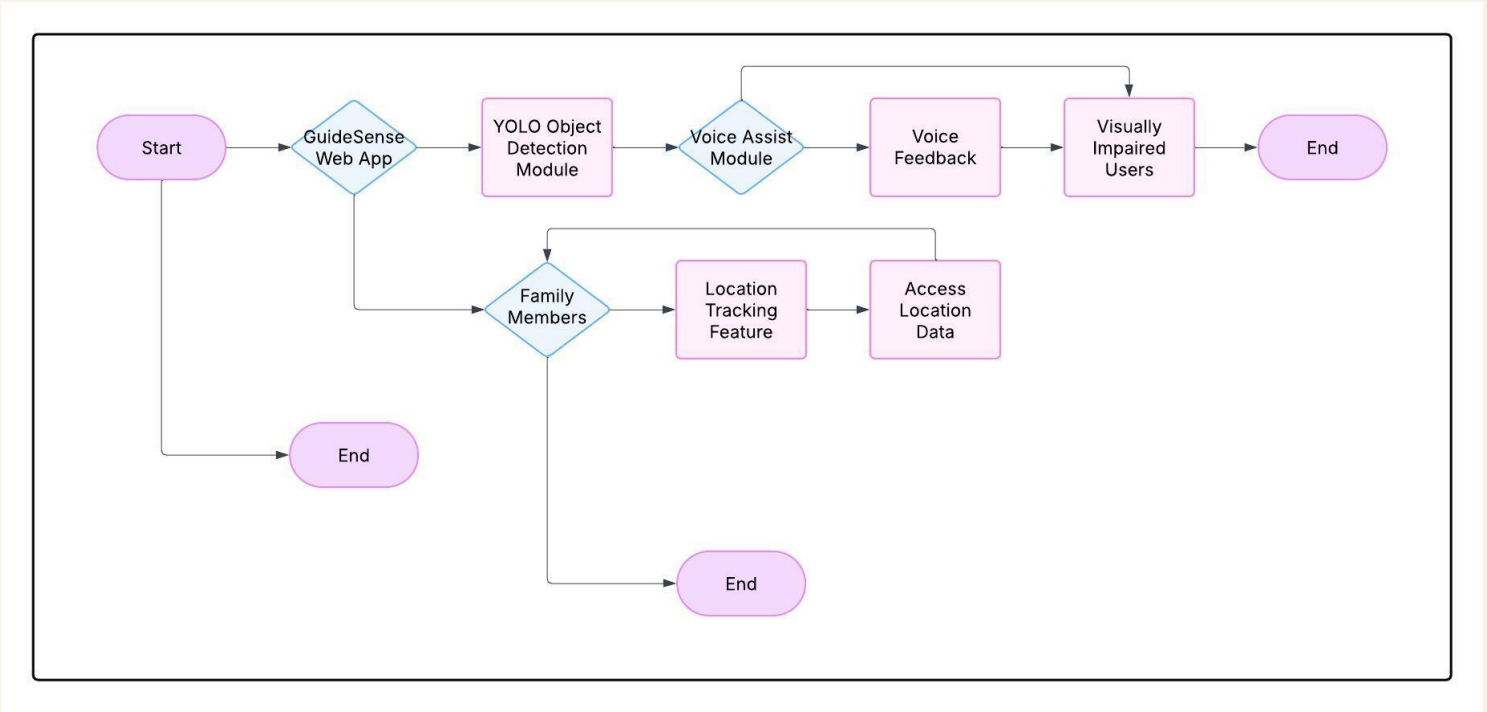
Frameworks /APIs

- FastAPI: FastAPI is a modern, high-performance web framework for building APIs with Python.
- WebRTC: WebRTC is open-source tech for direct browser-to-browser communication without plugins. It powers peer-to-peer applications with minimal overhead.
- Google Maps API: https://developers.google.com/maps/apis-by-platform

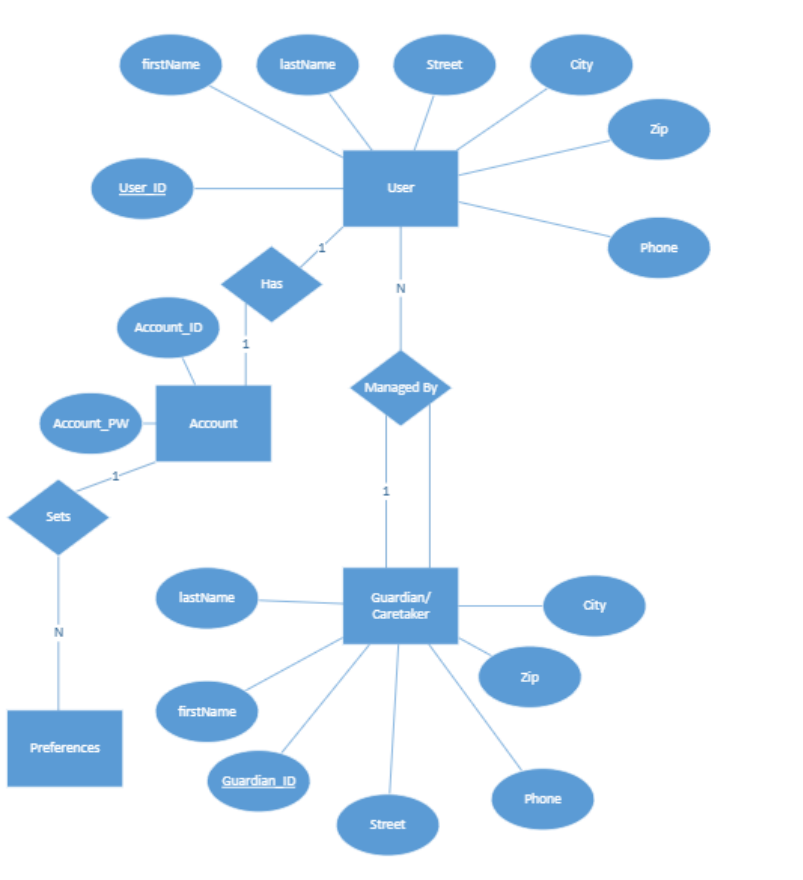
Architecture Diagram



Context Diagram



ER Diagram


firstName
lastName
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Managed By
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Phone
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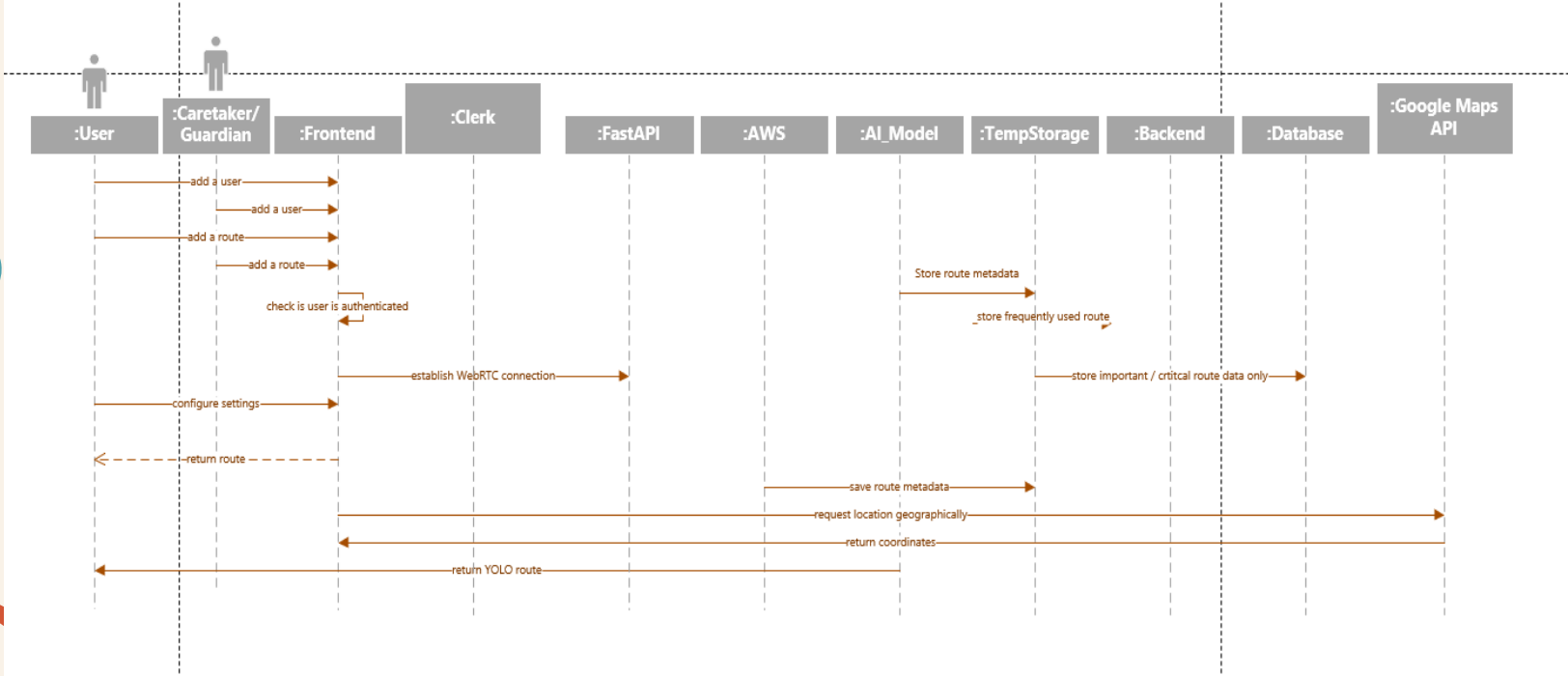
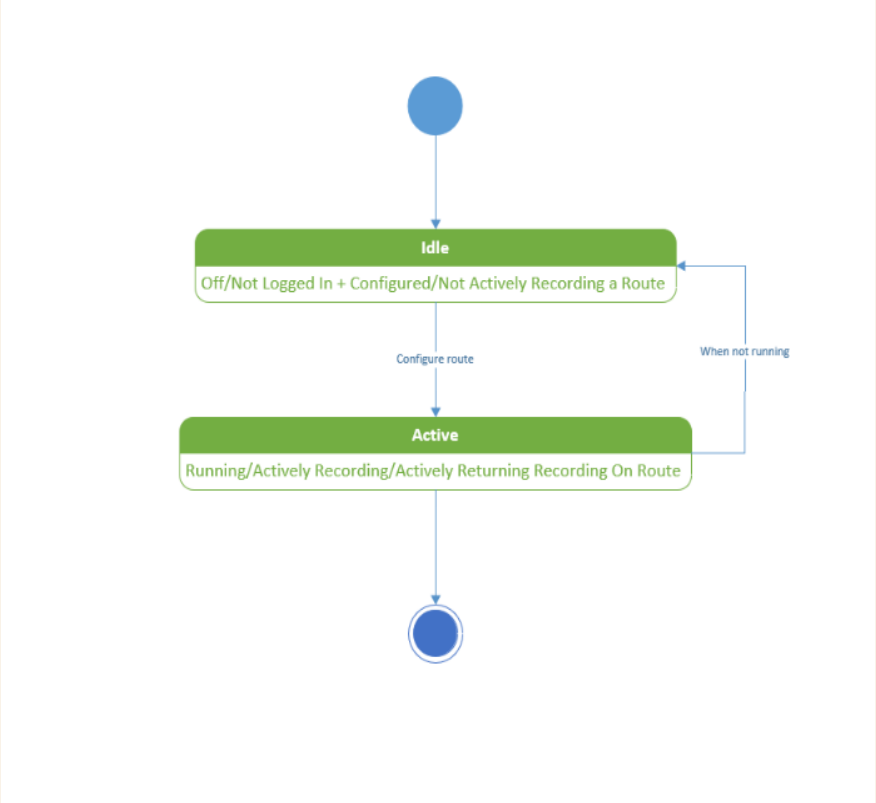
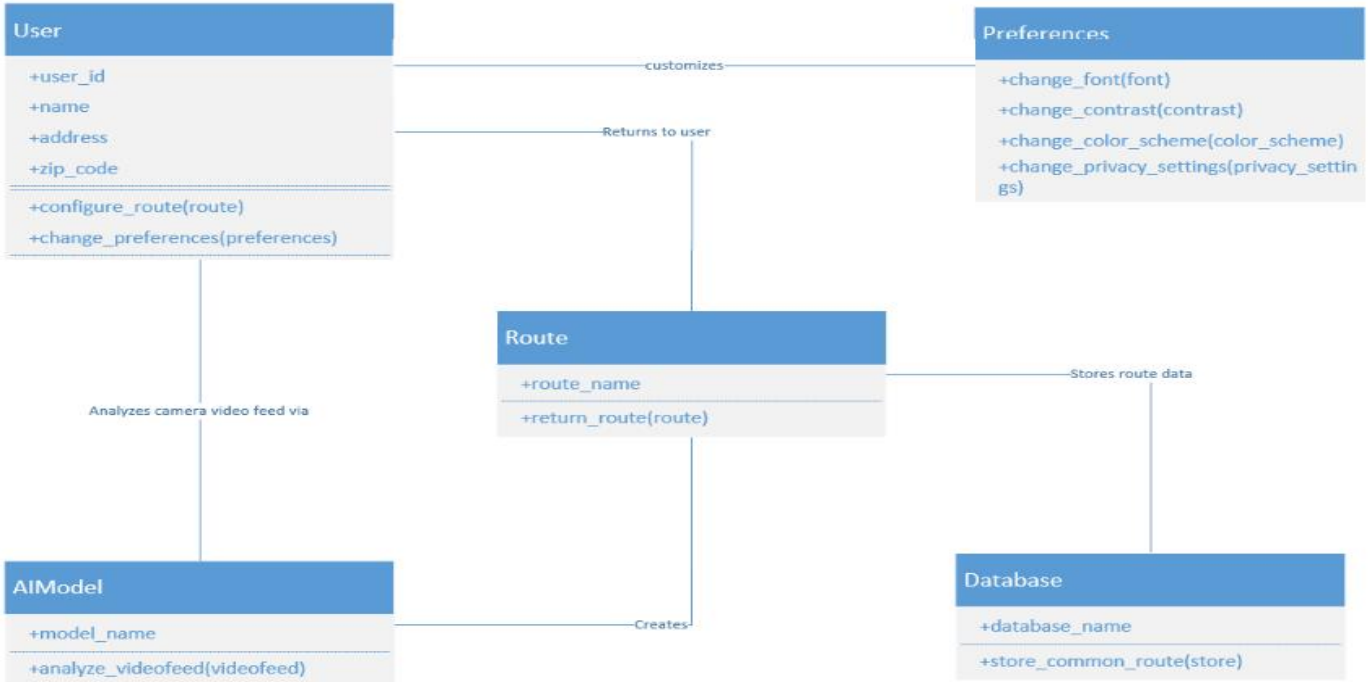
Sequence Diagram



State Diagram



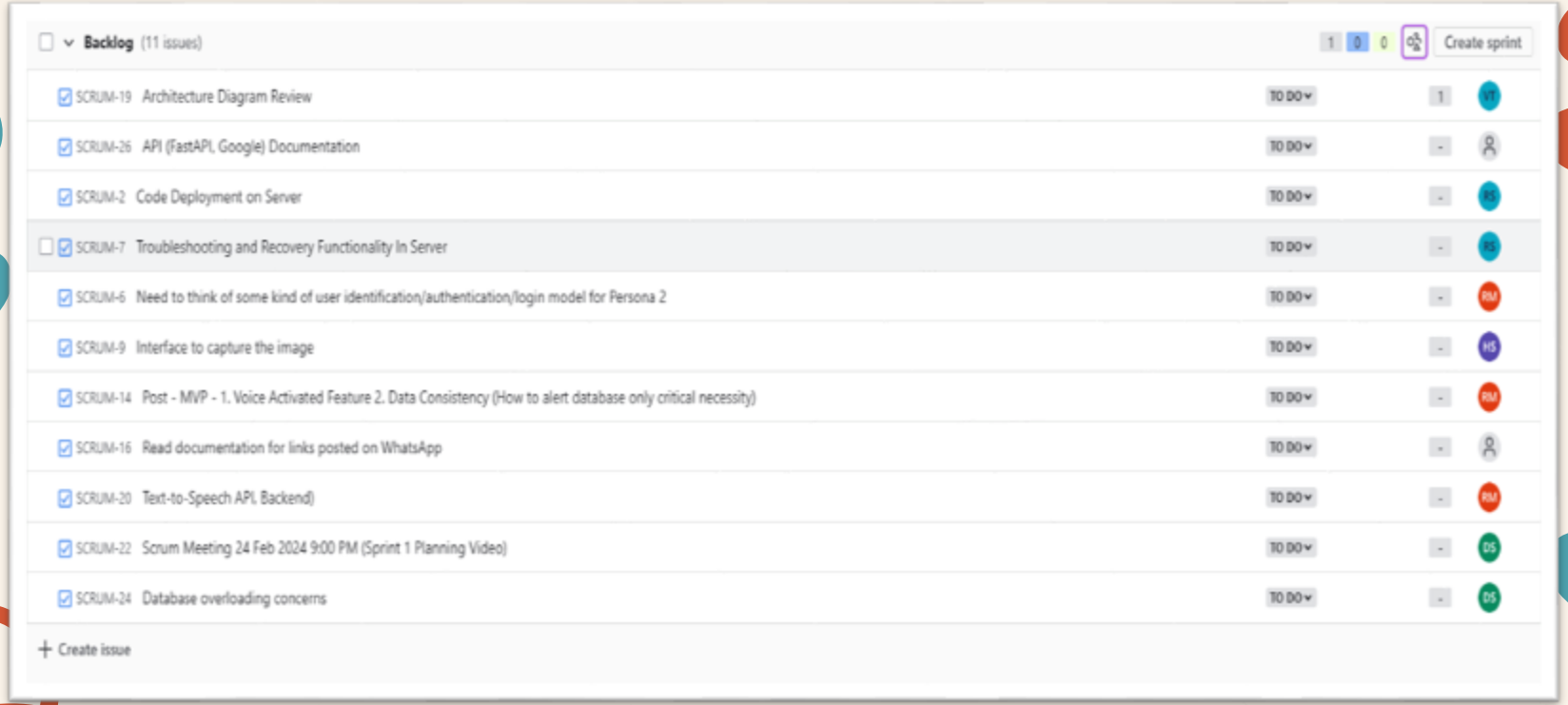
Class Diagram



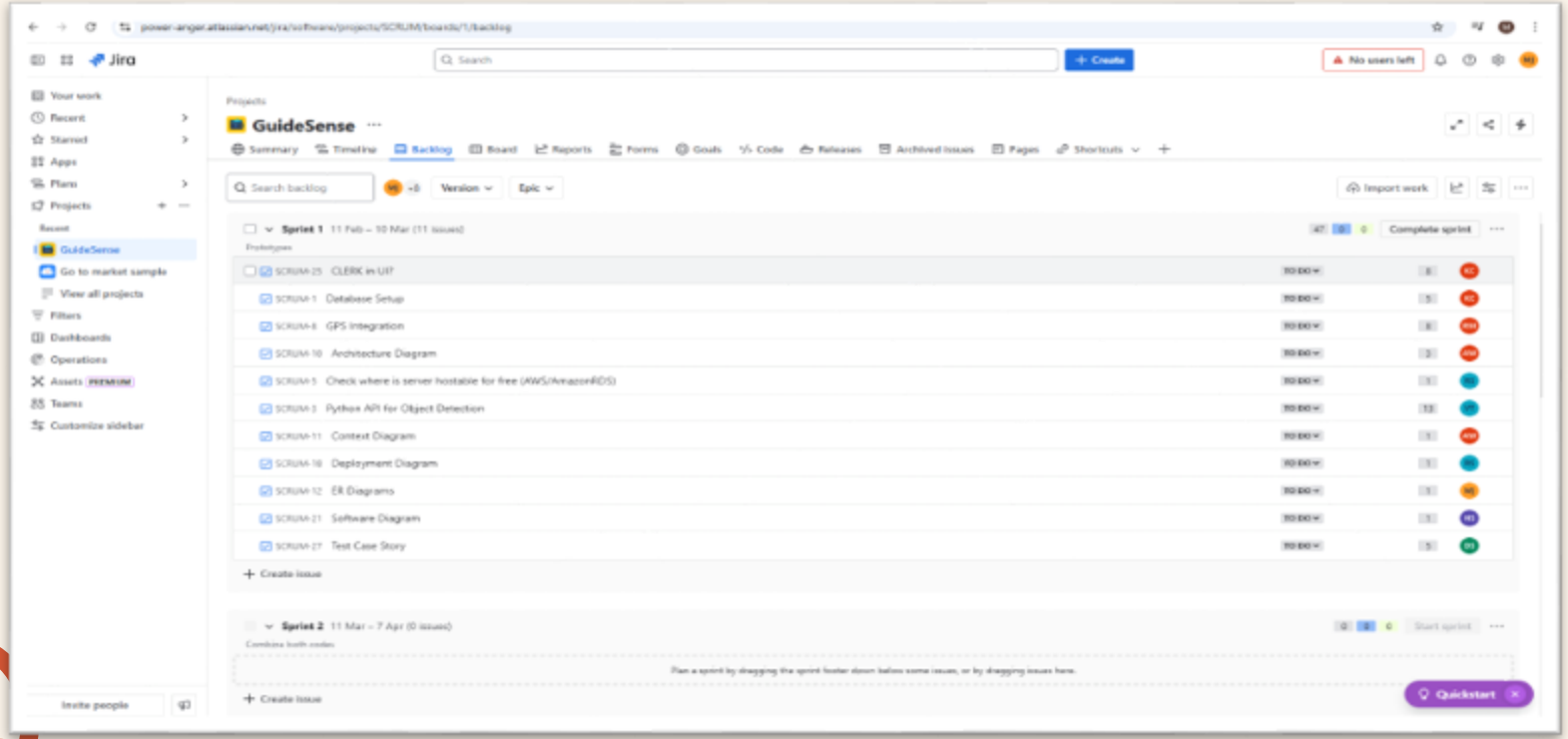
Sprint 1 Recap

1. Implemented YOLO Module
2. Implemented Authentication
3. Designed application diagrams
4. Established services for database and server
5. Implemented Google Map API for route detection

Product Backlog



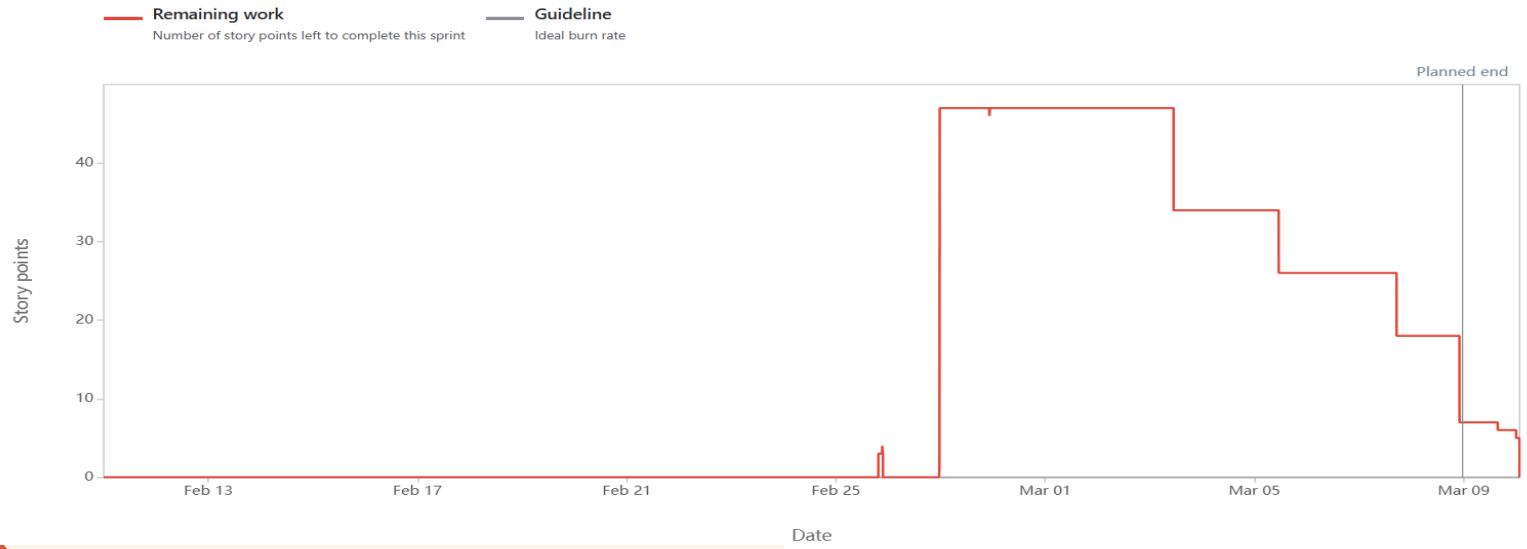
Sprint 1 – Sprint Planning



Sprint 1 – Burndown Chart

Date - February 11th, 2025 - March 8th, 2025

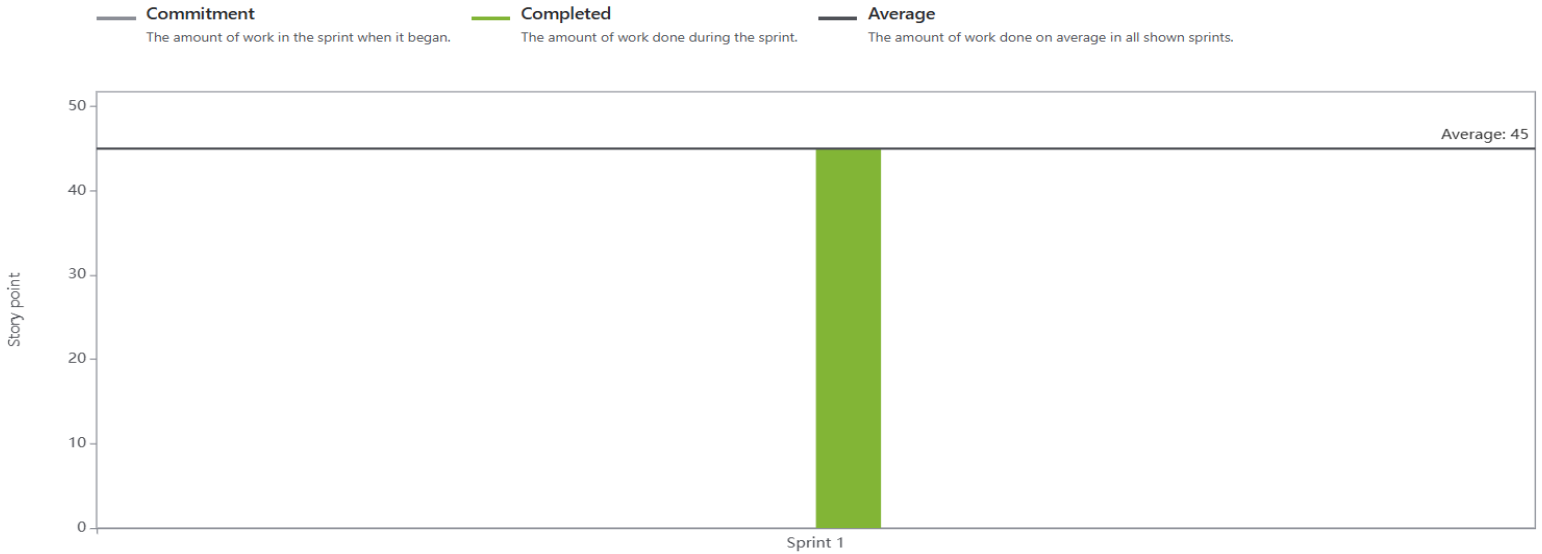
Sprint goal - Prototypes



Your sprint commitment has increased by 45 story points

Due to scope changes: You have 45 story points to complete this sprint

Sprint 1 – Team Velocity & Committed Ratio



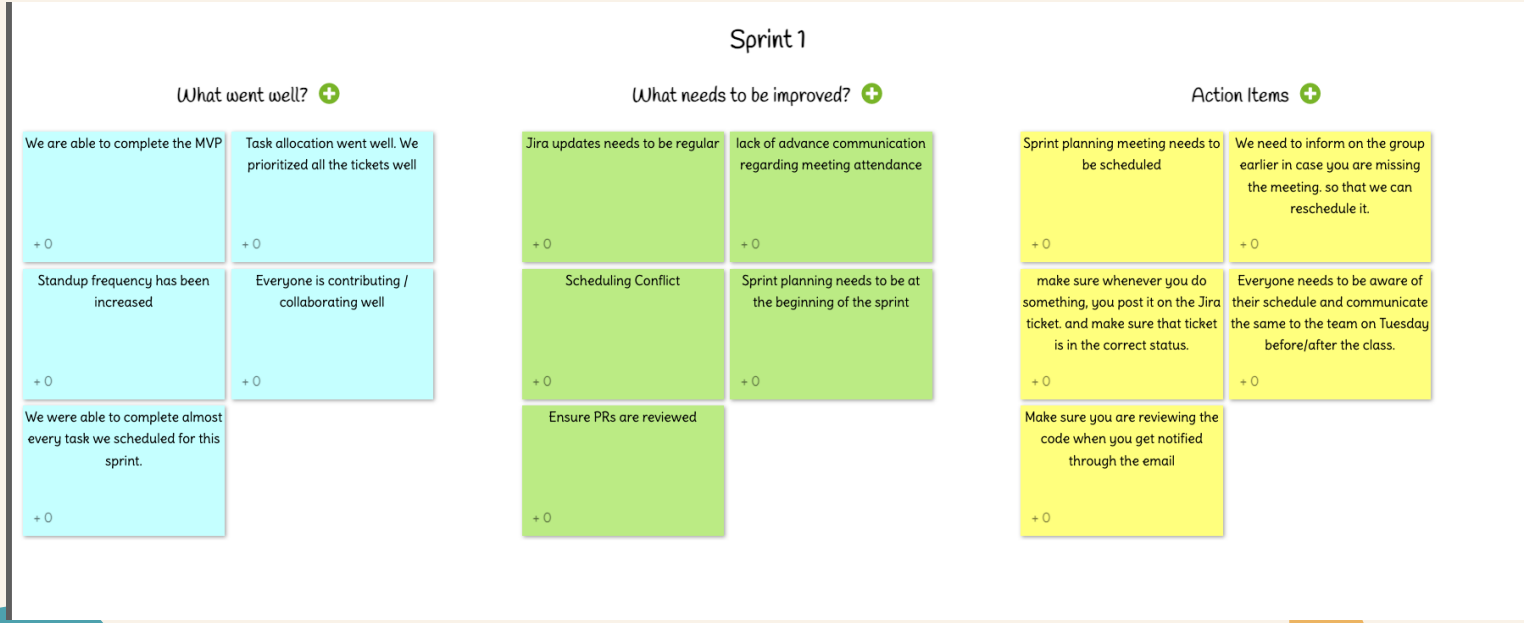
Sprint	Commitment	Completed
Sprint 1	0	45

Out of a total 45 committed story points, 45 story points were completed. The committed ratio is **100%.**

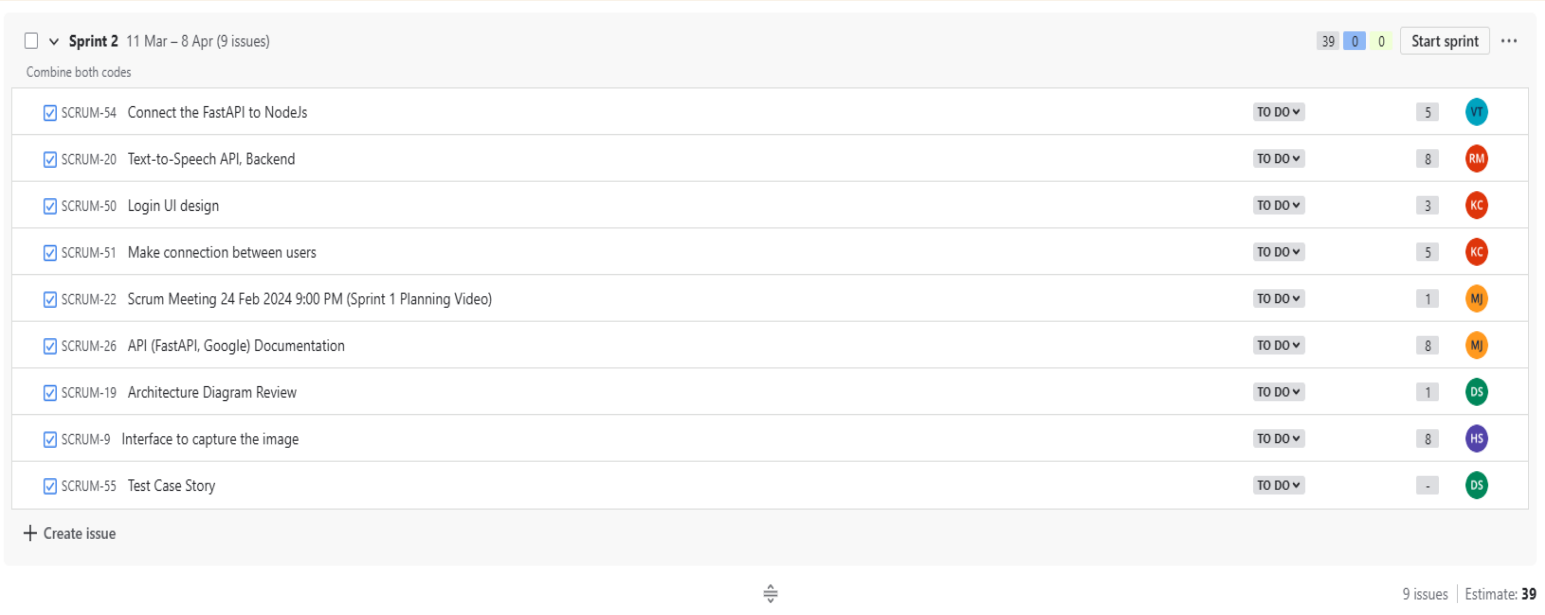
Retrospective – Sprint 0

What went well?	What need to improve	Action Items
Everyone was active on Whatsapp	Calls frequency and participation	Schedule a zoom call and add it in our calendar
Everyone collaborated in coming up with project ideas	Need to document what everyone is doing	Setup Jira for Project management.
Respected each other's opinions	Everyone needs to speak during the meeting.	Start early for sprint 1
Team coordination was good		

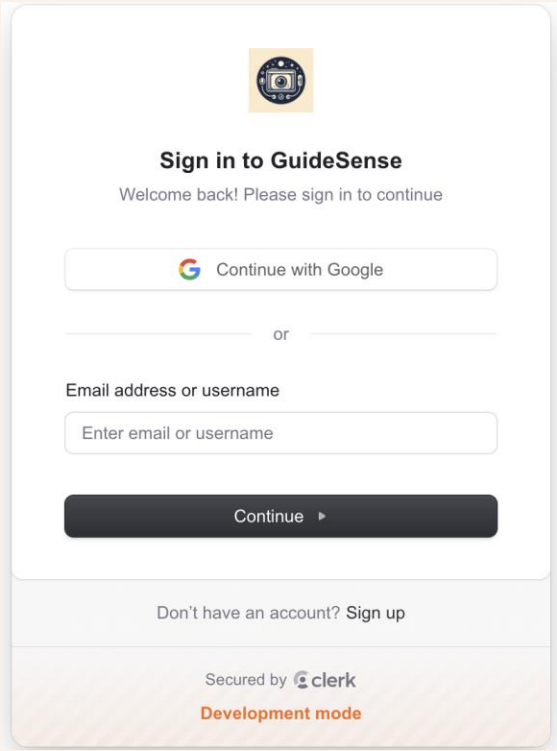
Retrospective – Sprint 1

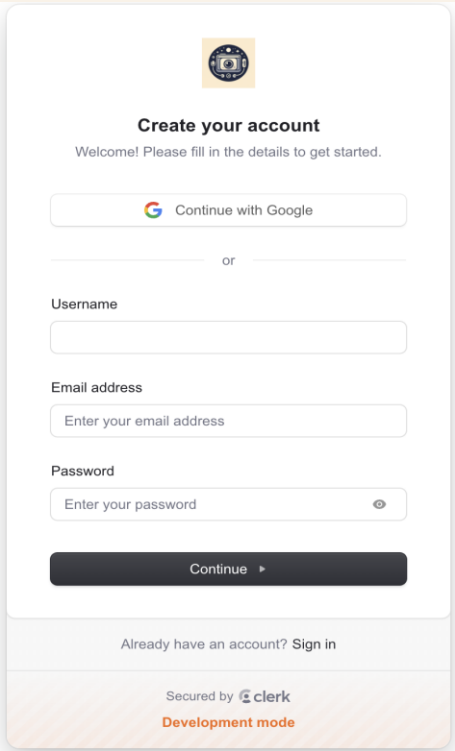


Sprint 2 – Sprint Planning

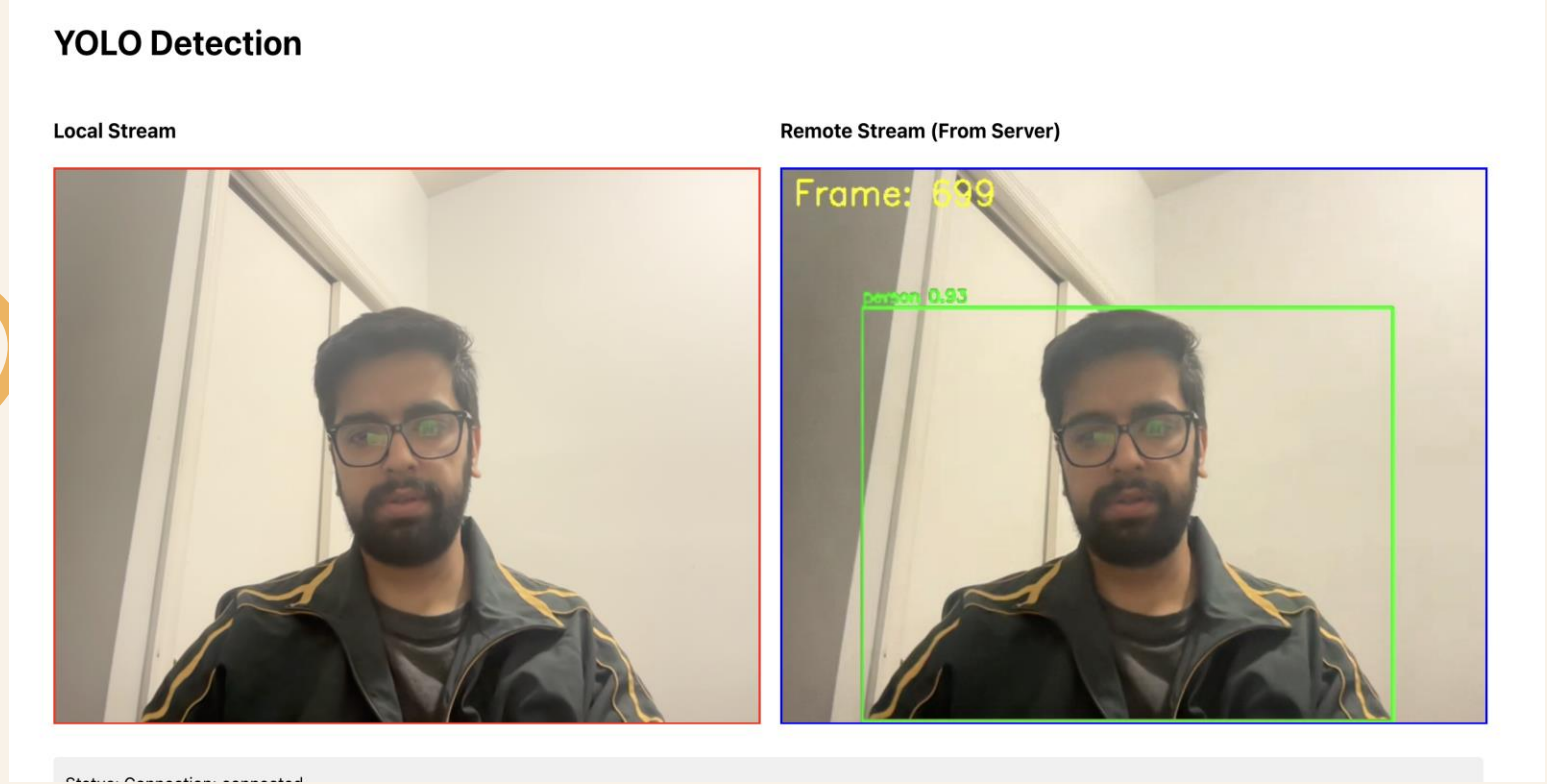


Sprint 1 – Project Demo

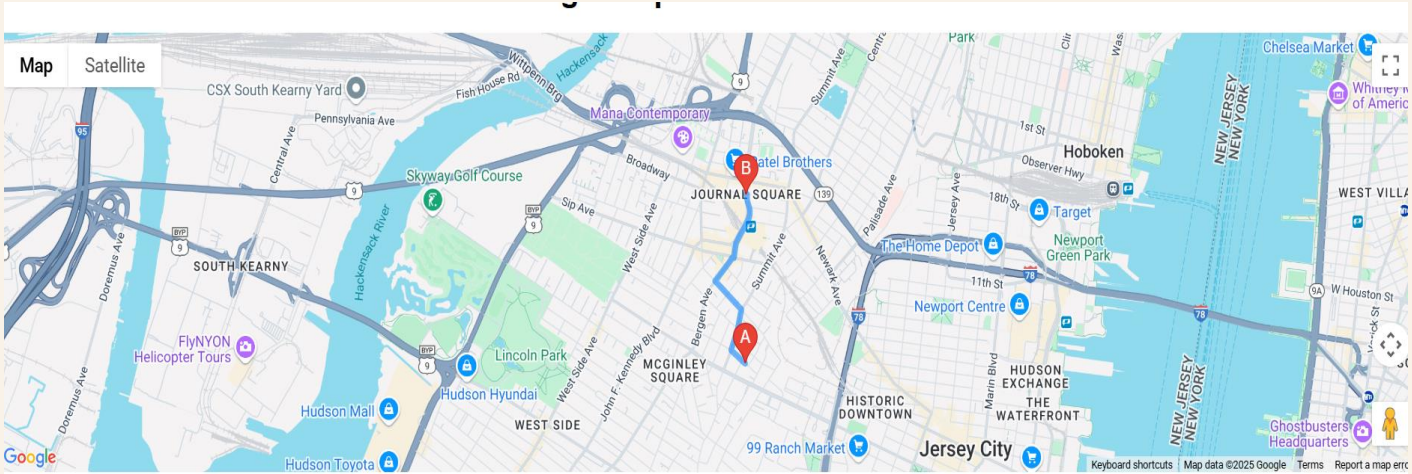




Sprint 1 – Project Demo



Sprint 1 – Project Demo



466 Mercer Street 07302

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Get Directions

Project Wikipage Link

https://github.com/htmw/2025S-Power-Anger/wiki

Live Application Demo