

# 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 Chart

9

Sprint 2 – Spring  
planning

10

Project Demo

# Power Anger



Afziya Waknis

Project Manager/  
Developer  
Aw14091n@pace.edu



Kaiyin Chen

Database Administrator  
Kaiyin.chen@pace.edu

# Power Anger



Ritesh Singh

Developer  
Ritesh.singh@pace.edu



Dinesh Gopi Sunkara

Developer  
Ds46669n@pace.edu

# Power Anger



Rushabh Makwana

Backend Developer  
Rm36294n@pace.edu



Vaibhav Thapliyal

**Developer Lead**  
Frontend Developer  
Vaibhav.thapliyal6@gmail.com

# Power Anger



Min Jung

Quality Analyst  
Mj34564n@pace.edu



Hrishikesh Shah

Frontend Developer  
Hs75142n@pace.edu

# 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 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. Members 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.

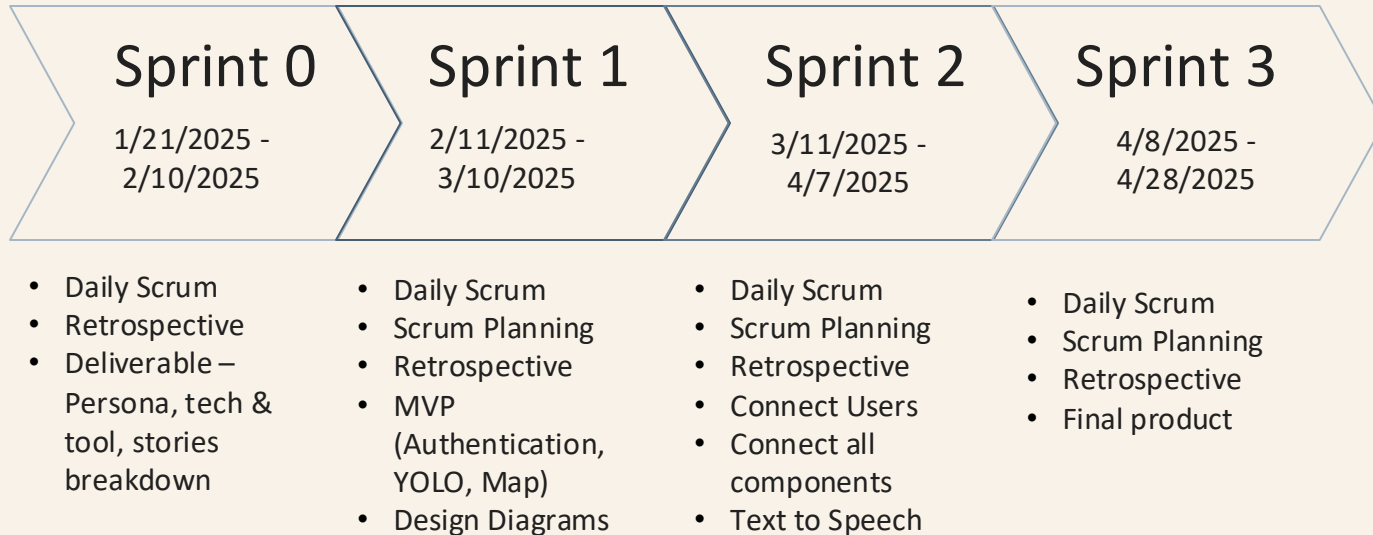
# Team Working Agreement

## 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.

TEAM MEMBERS	EMAIL
Afziya Waknis	aw14091n@pace.edu
Kaiyin Chen	kaiyin.chen@pace.edu
Ritesh Singh	rs98576n@pace.edu
Dinesh Gopi Sunkara	ds46669n@pace.edu
Rushabh Makwana	rm36294n@pace.edu
Vaibhav Thapliyal	vt18517n@pace.edu
Min Jung	mj34564n@pace.edu
Hrishikesh Shah	hs75142n@pace.edu

# Project Schedule



\*\*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

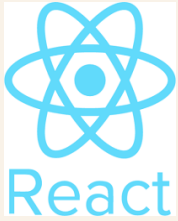


- ❑ **Name:** David Miller
- ❑ **Age:** 16
- ❑ **Background:** David has low vision due to a genetic condition. He can see some things with the aid of glasses or magnifiers.

"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

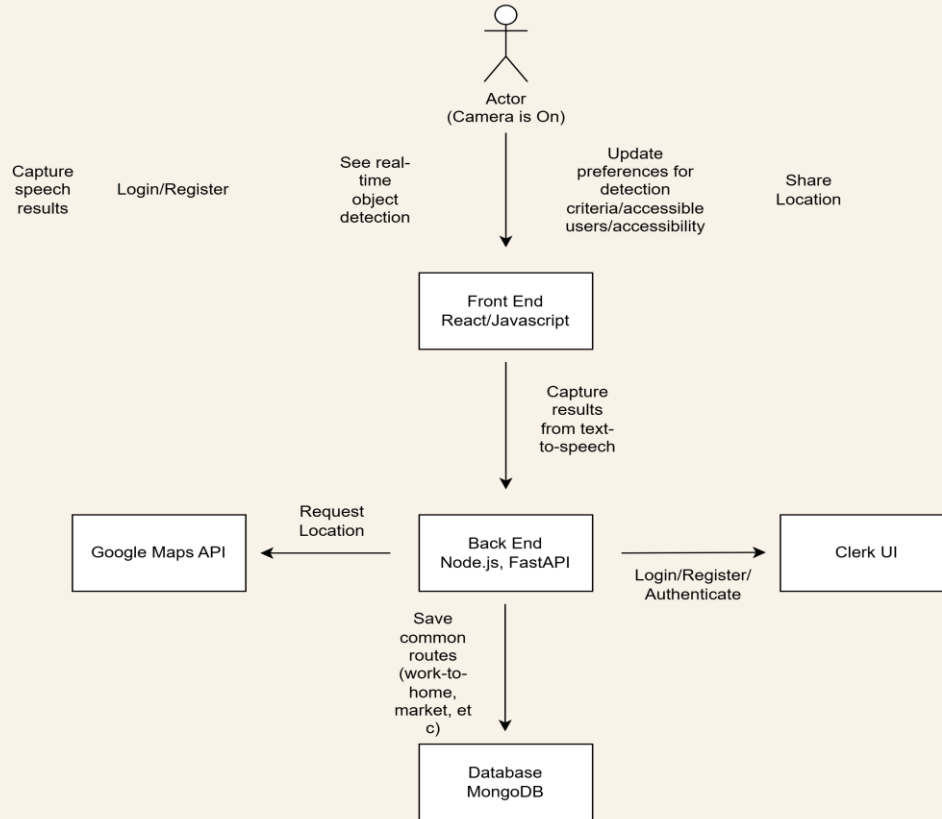
# MVP

- 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

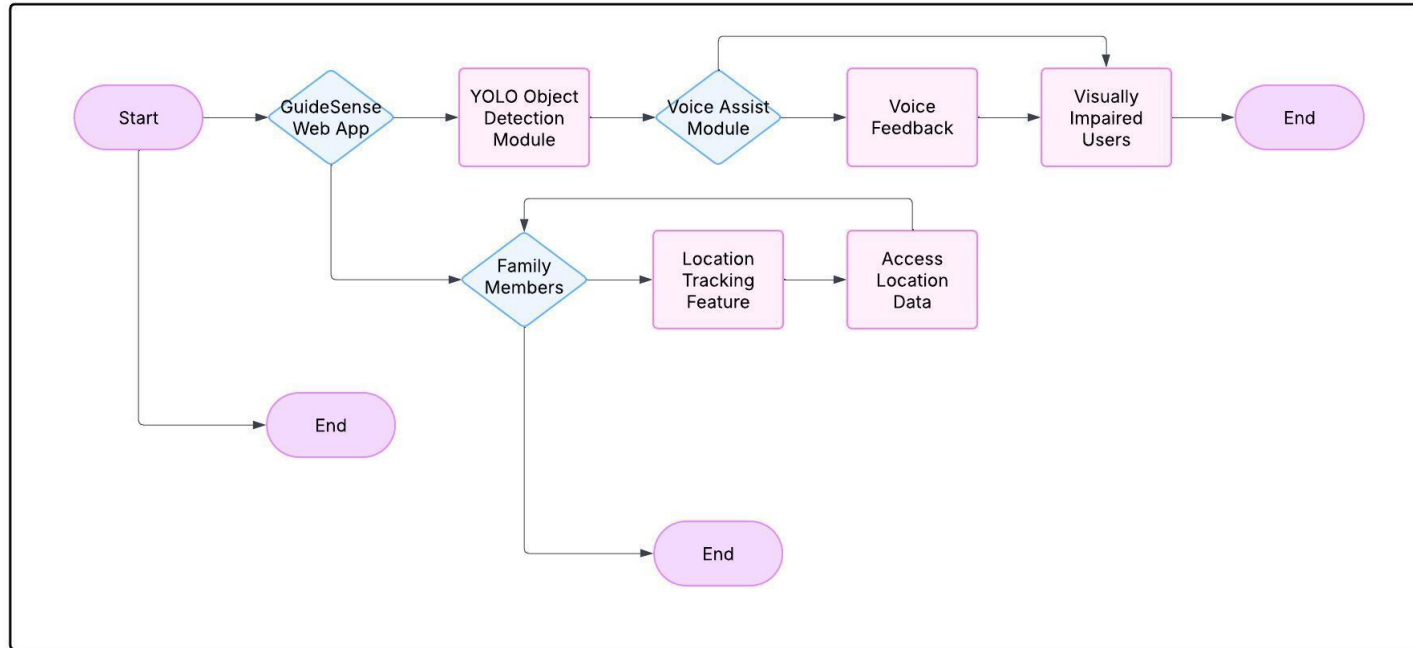
# Frameworks /APIs

- 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>

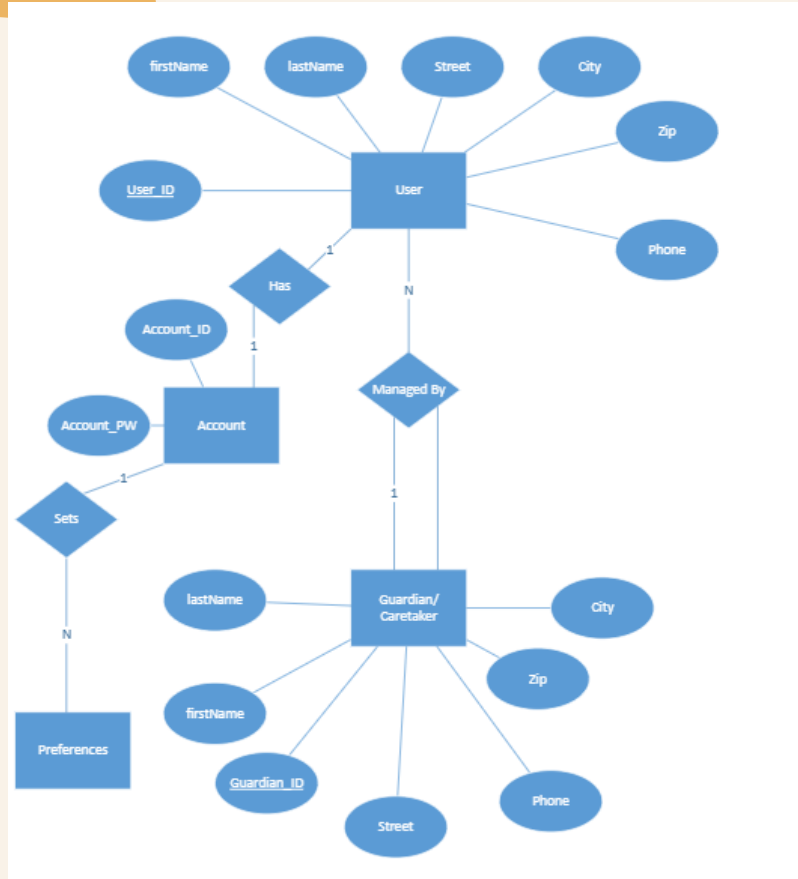
# Architecture Diagram



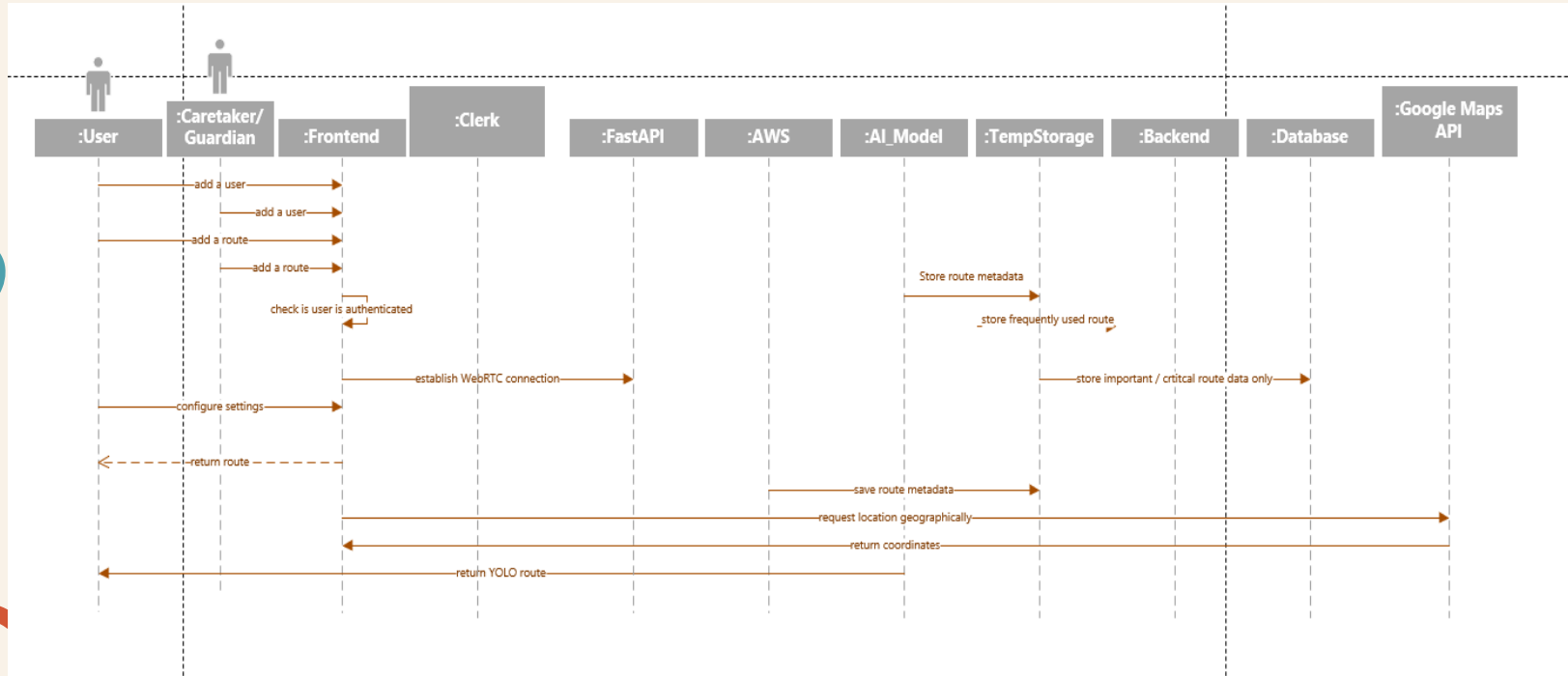
## Context Diagram



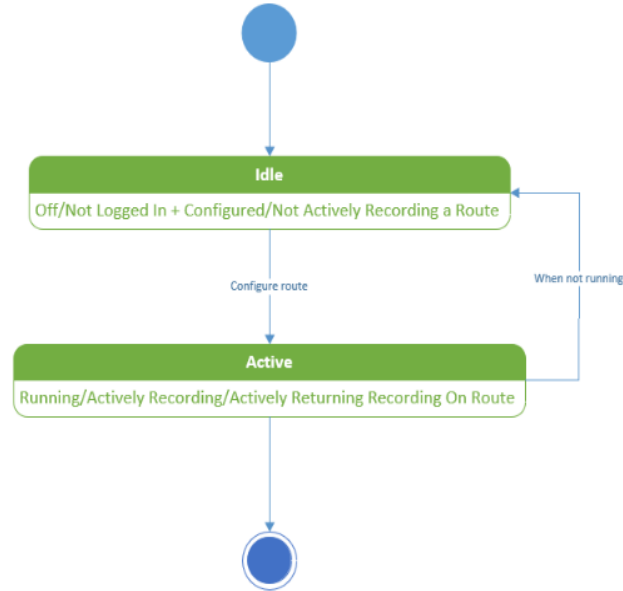
## ER Diagram



# Sequence Diagram

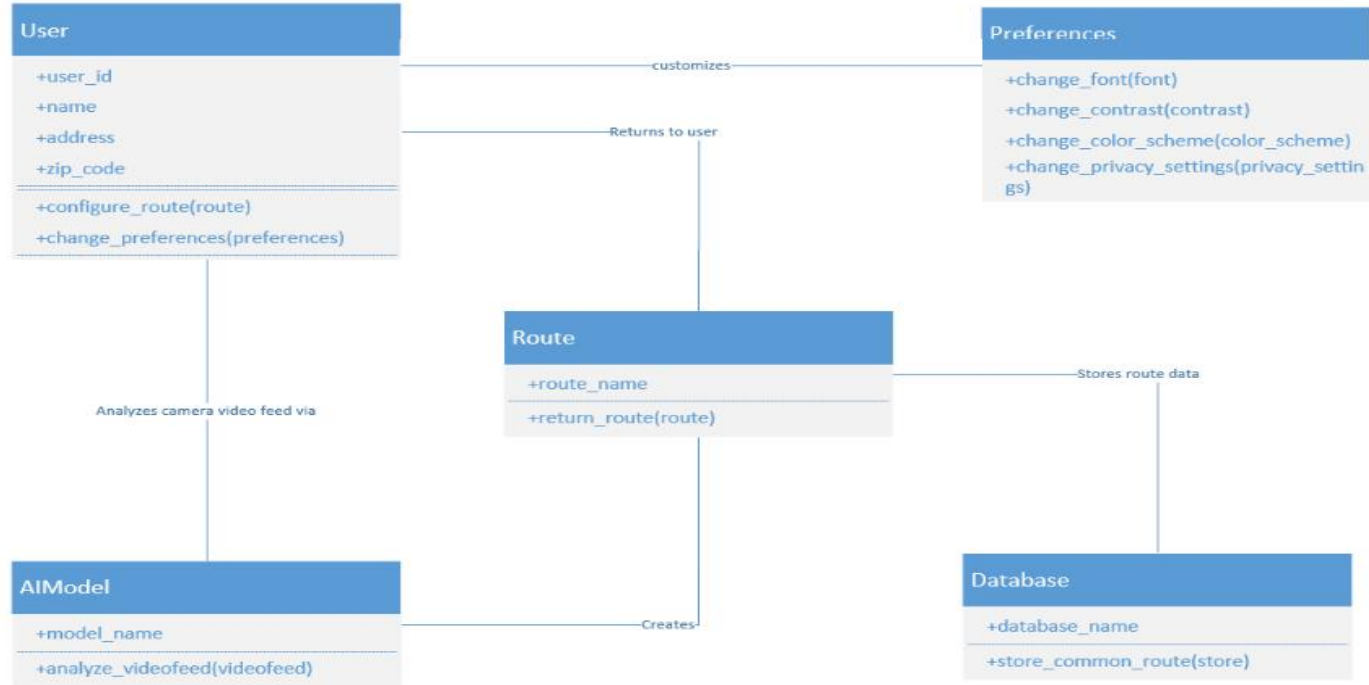


## State Diagram





## 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

▼

Backlog

(11 issues)

1

0

0

Create sprint

SCRUM-19

Architecture Diagram Review

TO DO

1

SCRUM-26

API (FastAPI, Google) Documentation

TO DO

-

SCRUM-2

Code Deployment on Server

TO DO

-

SCRUM-7

Troubleshooting and Recovery Functionality In Server

TO DO

-

SCRUM-6

Need to think of some kind of user identification/authentication/login model for Persona 2

TO DO

-

SCRUM-9

Interface to capture the image

TO DO

-

SCRUM-14

Post - MVP - 1. Voice Activated Feature 2. Data Consistency (How to alert database only critical necessity)

TO DO

-

SCRUM-16

Read documentation for links posted on WhatsApp

TO DO

-

SCRUM-20

Text-to-Speech API, Backend)

TO DO

-

SCRUM-22

Scrum Meeting 24 Feb 2024 9:00 PM (Sprint 1 Planning Video)

TO DO

-

SCRUM-24

Database overloading concerns

TO DO

-

+ Create issue

# Sprint 1 – Sprint Planning

The screenshot shows the Jira Sprint Planning interface for the 'GuideSense' project. The left sidebar contains navigation options: 'Your work', 'Recent', 'Starred', 'Apps', 'Plans', 'Projects', 'Recent' (with 'GuideSense' selected), 'Go to market sample', 'View all projects', 'Filters', 'Dashboards', 'Operations', 'Assets (PREVIEW)', 'Teams', and 'Customize sidebar'. The main area displays the 'Sprint 1' planning view, which includes a search bar, a 'Create' button, and a 'No users left' warning. The sprint details show 'Sprint 1' running from '11 Feb' to '10 Mar' with '11 Issues'. The tasks listed are:

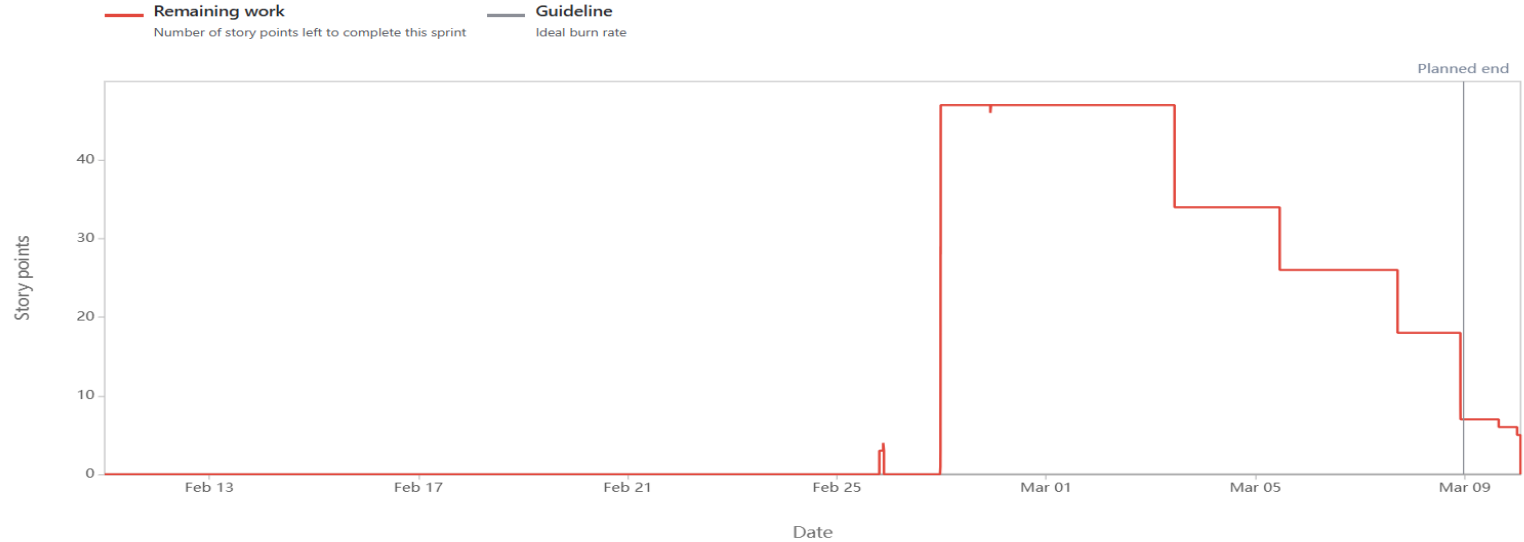
Task	Estimate	Assignee	Status
SCRUM-25: CLERK in UI?	10:00	Assignee	Not Started
SCRUM-1: Database Setup	10:00	Assignee	Not Started
SCRUM-8: GPS Integration	10:00	Assignee	Not Started
SCRUM-10: Architecture Diagram	10:00	Assignee	Not Started
SCRUM-5: Check where is server hostable for free (AWS/AWS)	10:00	Assignee	Not Started
SCRUM-3: Python API for Object Detection	10:00	Assignee	Not Started
SCRUM-11: Context Diagram	10:00	Assignee	Not Started
SCRUM-16: Deployment Diagram	10:00	Assignee	Not Started
SCRUM-12: ER Diagrams	10:00	Assignee	Not Started
SCRUM-21: Software Diagram	10:00	Assignee	Not Started
SCRUM-27: Test Case Story	10:00	Assignee	Not Started

Below the tasks, there is a 'Create issue' button and a section for 'Sprint 2' (11 Mar - 7 Apr) with 0 issues. A 'Quickstart' button is also visible.

## Sprint 1 – Burndown Chart

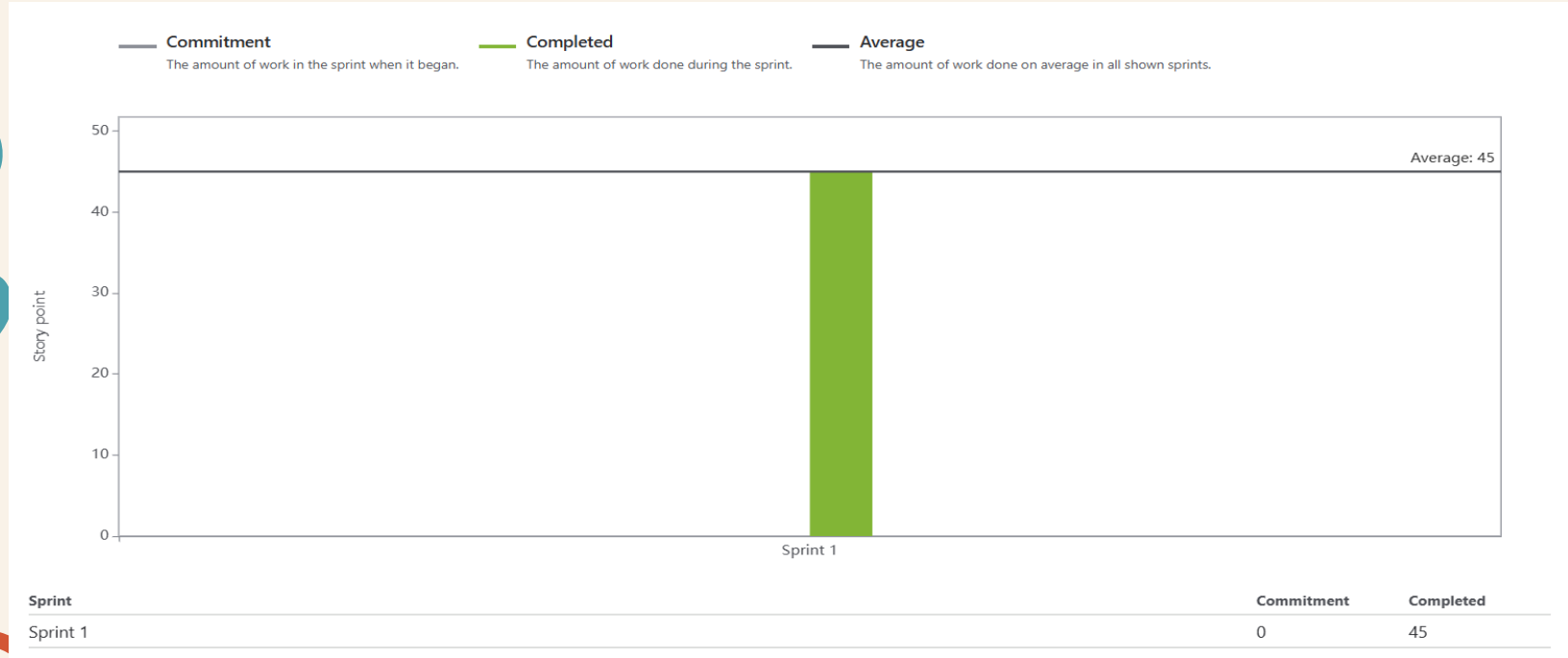
**Date** - February 11th, 2025 - March 8th, 2025

**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



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

# Retrospective – Sprint 0

## What went well?

Everyone was active on Whatsapp

Everyone collaborated in coming up with project ideas

Respected each other's opinions

Team coordination was good

## What need to improve

Calls frequency and participation

Need to document what everyone is doing

Everyone needs to speak during the meeting.

## Action Items

Schedule a zoom call and add it in our calendar

Setup Jira for Project management.

Start early for sprint 1

# Retrospective – Sprint 1

## Sprint 1

### What went well? +

We are able to complete the MVP

+ 0

Task allocation went well. We prioritized all the tickets well

+ 0

Standup frequency has been increased

+ 0

Everyone is contributing / collaborating well

+ 0

We were able to complete almost every task we scheduled for this sprint.

+ 0

### What needs to be improved? +

Jira updates needs to be regular

+ 0

Lack of advance communication regarding meeting attendance

+ 0

Scheduling Conflict

+ 0

Sprint planning needs to be at the beginning of the sprint

+ 0

Ensure PRs are reviewed

+ 0

### Action Items +

Sprint planning meeting needs to be scheduled

+ 0

We need to inform on the group earlier in case you are missing the meeting, so that we can reschedule it.

+ 0

make sure whenever you do something, you post it on the Jira ticket, and make sure that ticket is in the correct status.

+ 0

Everyone needs to be aware of their schedule and communicate the same to the team on Tuesday before/after the class.

+ 0

Make sure you are reviewing the code when you get notified through the email

+ 0



## Sprint 2 – Sprint Planning

☐ **Sprint 2** 11 Mar – 8 Apr (9 issues)

3900Start sprint...


Combine both codes

<input checked="" type="checkbox"/> SCRUM-54 Connect the FastAPI to Node.js	TO DO ▾	5	YT
<input checked="" type="checkbox"/> SCRUM-20 Text-to-Speech API, Backend	TO DO ▾	8	RM
<input checked="" type="checkbox"/> SCRUM-50 Login UI design	TO DO ▾	3	KC
<input checked="" type="checkbox"/> SCRUM-51 Make connection between users	TO DO ▾	5	KC
<input checked="" type="checkbox"/> SCRUM-22 Scrum Meeting 24 Feb 2024 9:00 PM (Sprint 1 Planning Video)	TO DO ▾	1	MT
<input checked="" type="checkbox"/> SCRUM-26 API (FastAPI, Google) Documentation	TO DO ▾	8	MT
<input checked="" type="checkbox"/> SCRUM-19 Architecture Diagram Review	TO DO ▾	1	DS
<input checked="" type="checkbox"/> SCRUM-9 Interface to capture the image	TO DO ▾	8	HS
<input checked="" type="checkbox"/> SCRUM-55 Test Case Story	TO DO ▾	-	DS

+ Create issue

9 issues | Estimate: 39

# Sprint 1 – Project Demo



## Sign in to GuideSense

Welcome back! Please sign in to continue

Continue with Google


or

Email address or username


Enter email or username

Continue ▶

Don't have an account? Sign up

Secured by  clerk

Development mode



## Create your account

Welcome! Please fill in the details to get started.

Continue with Google


or

Username

Email address


Enter your email address

Password

Enter your password 

Continue ▶

Already have an account? Sign in

Secured by  clerk

Development mode

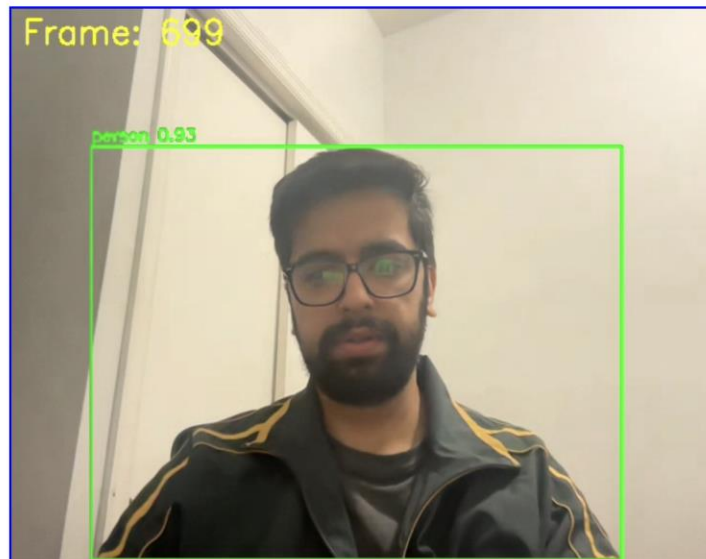
# Sprint 1 – Project Demo

## YOLO Detection

Local Stream

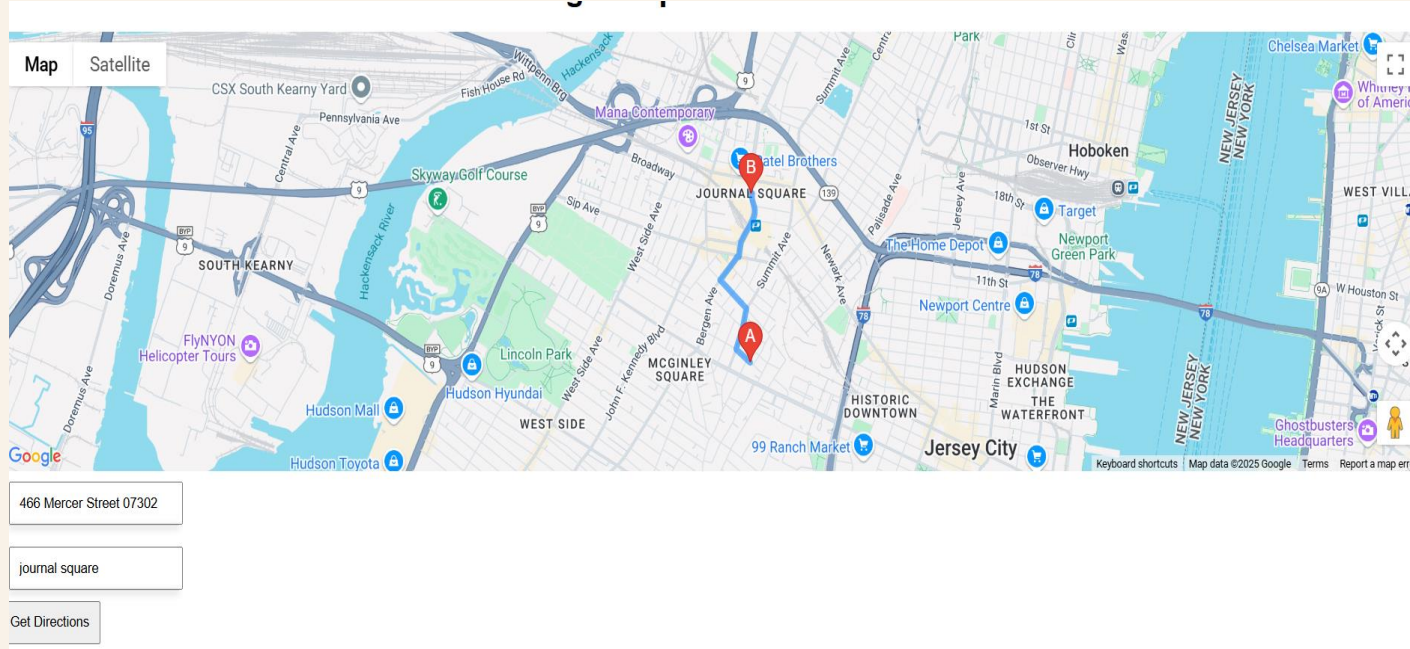


Remote Stream (From Server)



Status: Connection successful


# Sprint 1 – Project Demo





Project Wikipage Link

<https://github.com/htmhw/2025S-Power-Anger/wiki>





## Live Application Demo

