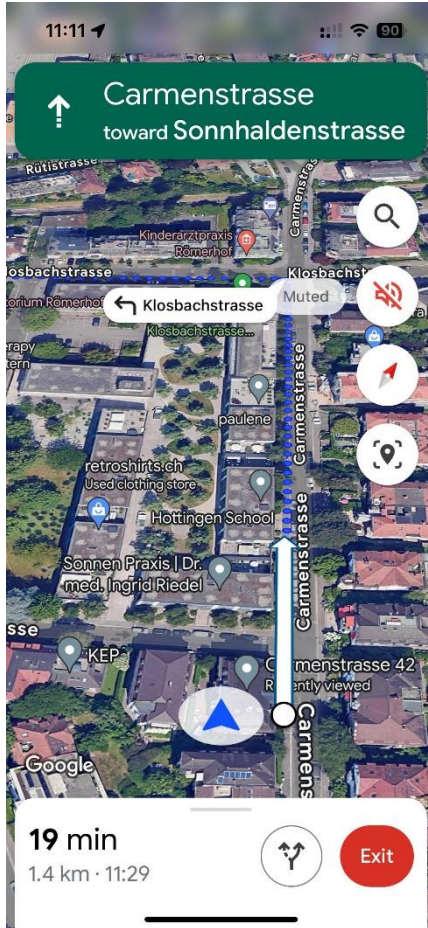## Factors Influencing Map Checking In Pedestrian Navigation and Checking Points Prediction

- Motivation

- Research Questions

- Hypotheses

- Data

- Expected outcomes and anticipated challenges

- Brief timeline and planned milestones

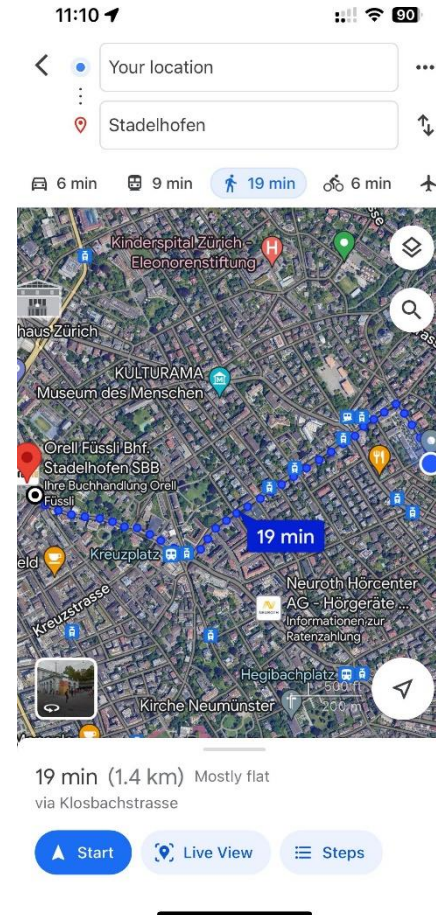- Things that need to be determined

Motivation :

Directions may not be accurate during walking navigation

Navigation is too detailed to overlook all the information

Decrease spatial cognition

Unable to provide any proactive prompts

Unnecessary checks during navigation

If we could learn when and where are the most likely checking points during walking navigation, walking navigation prompts can be improved.

Research Questions:

1. What are the main factors which influence when and where the pedestrians check the mobile map during walking navigation?

2. What is the difference of factors that affect checking map in walking navigation between high and low traffic density?

3. What are the results of using artificial intelligence algorithms to predict map-checking points in pedestrian navigation? (Talked this with people majoring in AI and Data Science. Theoretically feasible)

- **Hypothesis:**

- What are the main factors which influence when and where the pedestrians check the mobile map during walking navigation?
- *Distance to intersections/ Distance from start point/ Time from start point/ Spatial cognitive confidence/ ……*

- What is the difference of factors that affect viewing maps in walking navigation between high and low traffic density?
- *There may be new influencing factors emerging, and the weights of each factor may different*

- What are the results of using artificial intelligence algorithms to predict map-checking points in pedestrian navigation?
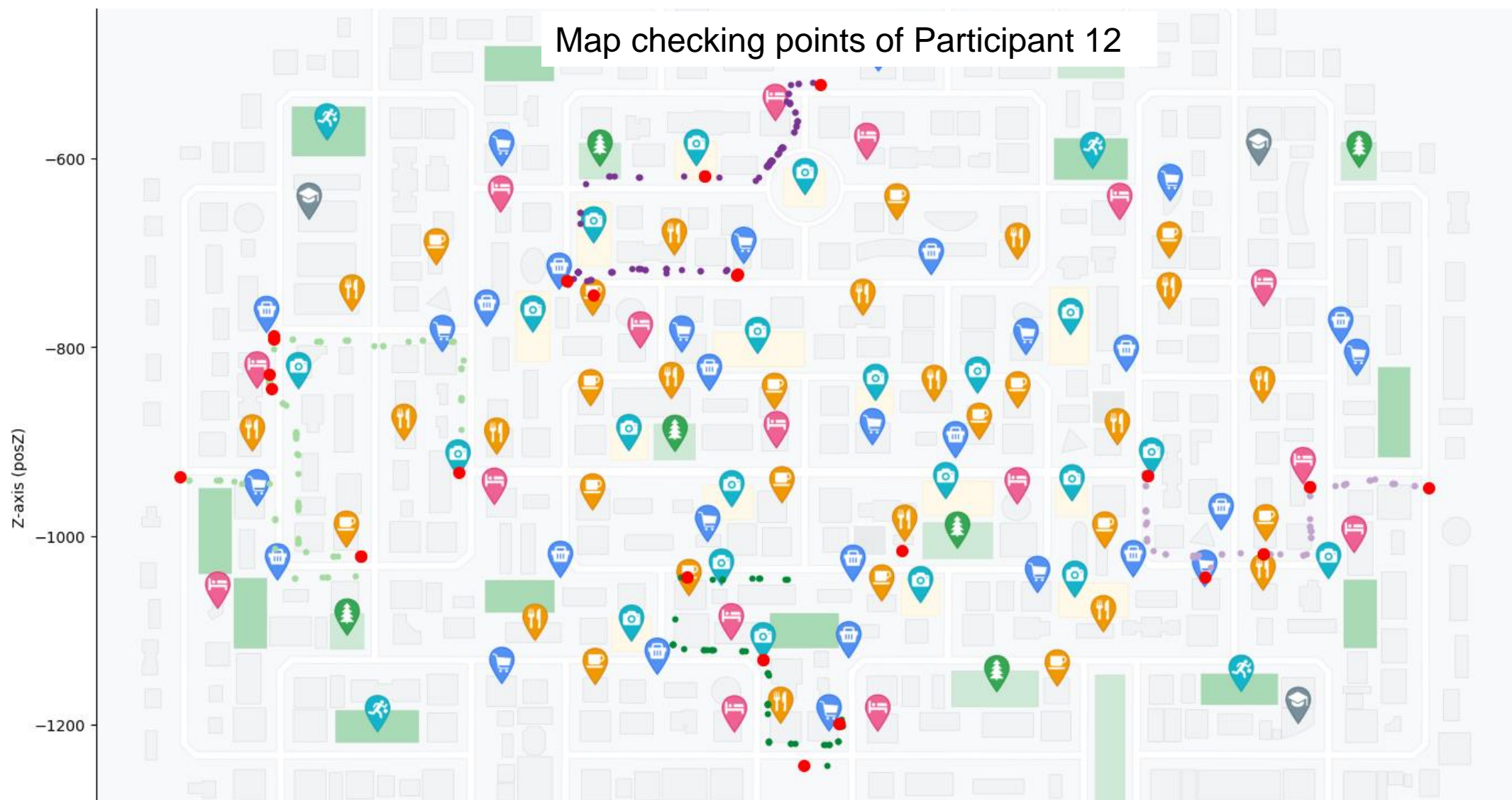
Data:

Trajectory of Participant 12

Data:

Map checking points of Participant 12
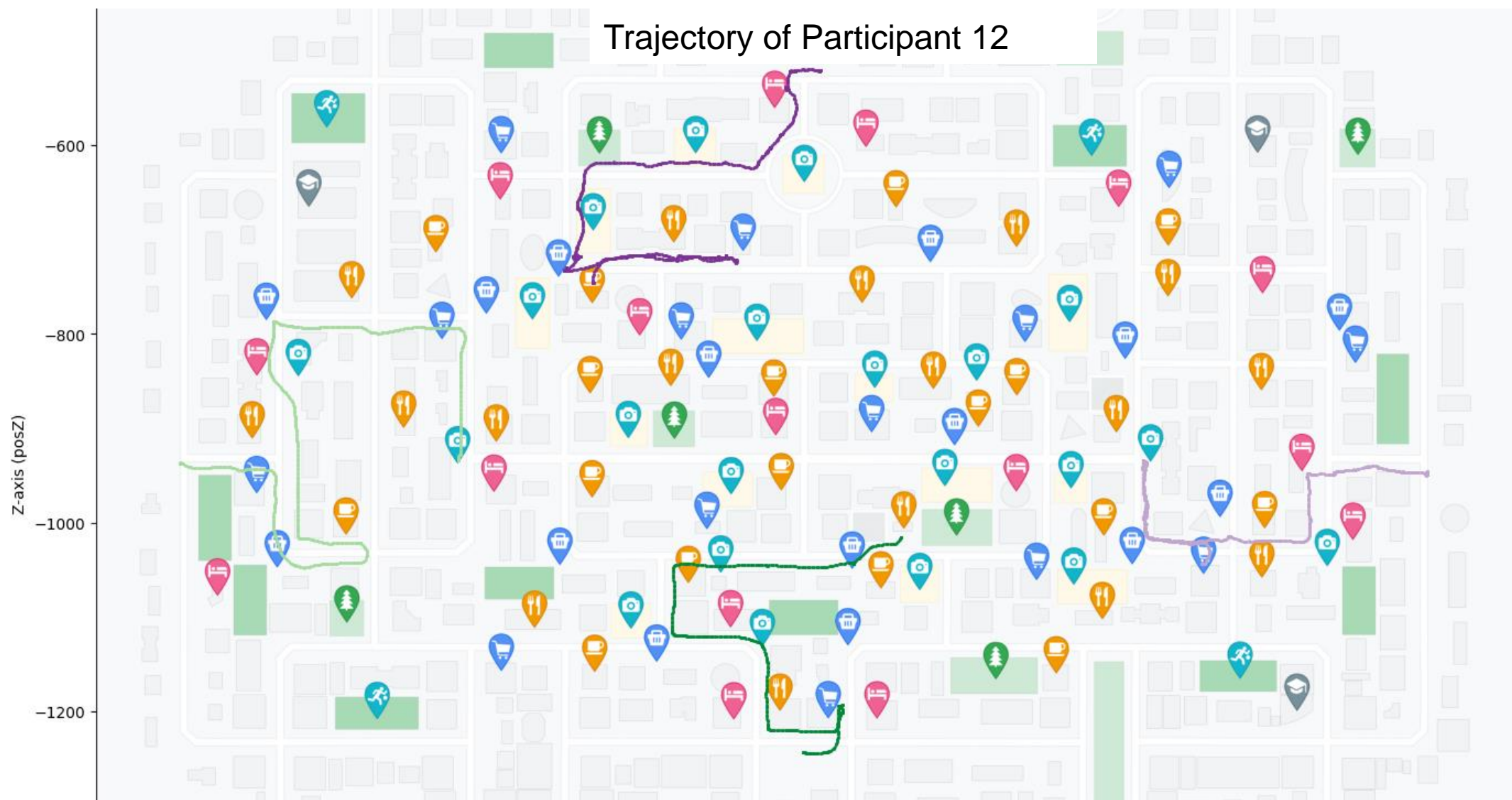
- Current progress

Data:

```
DateTime;posX;posY;posZ;rotX;rotY;rotZ;taskState;mapInteractions
2023-09-21 16:20:19.695;-600.7;1.304999;-1242.5;0;5.627255;0;;
2023-09-21 16:20:20.192;-600.7;1.304999;-1242.5;0;5.627255;0;;
2023-09-21 16:20:20.745;-600.6932;1.304999;-1242.428;0;5.627255;0;;
2023-09-21 16:20:21.248;-600.6771;1.304999;-1242.266;0;5.627255;0;;
2023-09-21 16:20:21.761;-600.6771;1.304999;-1242.266;0;5.627255;0;;
2023-09-21 16:20:22.261;-600.6379;1.304999;-1241.868;0;5.627255;0;;
2023-09-21 16:20:22.762;-600.5758;1.304999;-1241.24;0;5.627255;0;;
2023-09-21 16:20:23.265;-600.57;1.304999;-1241.182;0;5.627255;0;;
2023-09-21 16:20:23.769;-600.5285;1.304999;-1240.763;0;5.627255;0;;
2023-09-21 16:20:24.279;-600.5281;1.304999;-1240.759;0;5.627255;0;;
2023-09-21 16:20:24.792;-600.5241;1.304999;-1240.717;0;5.627255;0;;
2023-09-21 16:20:24.903;-600.5068;1.304999;-1240.54;0;5.627255;0;;mapLog:isScreenLocked+False
2023-09-21 16:20:24.960;-600.4944;1.304999;-1240.414;0;5.627255;0;;mapLog:positionXYZ+-560.3516+100+-862.916
```

Data Structure: *Time; Position; Rotation; Taskstate; Mapinterations*

- **Expected outcomes**

  - *Summary of influence factors and validation*
  - *Difference results between high and low traffic density*
  - *Results from AI algorithm predicting checking points*

- **Anticipated challenges**

  - *AI-related technical support*
  - *Data volume for AI training*
  - *Time Limitation*

Brief timeline and planned milestone :

Milestones	Deadline
Comprehensive/systematic literature review	04.03.2024
Determine Specific Methods and Algorithm	18.03.2024
Research Question 1	15.04.2024
Research Question 2	06.05.2024
Research Question 3	30.06.2024
Paper writing	19.08.2024
Paper review and revision	23.09.2024
Final submission	30.09.2024

Things that need to be determined:

- Supervisor (Sara, Mona, Would Mona like to be the co-supervisor? How to differentiate guidance distribution?)

- Concept uploaded to lean gate (Finish it after meeting, whether this needs to be reviewed?)

- Approximate length of the Master's Thesis (Not mandatory, default 80 pages)

- Potential Journals and Conferences (What are some potential journals or conferences that may publish this project?)