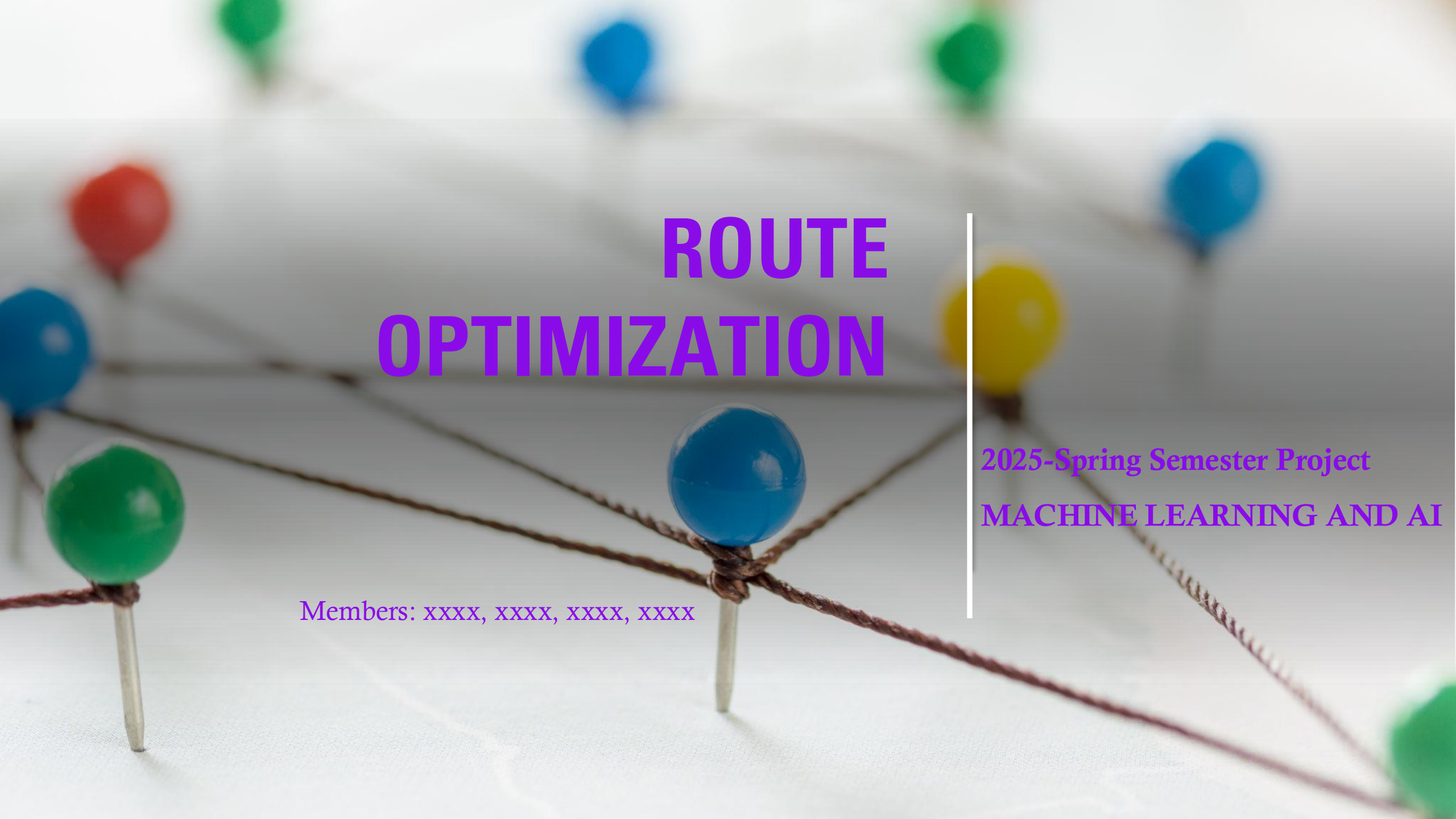


ROUTE OPTIMIZATION

2025-Spring Semester Project

MACHINE LEARNING AND AI

Members: xxxx, xxxx, xxxx, xxxx

INTRODUCTION

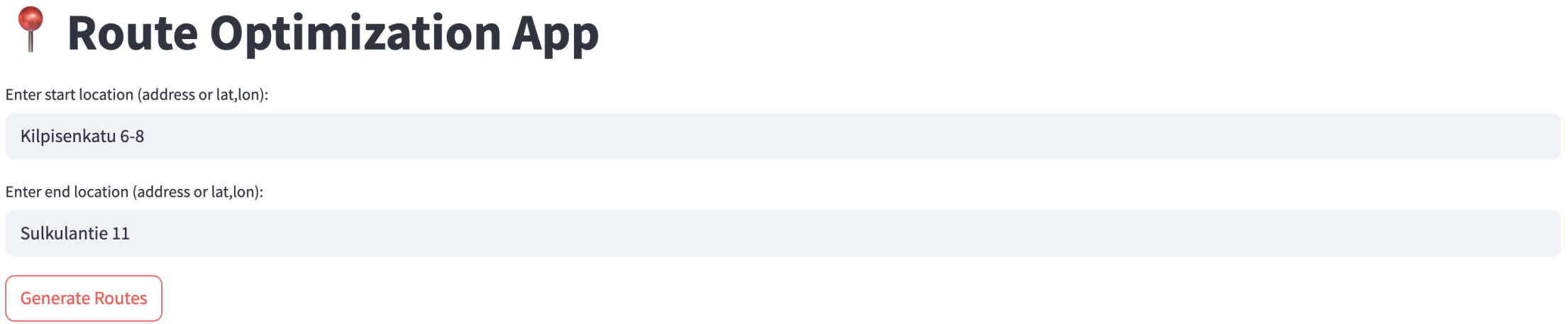
- Objective:
  - Use Machine Learning (ML) and Artificial Inteligent (AI) algorithms to optimize a route from Jyväskylä area
  - Use weather, image, traffic data in the optimization logic
  - Marjetas OY is the partnering company in the project and shares related data along with API credentials for the optimization purpose
  - Generate a solution within your project team and be prepared for exhibition day

FOLLOWING APPROACHES APPLIED

1. Random traffic, friction weights distributed on the map edges (roads)
   - Default short distance travel time and length are calculated
   - Alternative paths are visualized on the graph

2. Second Approach: Use random friction on the map(nodes)
   - Get 3 routes for each start and end location on the map
   - The 3 routes are Absolute Fastest Route, Most Optimal (Distance), Longest Route.
   - The Absolute Fastest is the best route to take taking into accounts all road and weather conditions
   - The Most Optimal (Distance) is the route with the shortest distance.
   - The Longest Route is considered as the longest path between the start and end location.

EXAMPLES OF THE SECOND APPROACH



EXPLANATION

- The applications accepts both address and co-ordinates as start and end locations.
- In the example above I used start location as Kilpisenkatu 6-8 and the end location as Sulkulantie 11.
- Then the result below displays the 3 routes with their appropriate distance, time and label.
- The random colors on the map is representing the friction values of each node on the map.

EXPLANATION CONTD.