NANYANG TECHNOLOGICAL UNIVERSITY
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Dispatching Multiple Robots in an Urban Environment

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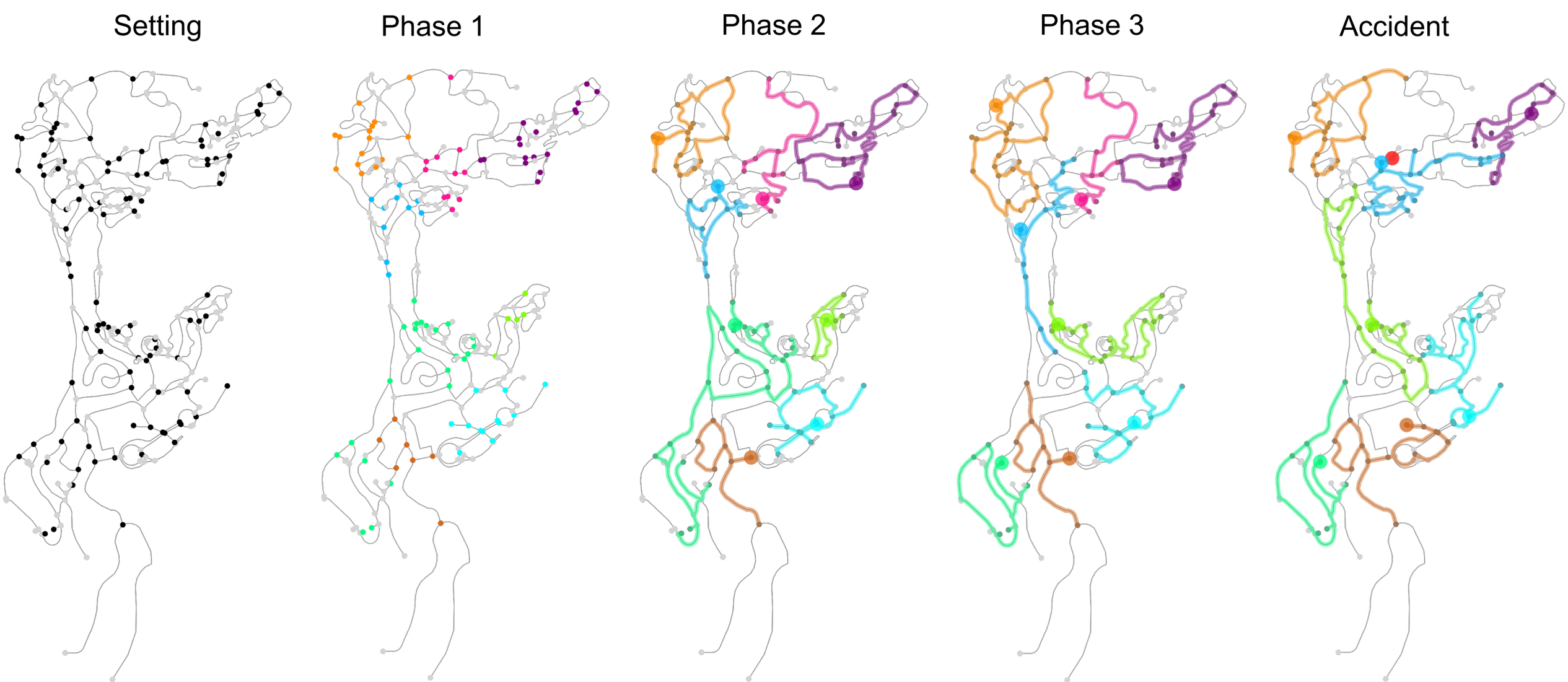
Project Objectives:

This project aims to design a strategy to dispatch multiple robots for patrolling in urban environment including approaches for distributing the patrol area among the robots, planning local optimal patrolling routes, and handling an accident site.

Botanic Gardens (N=100, K=8)



Setting	Randomly **select N points of interest** from nodes in the graph
Phase 1	**Group nearby pois** into K non-overlapping clusters using K-Means Clustering, where K is the number of robots
Phase 2	**Plan a route** for each cluster using Dijkstra and Greedy algorithm
Phase 3	**Refine clusters** to minimize the maximum route distance by assigning poi from longer routes to shorter routes.
Accident	Assign the nearest robot to the accident site. Generate K-1 new routes using Phase 1-3. **Map robots to new clusters** while minimizing the shift in clusters using Linear Programming