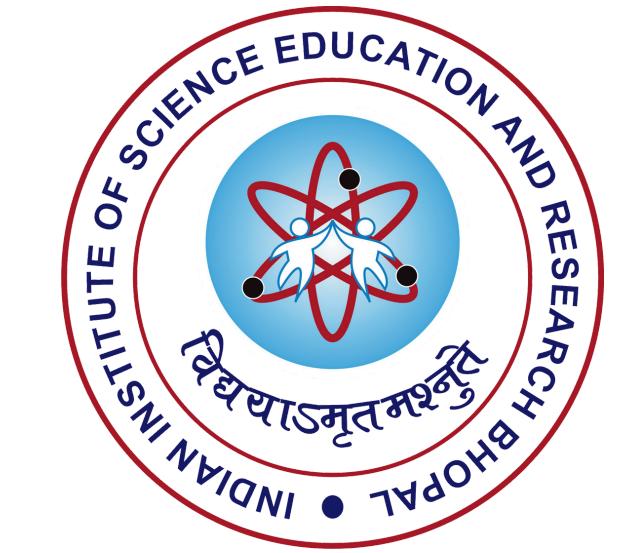
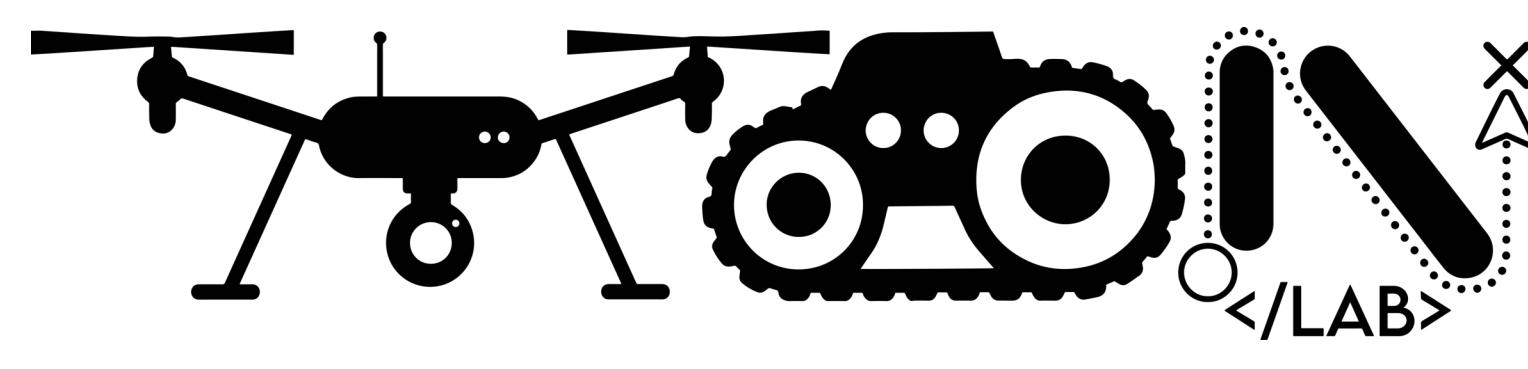
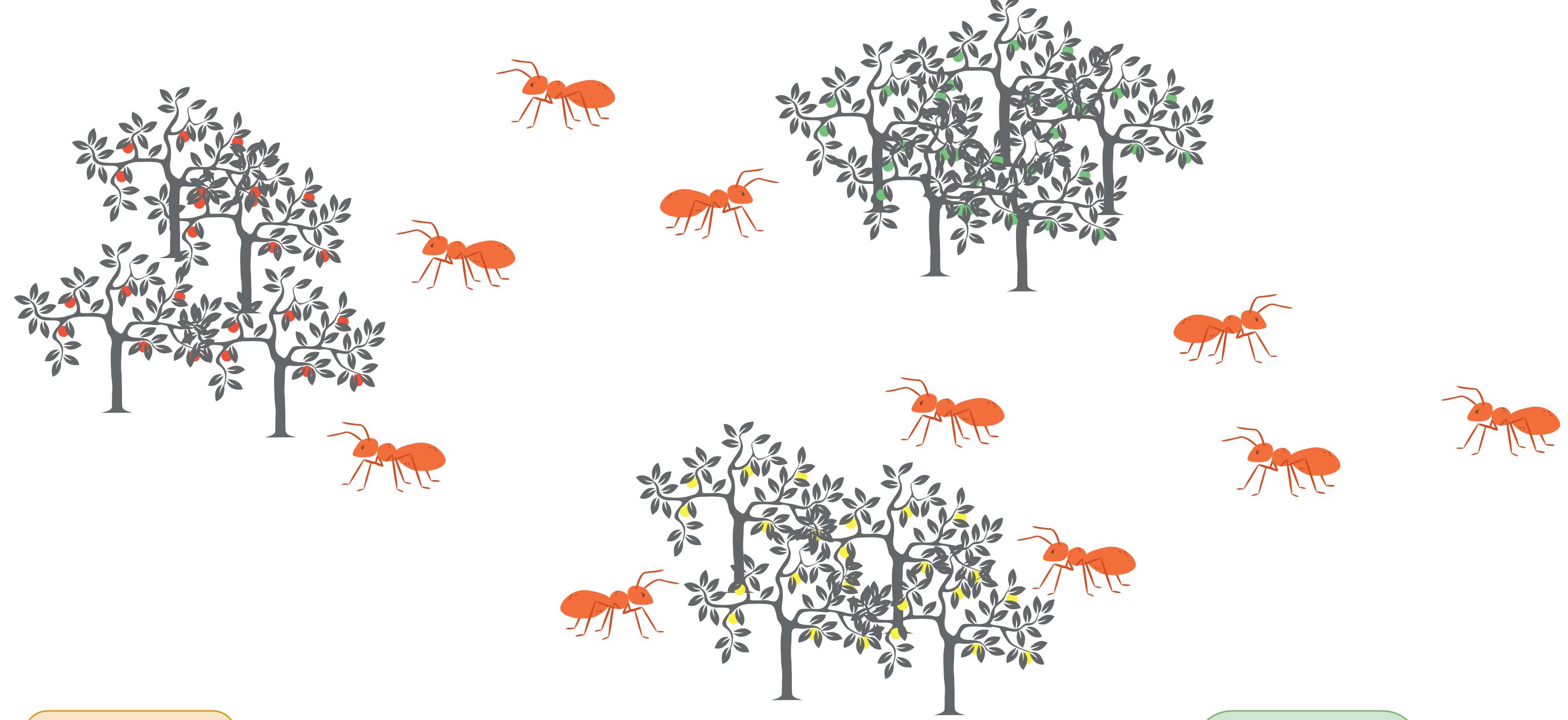


Moving Depot (MOD): An Efficient Depot Motion Strategy for Multi-Robot Foraging

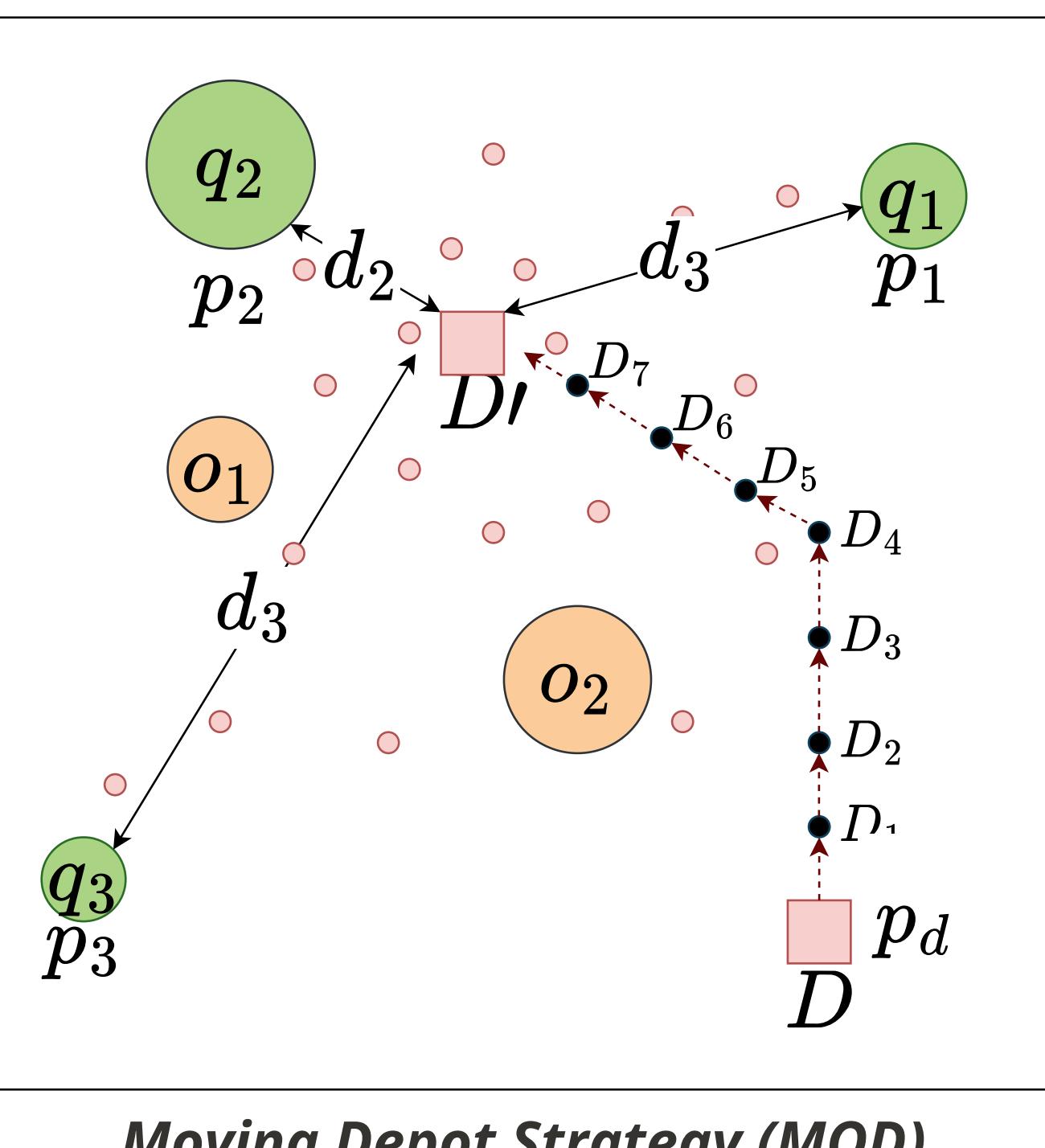
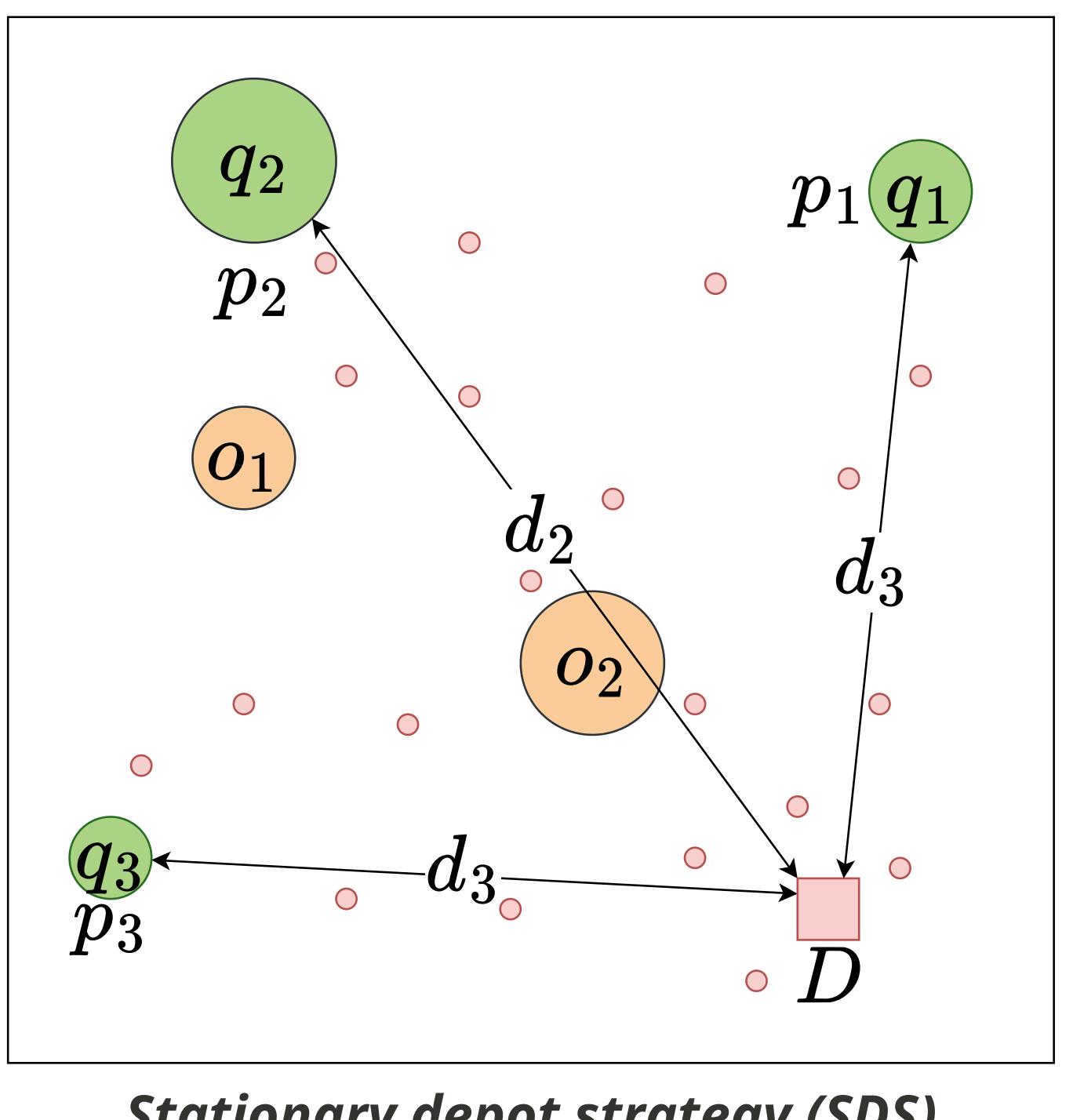
Pratik Ingle, Ananya Gandhi, and P.B. Sujit
 IT University of Copenhagen
 Indian Institute of Science Education and Research, Bhopal



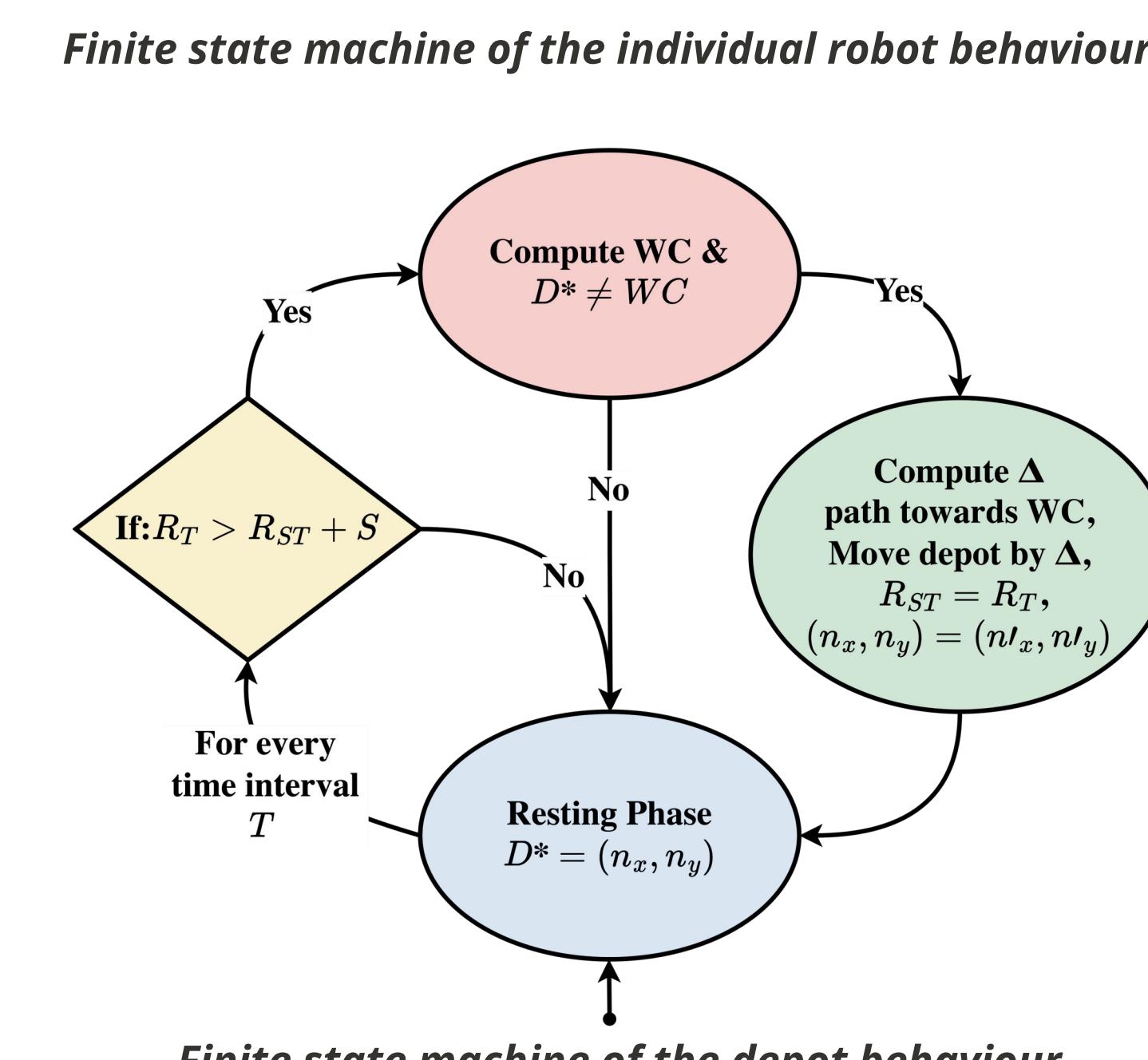
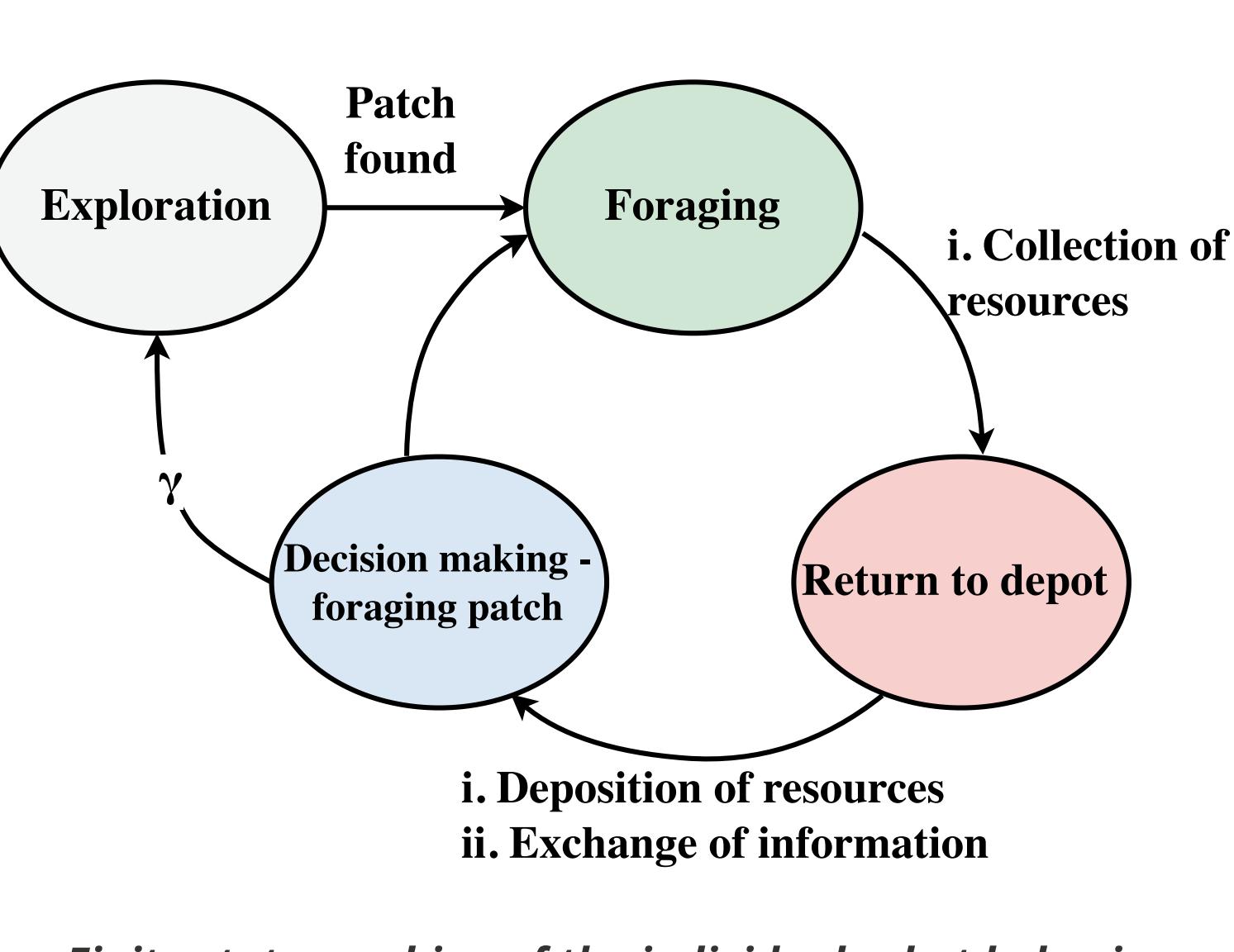
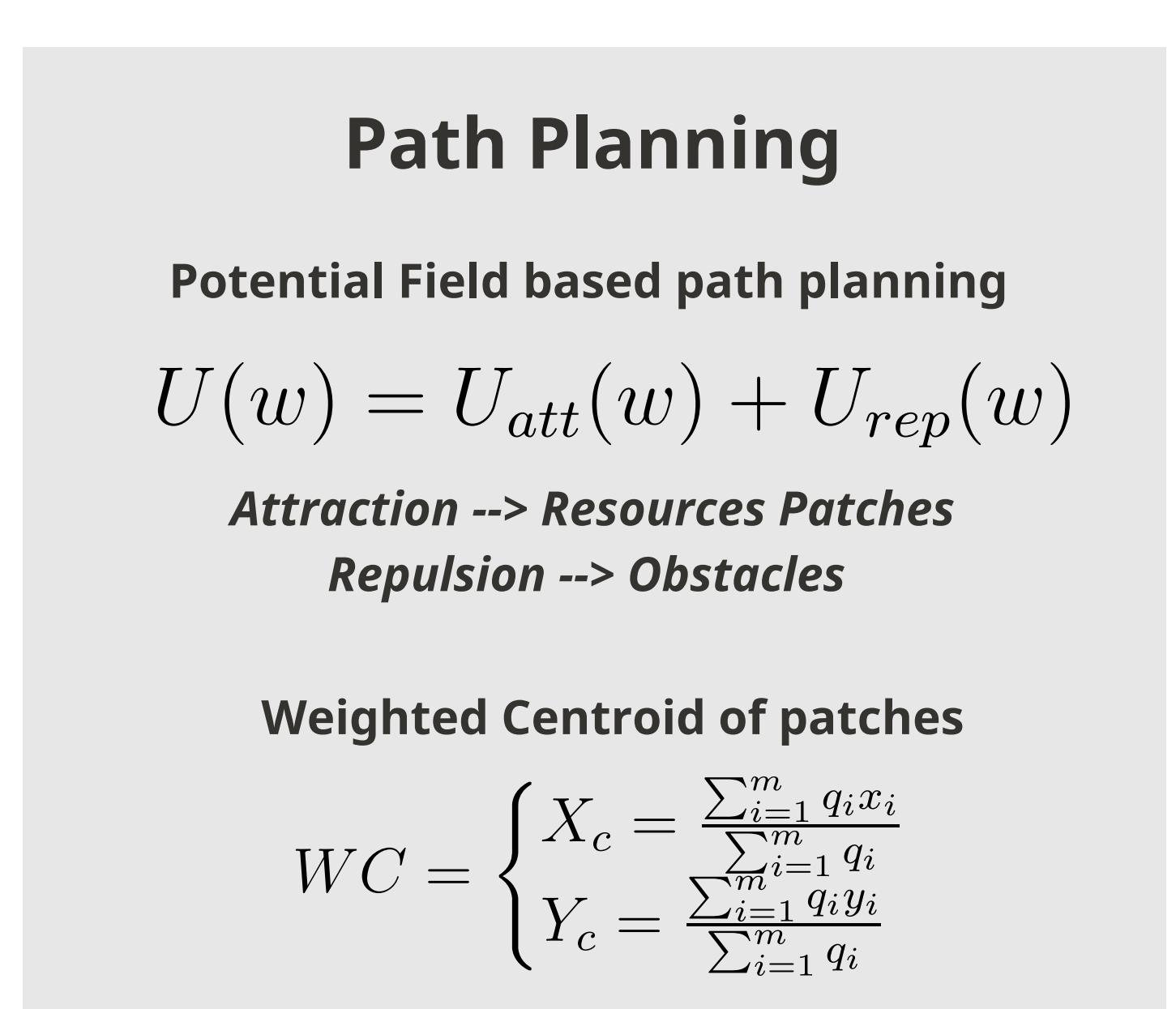
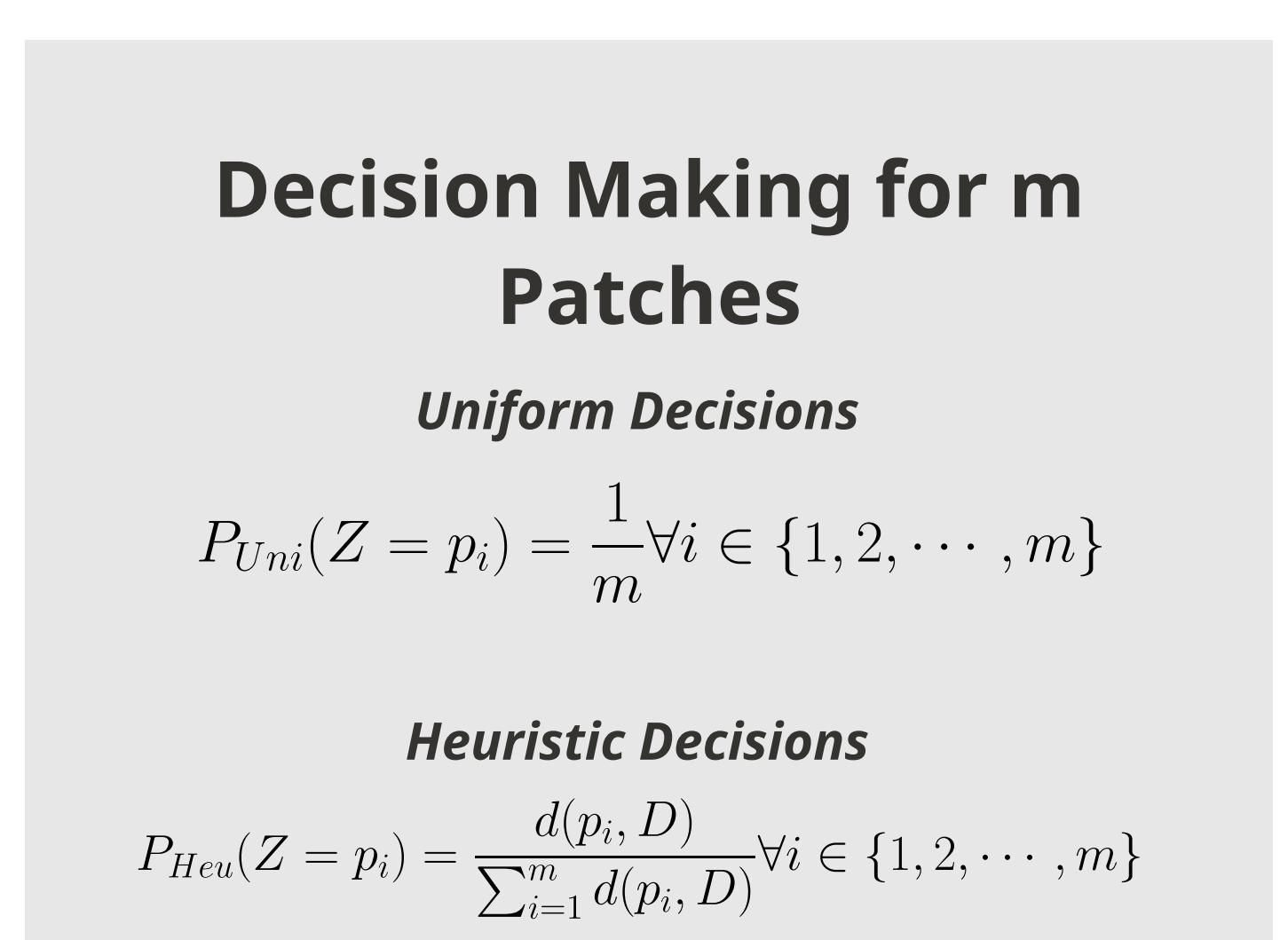
IT UNIVERSITY OF CPH



03. Methodology



The environment consists of patches (p) with varying resource quality (q), along with obstacles (O) and an initial depot position (D).



01. Introduction

In dynamic environments where foraging qualities and obstacles change, the effectiveness of a multi-robot system using a stationary depot strategy (SDS) may be limited. The primary focus of SDS is on the decision-making aspect of agents to improve foraging performance. However, can we enhance decision-making efficiency further? Is there an alternative approach? Yes, there is, and it's called the Moving Depot Strategy (MOD) algorithm. MOD incorporates a weighted centroid of foraging patches, their quality, and a potential field-based method to dynamically adjust the depot location while simultaneously avoiding obstacles.

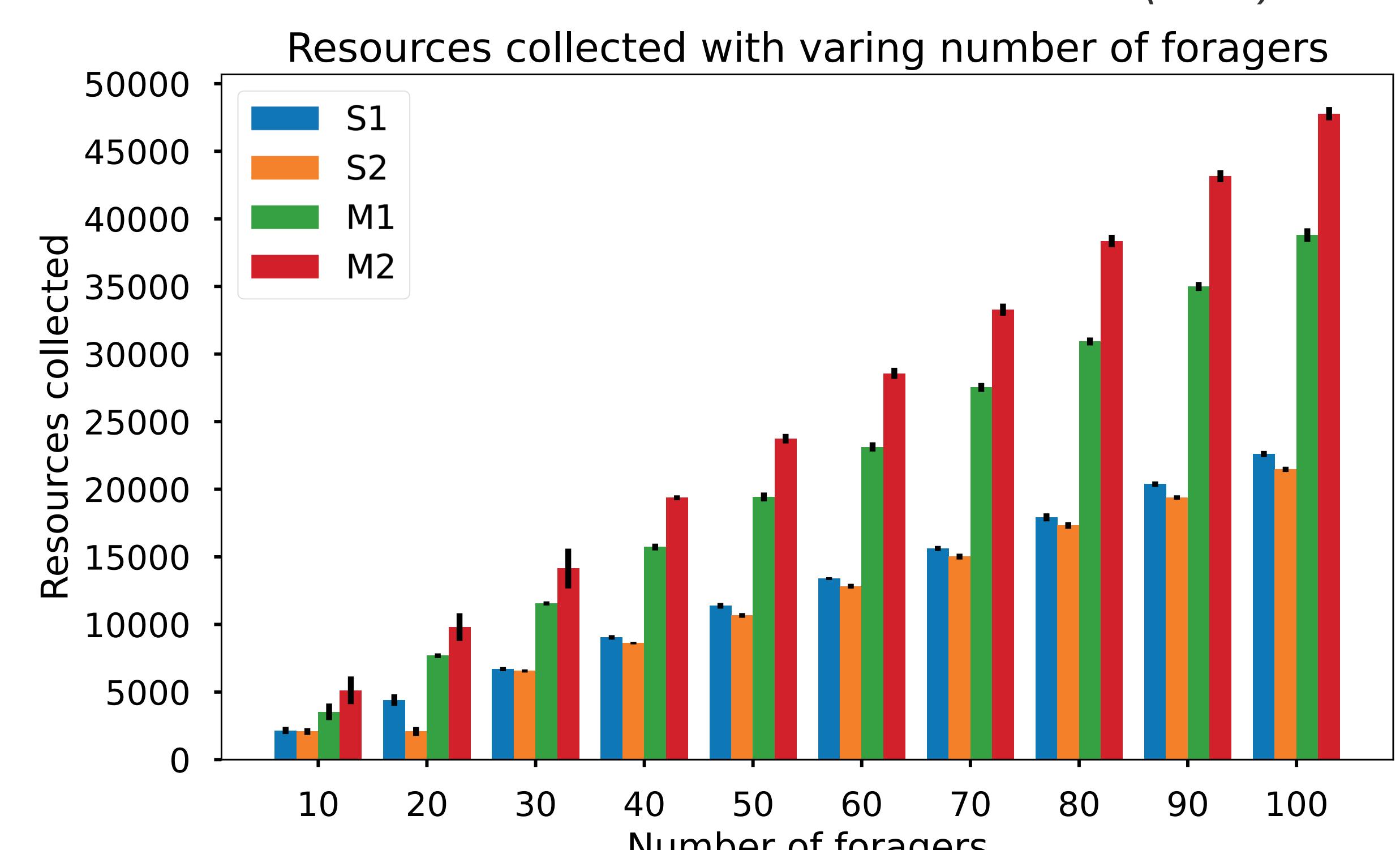
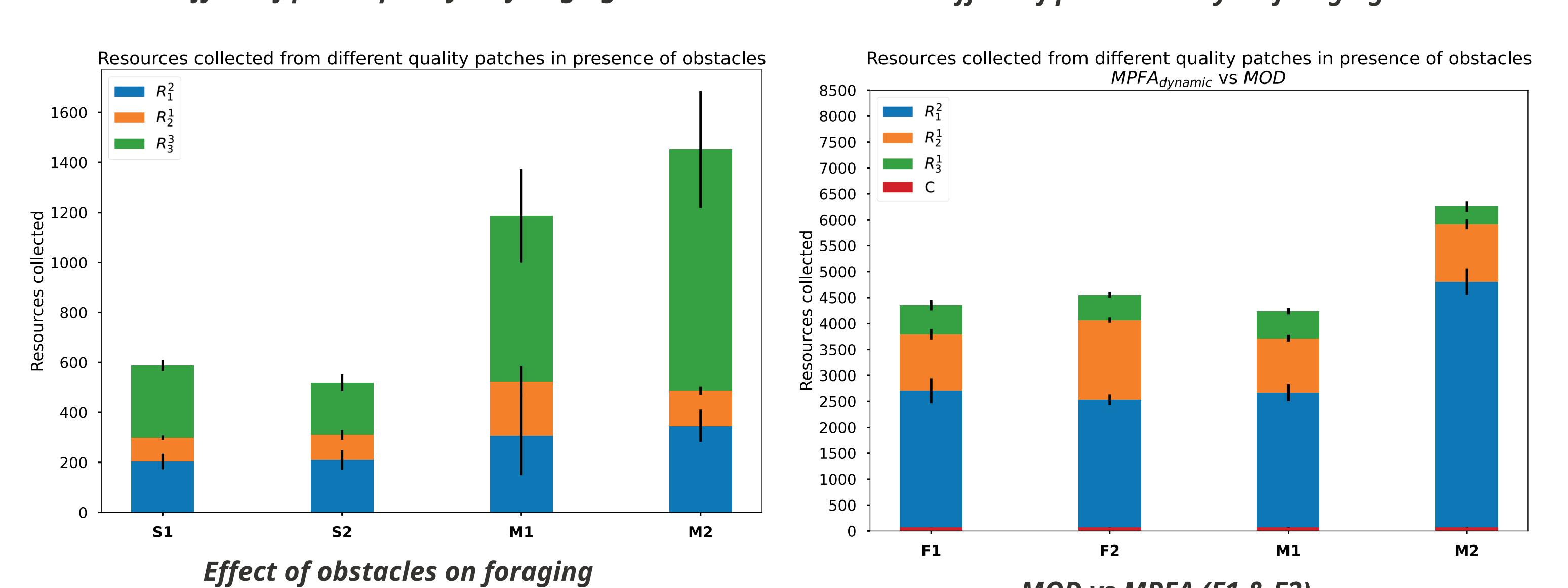
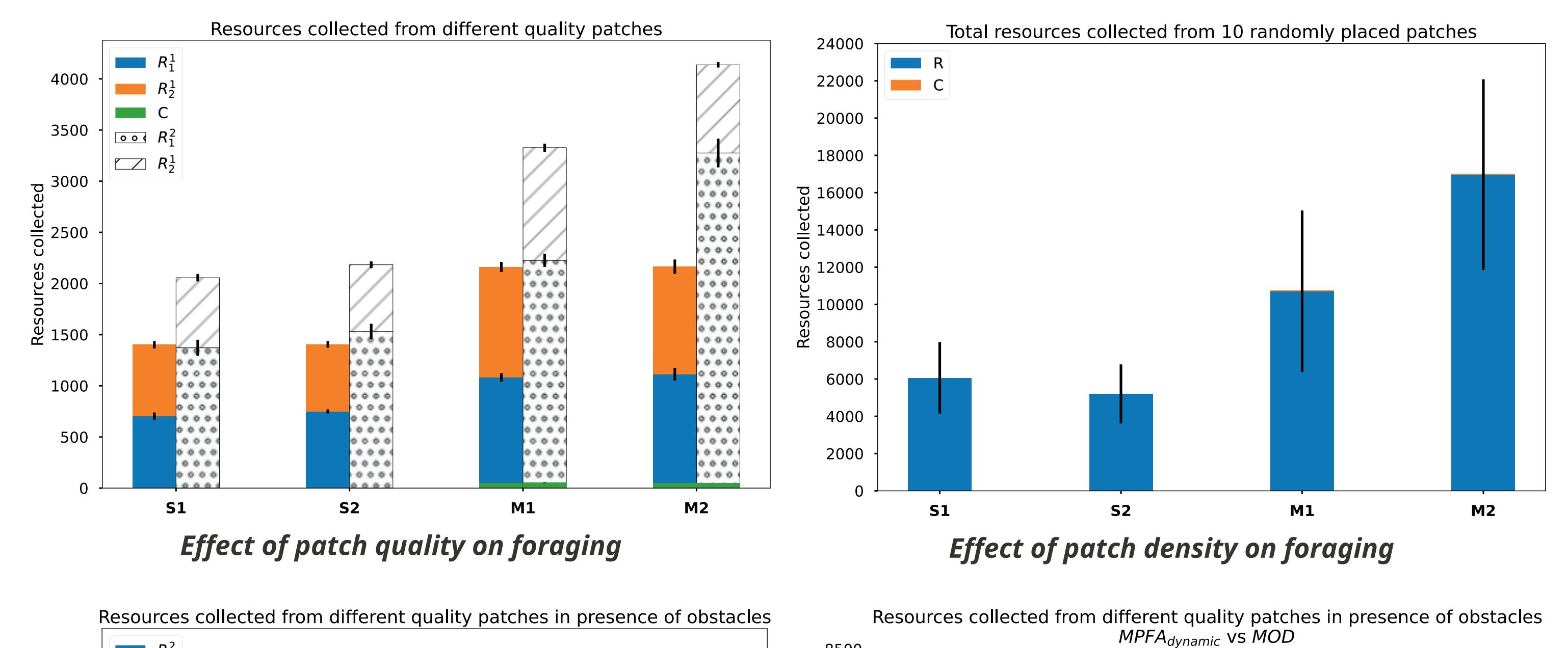
02. Objective

- Improve foraging performance
- Work in an unknown dynamic environment
- Maximize Gain/Cost ratio
- Avoid obstacles

03. Contributions

- Obstacle avoidance while 50% improvement in foraging performance
- Reduction of cost of motion
- Highly suitable for a dynamic environment

04. Results



Effect of change in the number of foragers

06. Conclusion & Future Work

- MOD is a practical, decentralized search-and-collection algorithm for ant-like robot swarms.
- Replace potential path planning with Multi-robot RL planning.