



Navigation among movable obstacles using machine learning based total time cost optimization

Kai ZHANG^{1,2}, Eric LUCET¹, Julien ALEXANDRE DIT SANDRETTO², David FILLIAT²

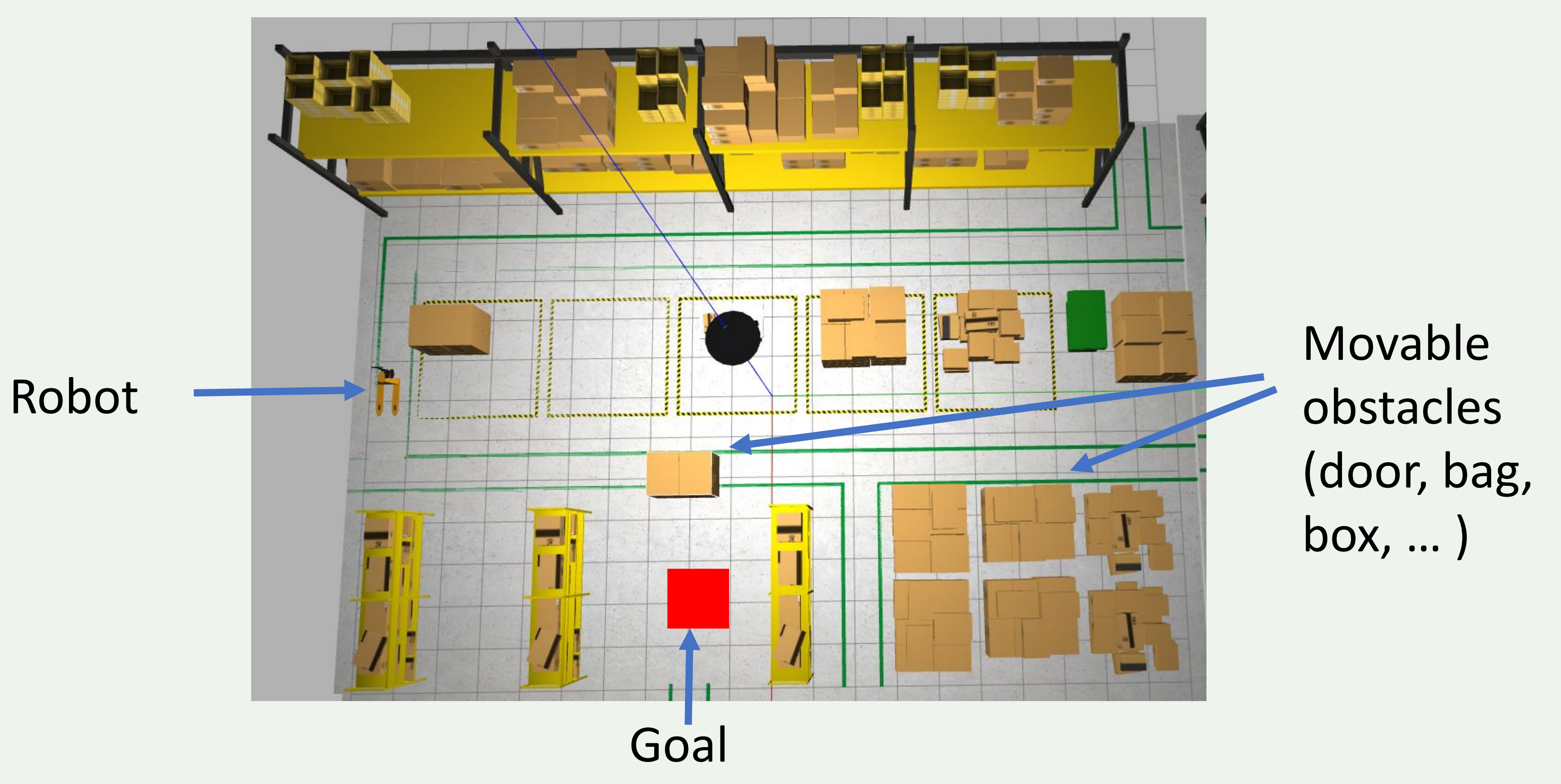
1. List, CEA, Université Paris-Saclay, Palaiseau, France
2. U2IS, ENSTA Paris, IP Paris, Palaiseau, France

kai.zhang@cea.fr

Introduction

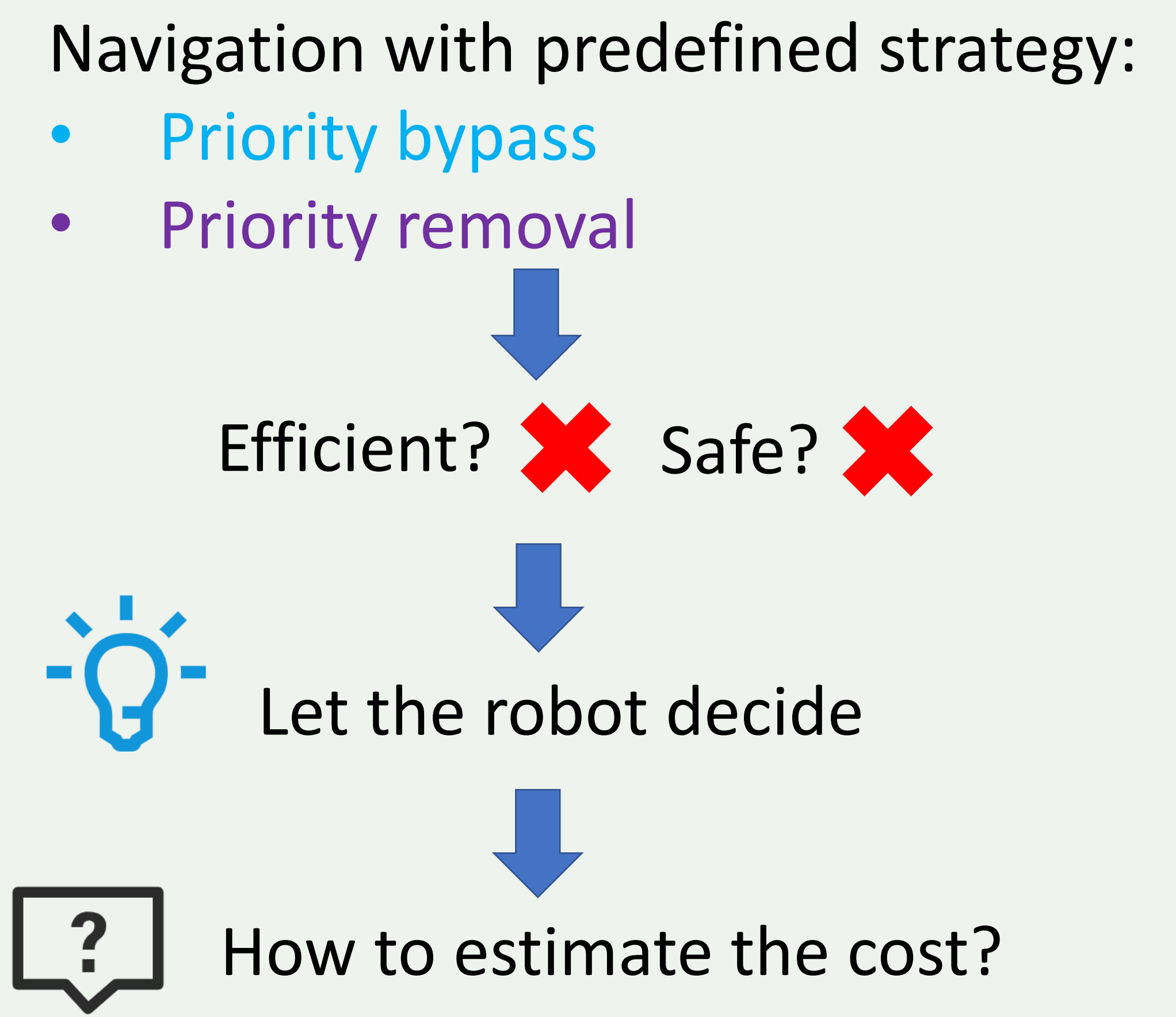
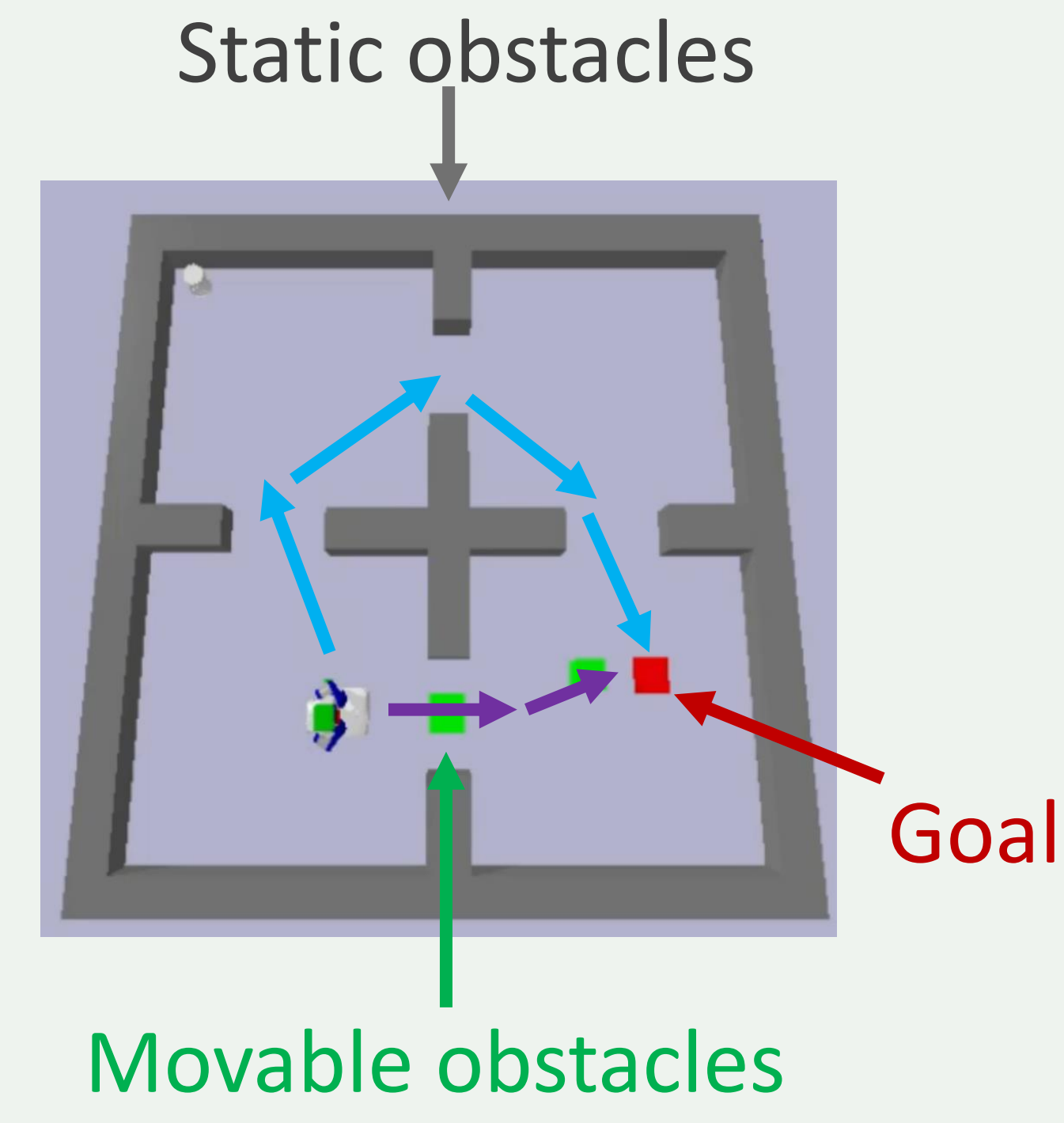
Navigation Among Movable Obstacles (NAMO)

- Navigation task
- Obstacle avoidance
- Interaction with movable obstacles

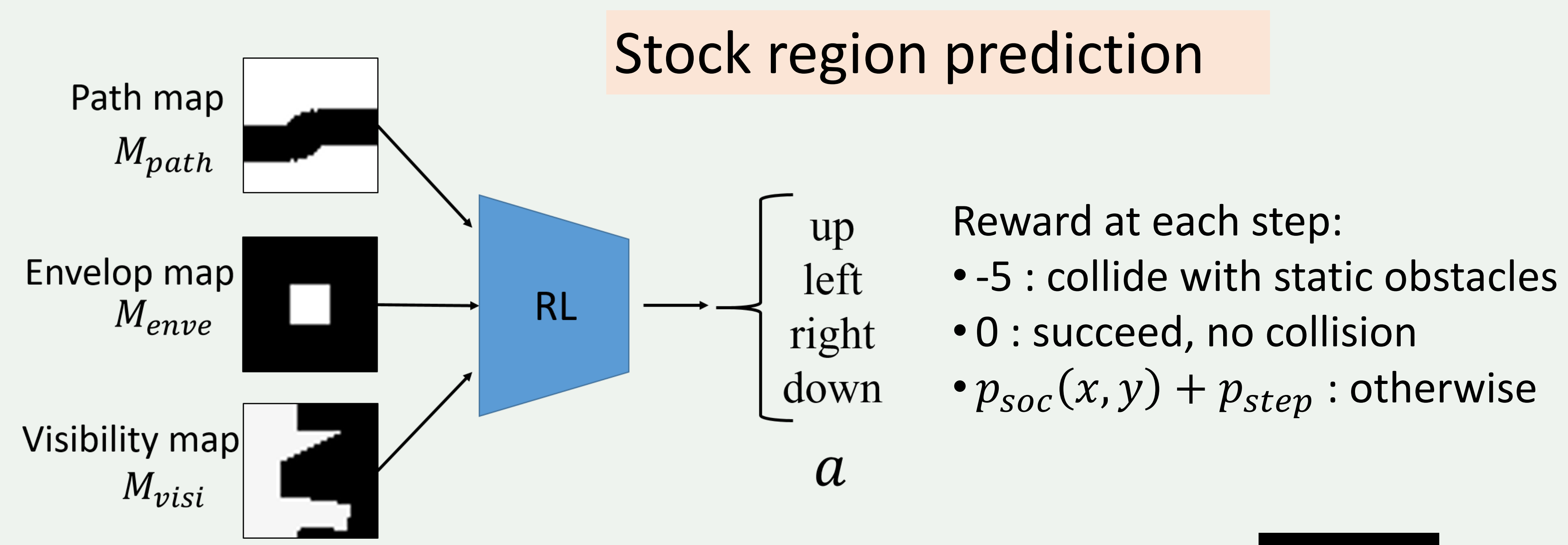
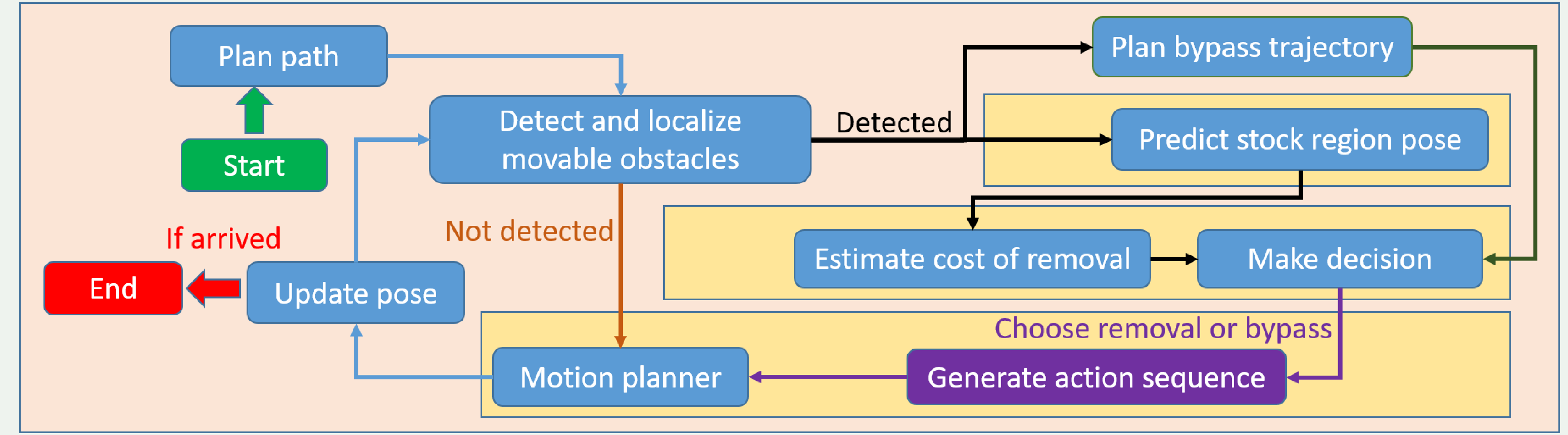


Motivation

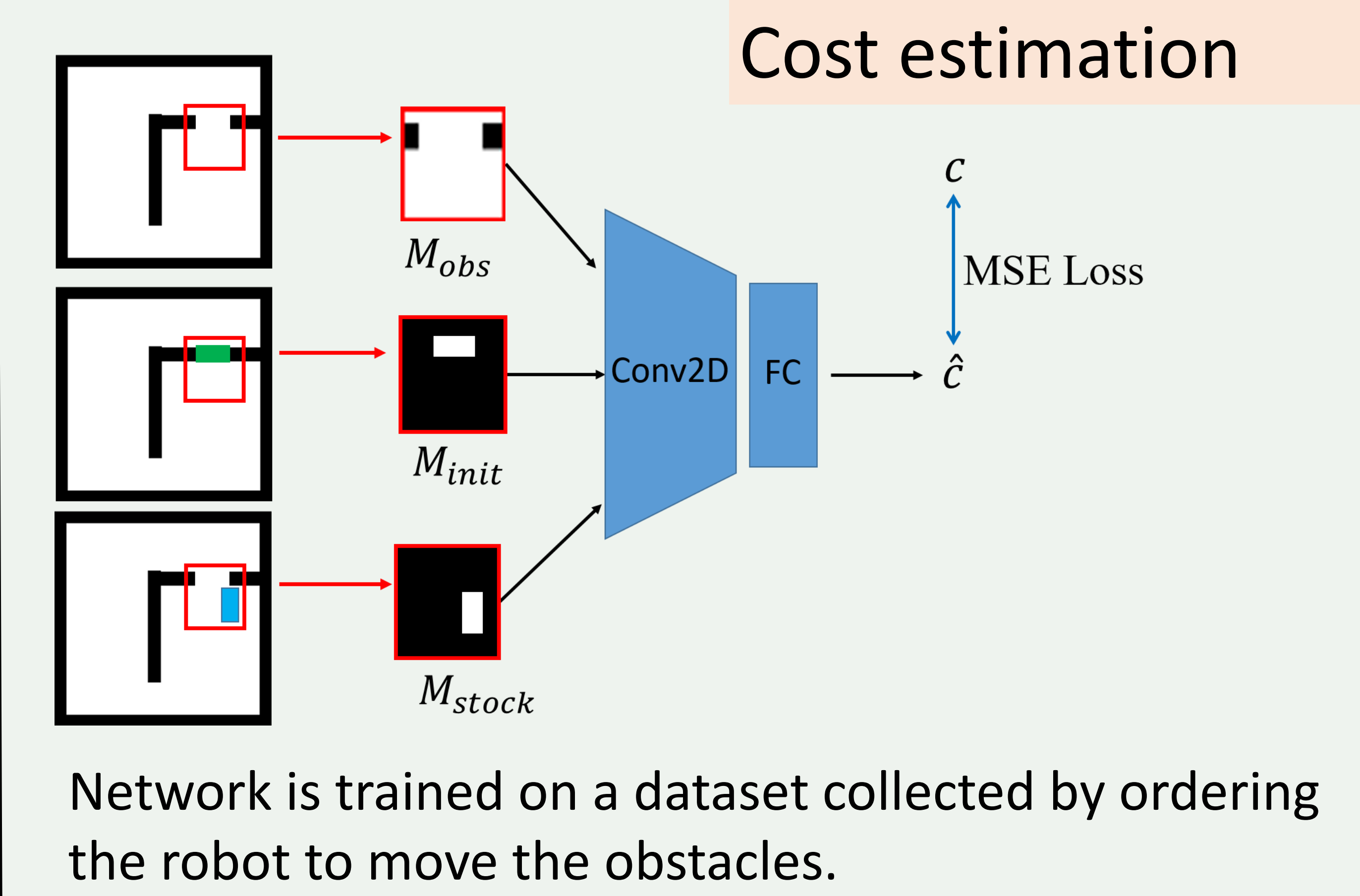
Current solutions:



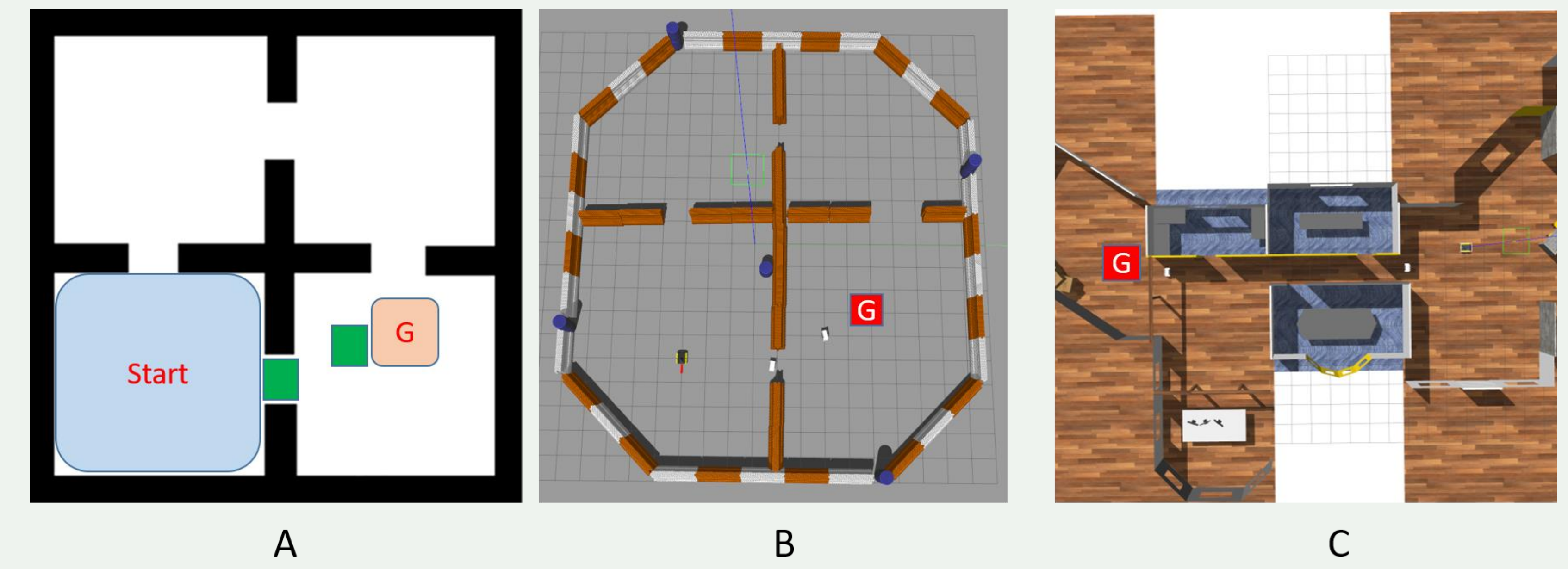
Method



RL policy is trained offline and predicts the moving direction online. The **termination position** is the proposed **stock region**.



Results



Quantitative results in different environments (**Worst**; **Best**)

Env.	Priority bypass (s)	Priority removal (s)	Our method (s)
A	23.4 ± 1.21	21.0 ± 2.35	18.0 ± 1.83
B	76.5 ± 4.22	68.9 ± 2.31	60.6 ± 2.43
C	-	105.1 ± 8.58	95.8 ± 6.14

More test environments and results, find at

