Reinforcement learning and robot navigation

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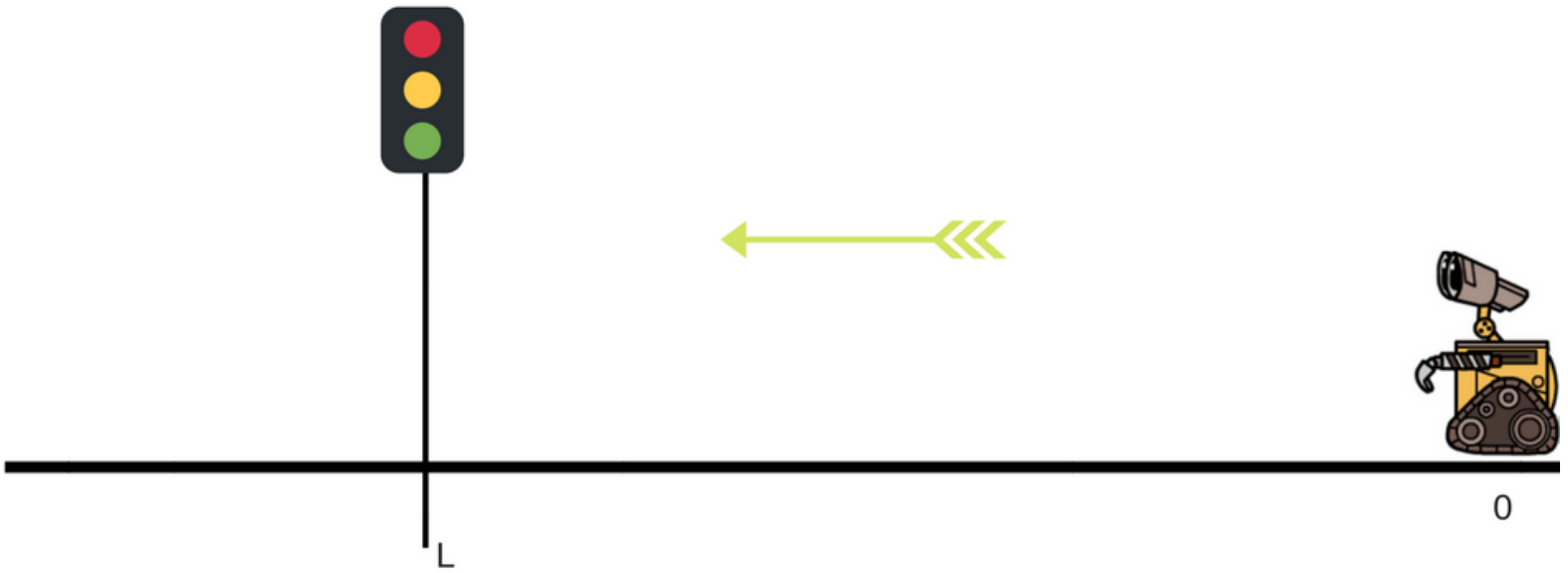
Introduction

The problem

- Framework: a raspberry pi 3 robot which can follow lines
- The task: the robot should adapt its speed with respect to traffic lights
- How: using Reinforcement Learning (RL) and Markov Decision Process (MDP)

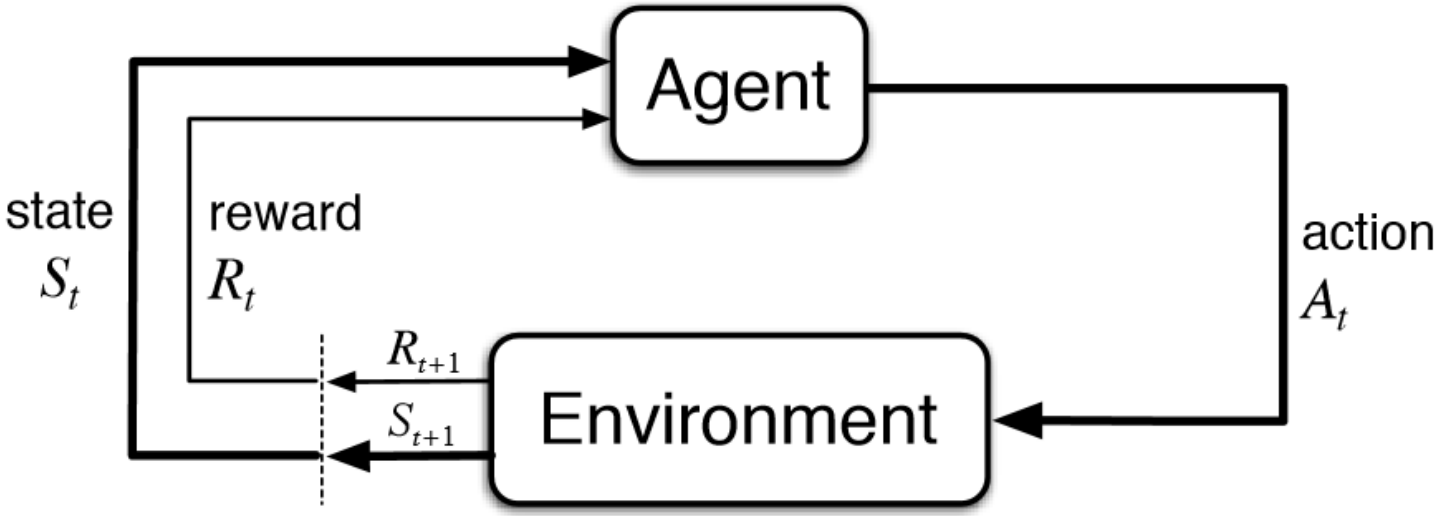
The task



Presentation

- Part I: theoretical background
- Part II: results from first implementations

Reinforcement learning



The agent's job is to find a behavior that maximizes the long-run sum of values of the rewards.

Modelization

States

States are defined in function of:

- distance to the traffic light
- color of the traffic light
- time spent seeing the color of the traffic light
- previous action

Speeds

0,20,30,. . . ,70

Thank you !