Autonomous Agents and Multi-Agent Systems 2020/21
Lab 2: Loading Docks

March 16, 2021

1 Introduction

After completing Lab 01, you can notice that the proposed solution is not scalable. In this laboratory, we will explore a multi-agent setting comprised of three reactive agents. The goal is still the same: agents need to put the coloured boxes on their respective shelves.

A reactive system is one that maintains an ongoing interaction with its environment, and responds to changes that occur in it (in time for the response to be useful). In other words, agents follow a pre-defined set of rules.

2 Environment

In this Section, the student is provided a description of the Loading Docks' environment. Please read it carefully before advancing to the next Sections.

2.1 Entities

This scenario is the same as of the previous lab, except that now it comprises three agents.

2.2 Dynamics

The same dynamics apply, but now the agents should have a reactive behavior, implemented in the *agentDecision* method.

3 Setup

The student is provided a Java project. Eclipse IDE for Java is recommended, but please feel free to use the tool that best suits you.

4 Task

Study the Agent class. After familiarizing yourself with the baseline, do the following tasks:

1. Add 2 agents to the scenario (3 in total);
2. Delineate the set of rules agents need to follow in order to perform the desired goal;
3. Create metrics to evaluate the system;

4.1 Hints

1. See Board.java
2. Think about the conditions that need to be fulfilled for every possible state regarding each agent. Some suggestions: a) what happens if you have a free cell ahead? b) when do you rotate? c) what if you find a ramp? and an empty ramp? d) what do you do when you find a shelf? e) how do you solve collisions with agents?
3. The most appropriate place to track metrics is on the Board. Create a step metric, which tracks the number of steps of the current iteration.