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Police and thief

Reinforcement learning and cooperative AI

Contents

# 1. Abstract

Reinforcement learning is a common field in Artificial Intelligence (A.I.) that seeks to train agents placed in an environment through a series of rewards and punishments. This report describes the training of multi-agents in a competing environment to simulate real-world police catching thieves through reinforcement learning. To induce cooperative behaviours, a well-crafted environment was designed for the agents to interact with. As rewards and punishments are tuned in a purposeful effort to instigate cooperative AI and the police catching thief effect, different behaviours from the agents are observed and recorded.

# 1. Introduction

A paper published on September 19, 2017, by OpenAI describes their research on multi-agent reinforcement learning in a game of hide and seek. By introducing a simple team reward system of …., they were able to observe agents learning more complex strategies such as the agents using of obstacles (even though there are no direct rewards) and eventually the manipulating of the physics engine.