Humanoid Sprinting and Stopping DRL

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Abstract—

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I. Introduction

The RoboCup is an international robotics competition founded in 1997 with the main goal of promoting robotics and AI research, by providing a standard problem where a wide range of technologies can be integrated and examined. The RoboCup Federation organizes a variety of competitions, including soccer, rescue, and home assistance. The soccer competition is the most popular one, and it is divided into several leagues.

This research paper focuses on the Simulation League in which independent software agents play on a virtual soccer field, more specifically on the 3D simulation league, where the agents are based on the NAO humanoid robot.

Sprinting is a fundamental skill in soccer, and it is a key factor in the success of a team as it allows the team to quickly move the ball towards the opponent's goal.

Reinforcement Learning (RL) is a machine learning technique that allows an agent to learn by interacting with its environment. The agent learns to achieve a goal in an uncertain, potentially complex environment. Agents get rewarded for performing correct actions and punished for performing incorrect ones.

The main goal of this research paper is to develop a Deep Reinforcement Learning (DRL) agent that is able to sprint and stop in a simulated soccer environment.

II. Related Work

III. Methodology

IV. Results and Discussion

V. Conclusions and Future Work

VI. Acknowledgments