

Batch: B1

Experiment Number: 1

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Aim of the Experiment: Case Study for Artificial Intelligence Application

Program/ Steps:

- **Researching on how AI is implemented in Robot Soccer Player**
 - **Comparing the Soccer playing robot with the other existing game robots**
 - **Writing the PEAS representation**
 - **Writing the environment type**
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Output/Result:

Brief:

The robot soccer game, as a part of standard applications of distributed system control in real time, provides numerous opportunities for the application of AI. Real-time dynamic strategy description and strategy learning possibility based on game observation are important to discover opponent's strategies, search tactical group movements and synthesize proper counter-strategies. The game is separated into physical part and logical part including strategy level and abstract level. Cluster analysis is used to validate the strategy extraction.

Comparison:

There are number of robots who are playing games, like Chess Robot, Soccer Robot, Gymnastic Robot and many more. The comparison between Gymnastic Robot-Atlas and Soccer playing is that Gymnastic Robot Atlas has performed various jumps, mid-air 180-degree direction changes, and back-flips at different heights with perfect landings. Atlas's advanced control system enables highly diverse and agile locomotion, and the 28 hydraulics joints provide mobility. The robot's algorithms reason through complex dynamic interactions involving the whole body and environment to plan movements. While the Soccer Robot has the Physical abilities like walking, running, and kicking the ball while maintaining balance are crucial to improving robots for other tasks like rescue, home, industry, and education. Results of these applications were already harvested during the 9/11 events, where a team of RoboCup rescuers participated in trying to save people from the collapsing World Trade Center.

PEAS:

Agent Type	Performance Measure	Environment	Actuators	Sensors
Robot Soccer Player	To Play, Make Goal, Win the Game, Defend opponent goal	Field, Team Members, Opponents, Referee, Audience, Soccer	View Detector for Robot, Legs of Robot, Navigator	Camera, Touch Sensors, Communicators, Location sensor, Player's locator

Environment Type:

Environment	Observable	Deterministic / Stochastic	Episodic/ Sequential	Static / Dynamic	Discrete/ Continuous	Agent Type
Robot Soccer Player	Fully	Partly	Sequential	Dynamic	Continuous	Multi

Outcomes:

CO1: Understand structure, types, and PEAS parameters of an AI (Artificial Intelligence) agent and formalize the problem.

Conclusion (based on the Results and outcomes achieved):

Performed case study on Robot Soccer Player & understood the concept of PEAS parameters, environment type and agent type.

References:

https://www.researchgate.net/publication/265105421_Robot_Soccer_Strategy_Description_and_Game_Analysis

<https://www.theverge.com/2019/9/24/20881385/boston-dynamics-atlas-gymnastics-routinesomersaults-split-leap>

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