

Experiment 01 PEAS Description and Environment Characteristics for at least 2 Agent

Experiment 01 a) PEAS Description

Learning Objective: Specify PEAS description for at least 2 Agent.

Tools: MS Word

Theory:

A problem solving agent can be described formally by 4 components:

Performance Measure: How happy the agent is with its performance

Environment: Description of world around

Actuator: The actions taken by Agent

Sensor: What the agent perceives

Implementation:

Problem Description: Satellite image analysis system

Performance Measure: Correct image categorization

Environment: orbit of planet

State Description: Initial state: gathering the visual data of various region of the planet

Final state: transmitting the collected data to the facility

Actuator: boosters, solar panel, signal

Sensor: high resolution camera, thermal imaging sensor

Problem Description: Robot vacuum

Performance Measure: cleaning the room, dirt or dust detection

Environment: house environment, labs

State Description: Initial state: detecting dirt/dust

Final state: cleaning the environment

Actuator: electric motors

Sensor: photocells sensor, infrared sensor

Learning Outcomes: The student should have the ability to

LO1: identify the problem for PEAS description.

LO2: describe the problem in PEAS form.

Course Outcomes: Students will able to

CO2: Understand AI building blocks presented in intelligent agents.

Conclusion: By this experiment we were able to identify the problem for PEAS description. And describe the problem in PEAS (i.e. Performance, Environment, Actuator, Sensor) form.

Experiment 01 b) Environment Characteristics

Learning Objective: Specify Environment characteristics for a toy/real world problem.

Tools: MS Word

Theory:

A problem can be characterized formally into 6 environment types:

Accessible/ Fully observable vs Partially observable: If an agent's sensory apparatus gives it access to the complete state of the environment, then we say that the environment is accessible to that agent. An accessible environment is convenient because the agent need not maintain any internal state to keep track of the world.

Episodic vs Sequential: In an episodic environment, the agent's experience is divided into "episodes." Each episode consists of the agent perceiving and then acting. The quality of its action depends just on the episode itself, because subsequent episodes do not depend on what actions occur in previous episodes. Episodic environments are much simpler because the agent does not need to think ahead.

Static vs Dynamic: If the environment can change while an agent is deliberating, then we say the environment is dynamic for that agent; otherwise it is static. Static environments are easy to deal with because the agent need not keep looking at the world while it is deciding on an action, nor need it worry about the passage of time. If the environment does not change with the passage of time but the agent's performance score does, then we say the environment is semidynamic.

Discrete vs Continuous: If there are a limited number of distinct, clearly defined percepts and actions we say that the environment is discrete.

Deterministic vs Stochastic: If the next state of the environment is completely determined by the current state and the actions selected by the agents, then we say the environment is deterministic. In principle, an agent need not worry about uncertainty in an accessible, deterministic environment. If the environment is inaccessible, however, then it may appear to be nondeterministic.

Single agent vs Multi agent: An agent operating by itself in an environment.

Implementation:

Problem Description: Satellite image analysis system

Accessible/ Fully observable vs Partially observable: Fully observable

Episodic vs Sequential: Sequential

Static vs Dynamic: Dynamic

Discrete vs Continuous: Continuous

Deterministic vs Stochastic: Stochastic

Single agent vs Multi agent: Multi agent

Problem Description: Robot vacuum

Accessible/ Fully observable vs Partially observable: Partially observable

Episodic vs Sequential: Sequential

Static vs Dynamic: Static

Discrete vs Continuous: Continuous

Deterministic vs Stochastic: Stochastic

Single agent vs Multi agent: Single agent

Learning Outcomes: The student should have the ability to

LO1: Identify the problem.

LO2: State task environment.

Course Outcomes: Students will able to

CO2: Understand AI building blocks presented in intelligent agents.

Conclusion: By this experiment we were able to identify the problem. And State task environment.

Viva Questions:

1. Give PEAS Descriptors for a ROBOT meant for cleaning the house.
2. Characterize environment of a ROBOT soccer player.
3. Give PEAS Descriptors and Environment Characteristics for E-commerce Shopping Site.

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [40%]	Attendance / Learning Attitude [20%]	Total
Marks Obtained				