2019

Artificial Intelegence

Assignment

1. Define in your own words the following terms: agent, agent function, agent program, rationality, autonomy, reflex agent, model-based agent, goal-based agent, utility-based agent, learning agent. & 2. Explain the difference between performance measure and the utility measure function.

Sayed Sayeedur Rahman
40th Batch, 153402309
2/23/2019

ASSIGNMENT-01:

1. Define in your own words the following terms: agent, agent function, agent program, rationality, autonomy, reflex agent, model-based agent, goal-based agent, utility-based agent, learning agent.

2. Explain the difference between performance measure and the utility measure function.

What is AI?

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems

Agent:

In artificial intelligence, an intelligent agent (IA) is an autonomous entity which observes through sensors and acts upon an environment using actuators (i.e. it is an agent) and directs its activity towards achieving goals (i.e. it is "rational", as defined in economics).

Agent function:

The **agent function** is a mathematical **function** that maps a sequence of perceptions into action. The **function** is implemented as the **agent** program. The part of the **agent** taking an action is called an actuator. environment -> sensors -> **agent function** -> actuators -> environment.

Agent program:

Artificial intelligence is **defined** as study of rational **agents**. A rational **agent** could be anything which makes decisions, like a person, firm, machine, or **software**. ... An **agent** is anything that can be viewed as : perceiving its environment through sensors and. acting upon that environment through actuators.

Rationality:

Artificial intelligence. Within **artificial intelligence**, a **rational** agent is typically one that maximizes its expected utility, given its current knowledge. ... The **rationality** of human thought is a key problem in the psychology of reasoning.

Autonomy?

An autonomous agent is an *intelligent agent* operating on an owner's behalf but without any interference of that ownership entity.

Reflex agent:

We can summarize part of the table by formulating commonly occurring patterns as condition rules.

Model-based agent:

This knowledge about "how the world evolves" is called a model of the world, hence the name "model-based agent".

Goal-based agent:

Goal-based agents further expand on the capabilities of the model-based agents, by using "goal" information.

Utility-based agent:

A utility-based agent makes decisions based on the maximum utility of its choices. In this lesson, you'll learn more about these intelligent agents and how they interact with their environments.

Learning agent:

A learning agent is a tool in AI that is capable of learning from its experiences Unlike intelligent agents that act on information provided by a programmer learning agents are able to perform tasks, analyze performance and look for new ways to improve on those tasks.

Explain the difference between performance measure and the utility measure function:

Performance measure function	Utility measure function
A performance measure is used to evaluate the behavior of the agent in environment.	A utility function is used by an agent itself to evaluate how desirable states are. Some paths to the goal are better than others.
Does agent do what it's supposed to do vs. does agent do it in optimal way.	The utility function may not be the same as the performance measure.
whereas there is always a performance measure function.	An agent may have no explicit utility function at all.
So in general Performance measure is how we evaluate a agent behavior.	utility function is a function internally used by the agent to evaluate its performance.
They could be same in some cases but it's not necessarily true. Also a performance measure exists always.	a utility function might not.

ASSIGNMENT-02

Missionaries and cannibals problem:

ANS TO THE QUESTION NO: 01