

**Experiment No. 1**

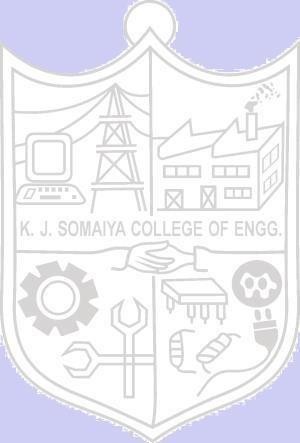
**Title:** Case Study for AI application-PEAS and Task Environments

# Batch: B1 Roll No.:1914078 Experiment No.: 1

**Aim: To comprehend Case Study for AI application for PEAS and Task Environments Resources needed: Internet**

**Theory**

Artificial intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence.

Artificial intelligence is the search for a way to map intelligence into mechanical hardware and enable a structure into that system to formalize thought. No formal definition, as yet, is available for as to what artificial intelligence actually is.

There are numerous definitions of what artificial intelligence is. We end up with four possible goals:

1. Systems that think like humans (focus on reasoning and human framework)
2. Systems that think rationally (focus on reasoning and a general concept of intelligence)
3. Systems that act like humans (focus on behavior and human framework)
4. Systems that act rationally (focus on behavior and a general concept of intelligence) Artificial intelligence has successfully been used in a wide range of fields including medical diagnosis, stock trading, robot control, law, scientific discovery, video games, toys, and Web search engines.

Here are some applications of artificial intelligence:

1. Game playing
2. Speech synthesis, recognition and understanding very useful for limited vocabulary applications unconstrained speech understanding is still too hard
3. Understanding natural language
4. Computer vision works for constrained problems (hand-written zip-codes) understanding real-world, natural scenes are still too hard.
5. Expert systems Learning adaptive systems are used in many applications: have their limits
6. Planning and Reasoning only works for constrained problems: e.g., chess real-world is too complex for general systems.

# PEAS Representation:

**Performance Measure**

Specified by outside observer or evaluator

Applied (consistently) to (one or more) IAs in given environment

# Environment

Reachable states

“Things that can happen” “Where the agent can go” To be distinguished (TBD) from: observable states **Actuators**

What can be performed?

Limited by physical factors and self-knowledge

# Sensors

What can be observed?

Subject to error: measurement, sampling, post processing

# Procedure:

1. For this experiment students have to individually select a topic on any developed AI Agent/application (ex. Apple Siri, a virtual assistant). Get the topic approved from the batch in-charge.
2. Analyze application/agent from artificial intelligence point of view and give description and features for the same.
3. Compare the features of selected AI with other existing AI agents (Google Assistant, Samsung Bixby) in terms of few performance metrics
4. Give its PEAS representation in table format
5. Identify the type of AI agent and type of Environment for chosen application/AI agent.

# Results: (Softcopy submission of Summary Document)

# 1. Tesla’s self-driving AI

# It is an autopilot software used in Tesla manufactured cars which runs on neural networks, continuously scanning its environment i.e. the road, signal lights and other vehicles around it to control the vehicle safely and transport the passengers.

# 2. Features:

# It is classified as a Level 2 under SAE levels of vehicle automation.

# Uses neural networks to make decisions

* **Traffic-Aware Cruise Control**: Matches the speed of your car to that of the surrounding traffic
* **Autosteer**: Assists in steering within a clearly marked lane, and uses traffic-aware cruise control

# 3. Tesla autopilot versus GM Super Cruise

|  |  |
| --- | --- |
| Sensors: 8 cameras, 12 ultrasonic sensors | Cameras, sensors and LiDAR mapping |

# 4. PEAS table

|  |  |  |  |
| --- | --- | --- | --- |
| Performance | Environment | Actuators | Sensors |
| Passenger comfort, legal driving, efficient drive | Roads and lanes, vehicles, traffic signals, signs | Steering wheel, accelerator, brakes, brake lights | Eight cameras that look in all directions, 12 ultrasonic sensors, |

# 5. Type of agent

# It is a goal-based agent

# Environment

# Partially observable

# Stochastic

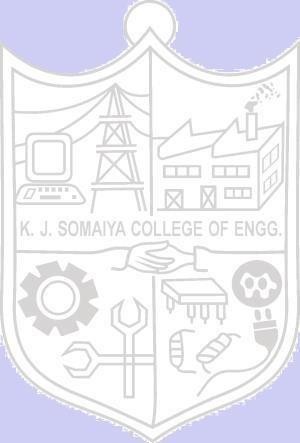
# Collaborative

# Multi agent

# Dynamic

# Continuous

**Outcomes:** Understood structure, types and PEAS parameters of an AI(Artificial Intelligence) agent and formalize the problem.

**Conclusion:** Completed case study of Tesla autopilot AI

**Grade: AA / AB / BB / BC / CC / CD /DD**

**Signature of faculty in-charge with date**

**References:**

* Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Second Edition, Pearson Publication
* Elaine Rich, Kevin Knight, Artificial Intelligence, Tata McGraw Hill, 1999.