



SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF CSE-IoT ENGINEERING



Artificial Intelligence & Natural Language Processing

The Structure of Intelligent Agents

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The Structure of Agents

Definition:

The **structure of an AI agent** refers to the way it **processes information, makes decisions, and interacts** with its environment.

Components of an AI Agent

1. Perception (Sensors)

1. The agent **gathers data** from the environment.

2. Examples:

1. Self-driving cars use **cameras and LiDAR**.
2. Virtual assistants use **microphones for voice input**.



The Structure of Agents

2. Processing (Decision-Making Unit)

1. The agent **analyzes data and makes decisions**.
2. Uses algorithms such as:
 1. **Rule-Based Logic** (IF-THEN statements)
 2. **Machine Learning Models**
 3. **Neural Network**

3. Action (Actuators or Outputs)

1. The agent **executes the decision** based on the analysis.
2. **Examples:**
 1. A robotic arm moving an object.
 2. A chatbot responding to a query.

4. Learning (Feedback Mechanism)

1. The agent **improves over time** by learning from experience.
2. Uses **reinforcement learning** or **self-correction techniques**.



Summary Table: Key Concepts

Concept	Definition	Key Points	Examples
Rationality	The ability to make optimal decisions to maximize performance.	Uses available data, adapts to new situations, handles uncertainty.	Self-driving cars, AI chatbots.
Nature of Environments	The external world in which an agent operates.	Fully/Partially observable, Deterministic/Stochastic, Static/Dynamic, Single/Multi-Agent.	Chess game (deterministic), Stock market (stochastic).
Structure of Agents	The internal framework of an AI system.	Sensors (perception), Decision-making unit (processing), Actuators (actions), Learning mechanism.	Robots, Virtual assistants (Siri, Alexa).



Conclusion

- **A Rational AI Agent** always makes the **best decision** based on available information.
- **Environments** define how AI must adapt and react to **changing conditions**.
- **Agent Structure** ensures AI systems can **sense, process, act, and learn** efficiently.



Thank you