Artificial Intelligence and Knowledge Representation

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What is AI?

Artficial Intelligence, or AI, refers to machines designed to mimic human intelligence by performing tasks like learning and decision-making

Why is Knowledge Representation Important?

Knowledge representation structures information in a way that AI can reason, learn, and make decisions efficiently.

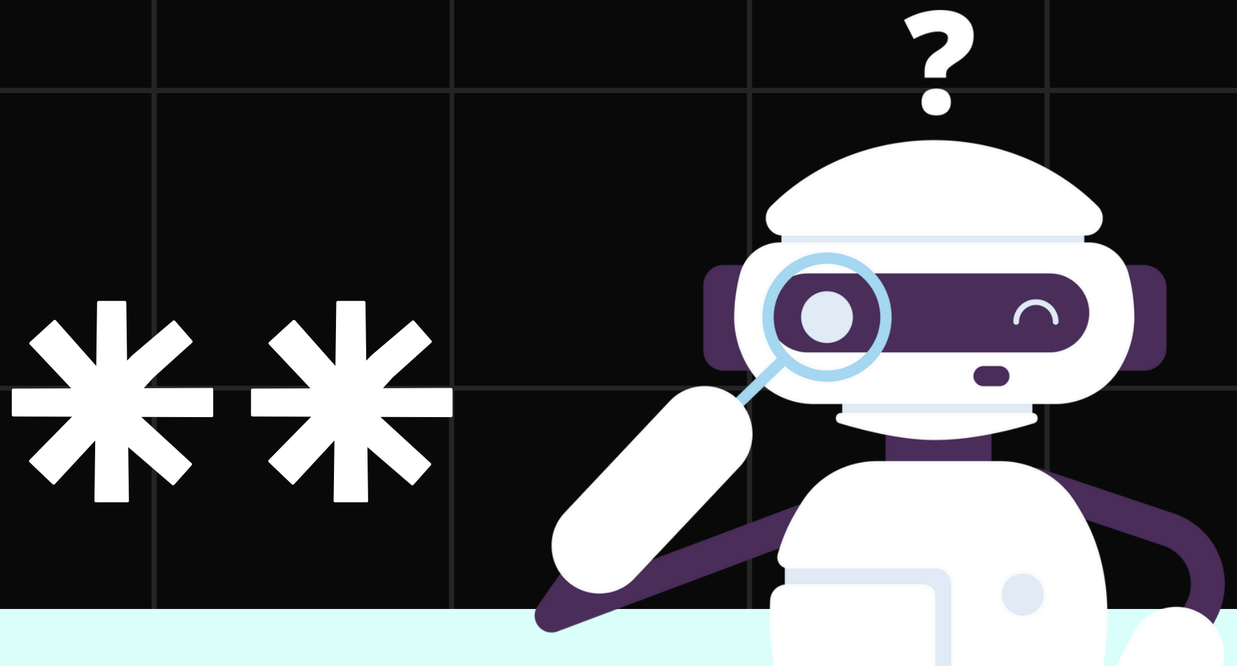
Types of Knowledge Representation

Semantic Networks

Visual representation of knowledge using nodes (concepts) and edges (relationships). Example: A network connecting symptoms (e.g., fever, cough) to diagnoses (e.g., flu, cold).

Frames

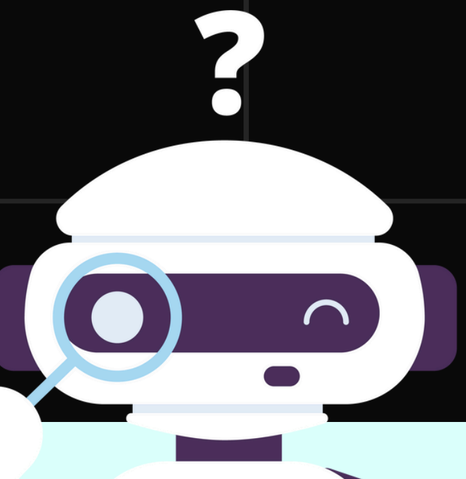
Structured data about objects or situations, used in AI systems like expert systems. Example: A medical frame containing patient data (age, symptoms, etc.)



Logic-based Representations

Represent knowledge through logical formulas and rules, like Propositional and Predicate Logic.

Medical Diagnosis System



Application

AI in healthcare is widely used in medical diagnosis

Knowledge Representation

Systems often use ontologies (hierarchies of medical terms) and decision trees for reasoning

Problem Addressed

- These AI systems help doctors by analyzing symptoms and suggesting possible conditions, speeding up diagnosis.

Knowledge Representation Model for Diagnosing Disease

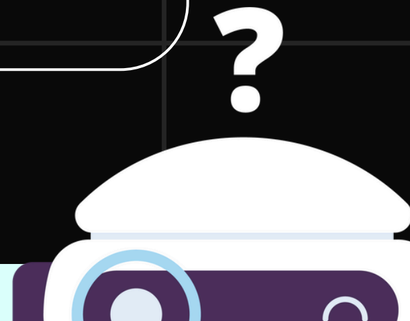
Problem

Diagnosing a patient’s condition based on symptoms like fever and cough.

Model

A Semantic Network that connects symptoms to diseases.

- Nodes: Symptoms (e.g., “Fever,” “Cough”) and diseases (e.g., “Flu,” “COVID-19”).
- Edges: Labeled edges (e.g., “causes,” “associated with”) showing relationships between symptoms and diseases



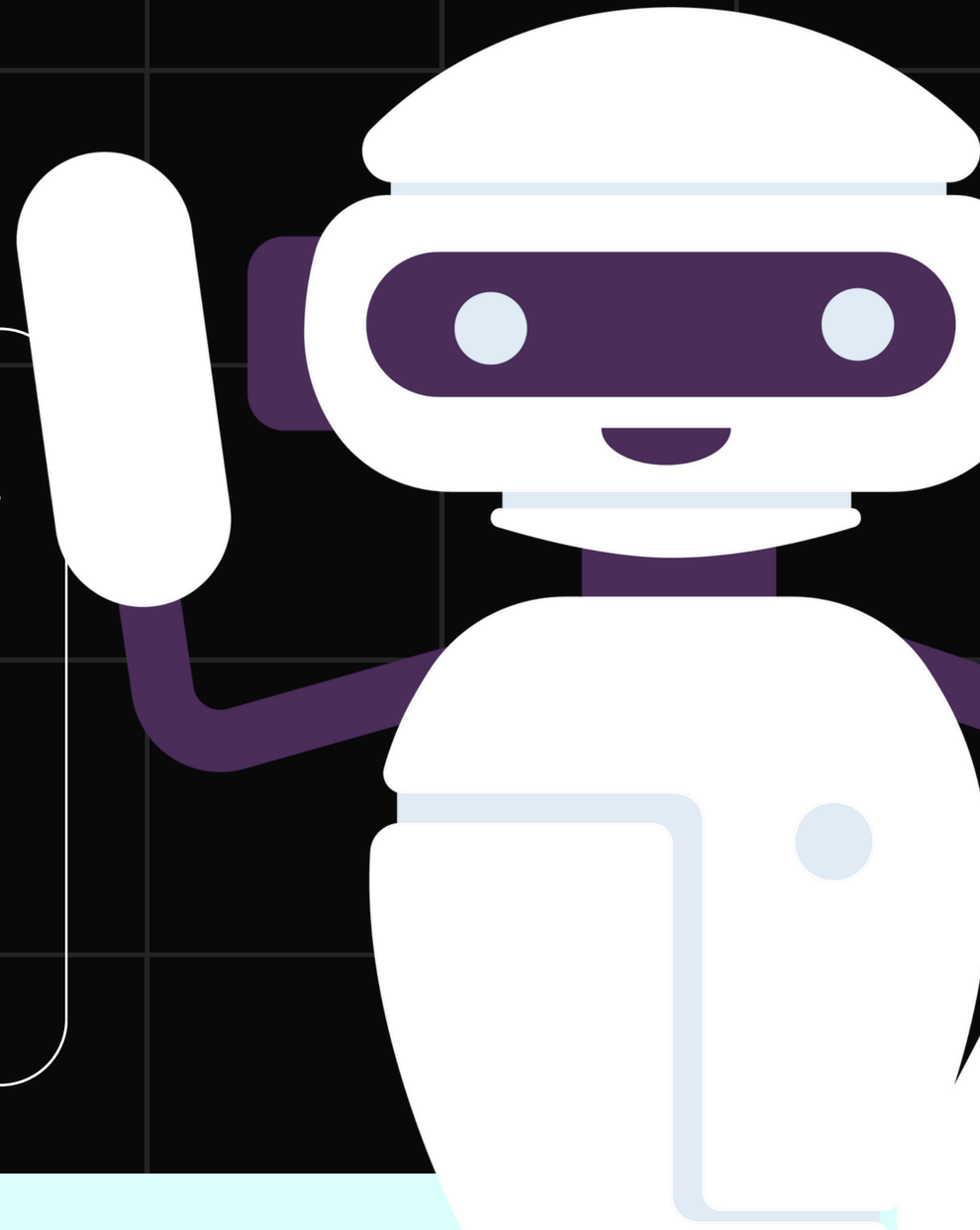
Conclusion

Knowledge representation is crucial for AI systems to process and reason with information.

It allows AI to understand context, make decisions, and solve problems

Reflection

This activity highlights how AI systems rely on structured knowledge to function effectively.



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Thankyou