

# Exploring the Role of Knowledge Representation in AI

Understanding how knowledge representation enables AI systems to reason and learn effectively

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BSCS 3B



# Understanding Artificial Intelligence

Exploring the Critical Role of Knowledge Representation in AI SYSTEMS

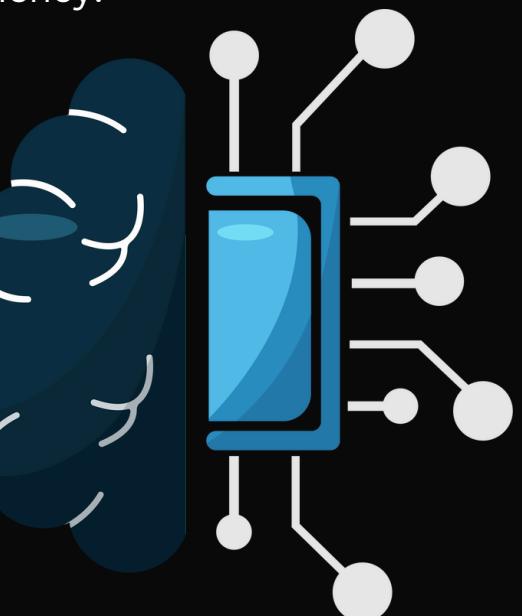


## Improving Decision-Making

Properly represented knowledge enables AI to reason and enhance decision-making, which is crucial for handling complex tasks.

## Significance of knowledge

Effective AI requires strong knowledge systems, which in turn need data to learn and make informed decisions.



## Diverse AI Application

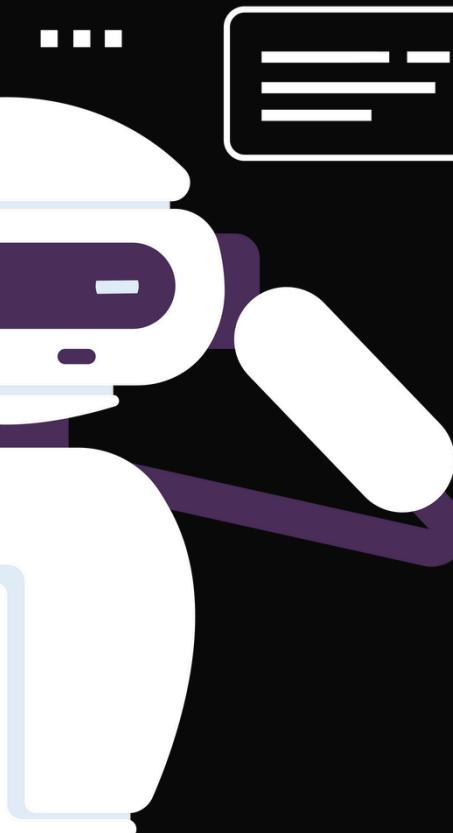
AI boosts healthcare, finance, retail, transportation, education, entertainment, agriculture, manufacturing, security, and environmental efforts with improved diagnostics, personalized services, and efficiency.

## Preparing for the discussion

Grasping these concepts is vital for a deeper exploration of knowledge representation in AI

## Knowledge representation

The ability of AI to encode, retrieve, and process information, thereby mimicking human cognitive abilities.



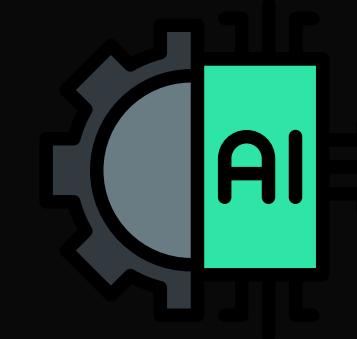
# Knowledge Representation

## Type of Knowledge Representation



### Semantic Network

Graphs showing concepts as nodes and relationships as edges.



### frames

Data structures with slots and values representing objects or events.



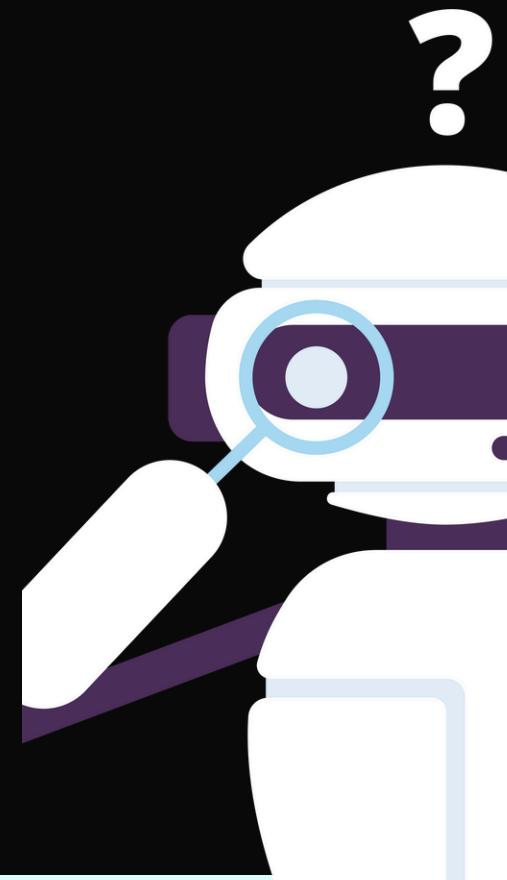
### Ontologies

Structured frameworks defining entities and their relationships.



### Logic-Based Representation

Uses formal logic to represent and reason about facts and relationships.



# Case Study: Medical Diagnosis Systems

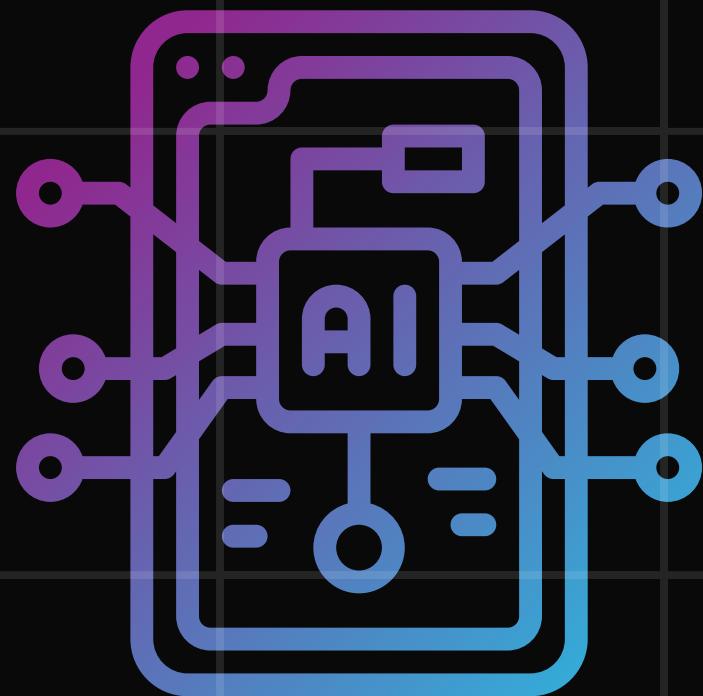
Understanding the Impact of Knowledge Representation in Healthcare

## Semantic Network

represent knowledge by linking medical concepts like symptoms, diseases, and treatments through nodes and edges, which helps manage complex relationships, integrate diverse information, understand context, and support decision-making.

## Frame for Patient Data

organize patient data into structured templates with attributes like symptoms and test results, aiding in accurate, context-aware diagnoses and effective management of complex cases.



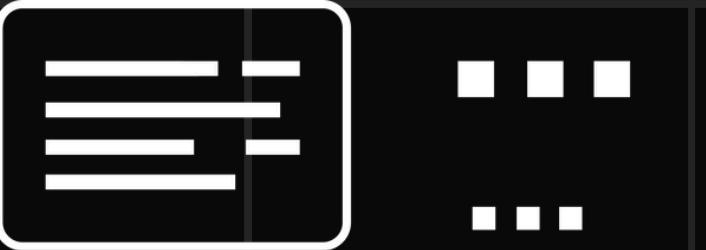
## Accurate Diagnosis

systems is achieved by structuring and integrating diverse medical data, ensuring contextually relevant and comprehensive diagnostic support.

## Otologies in Medicine

medical diagnosis systems provide a structured framework for defining and relating medical concepts, which ensures standardization, enhances comprehensive understanding, facilitates data integration, and improves interoperability.





# Your Knowledge Representation Model

Understanding a Practical AI Application for Diabetic Diet

## Problem Identification

solves problems by offering personalized, balanced meal plans and adapting recommendations based on user data and health changes.

## Knowledge Graph Structure

helps the AI system by organizing information about foods, nutrients, and their effects on blood sugar, enabling personalized and adaptable meal recommendations.

## AI Inference Capability

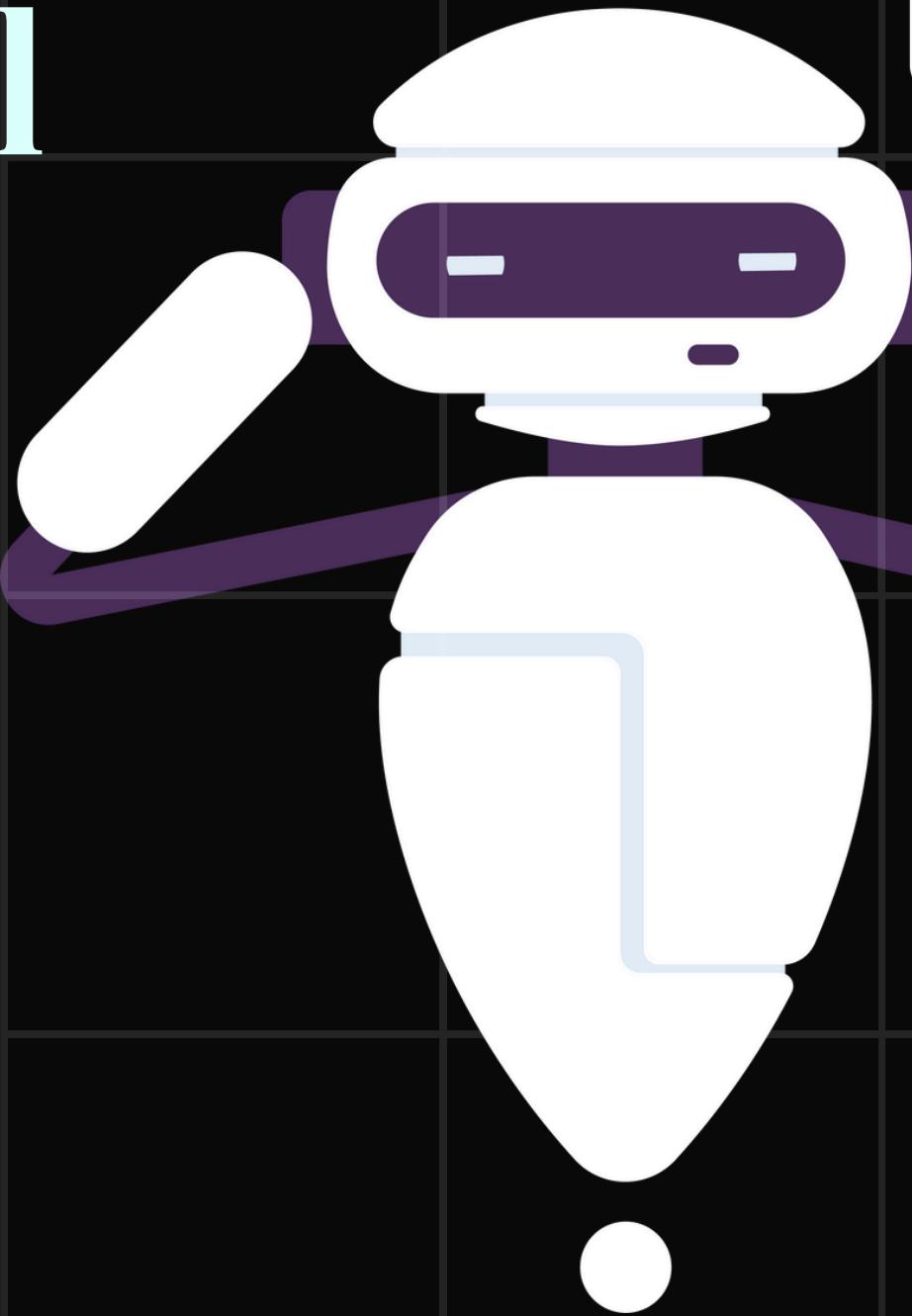
enhance diabetic diet management by analyzing data to deliver personalized, accurate, and adaptable dietary recommendations.

## Enhanced Patient Outcomes

enhances patient outcomes by providing personalized and adaptive meal plans that help control blood sugar levels and improve overall diabetes management.

## Practical Application

The model helps manage diabetic diets by using patient data to create personalized meal plans and adjusting them as health changes, improving blood sugar control and overall health.

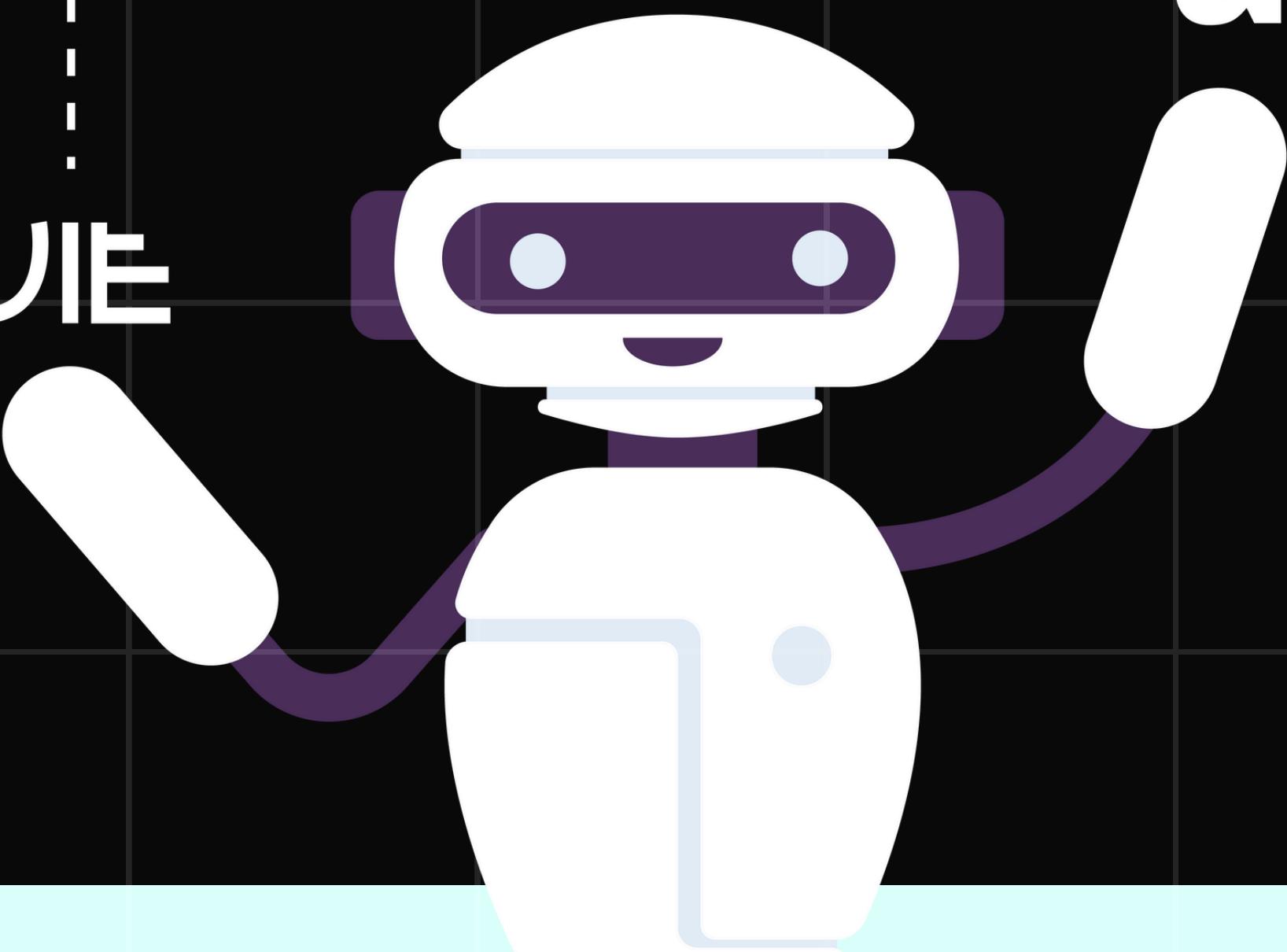
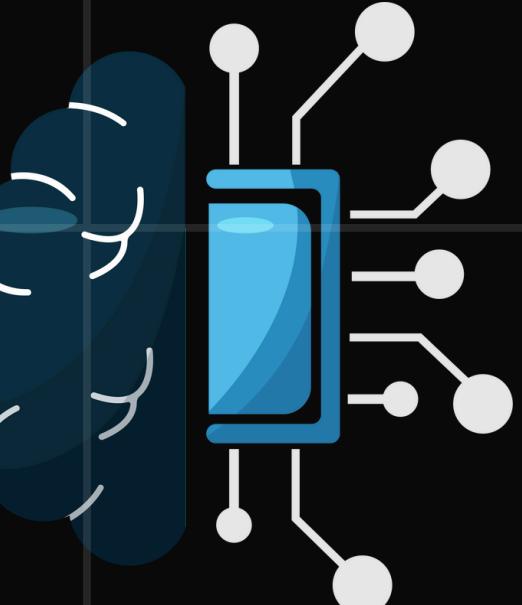


The AI medicine diagnosis system, through its advanced methods such as data analysis, personalized recommendations, and continuous adaptation, significantly enhances diagnostic accuracy and patient care.

As AI technology evolves, its methods will become more sophisticated, leading to even more precise diagnoses and improved healthcare outcomes.

Embracing these advancements will continue to transform the effectiveness and efficiency of medical diagnoses.

# Conclusion and Reflection



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# Thankyou

Encouragement to keep exploring and innovating with AI to solve societal problems and improve people's lives.

