



Rajiv Gandhi University of Knowledge Technologies

Catering to the Educational Needs of Gifted Rural Youth of Andhra Pradesh
(Established by the Govt. of Andhra Pradesh and recognized as per Section 2(f) of UGC Act, 1956)

Rajiv Knowledge Valley Campus

Department of Computer Science and Engineering

Artificial Intelligence Day-3

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Agenda



AI Techniques



Criteria for Success



Quote of the Day



Info of the Day





AI Techniques

Machine Learning

Expert Systems

Deep Learning

Knowledge Representation

Natural Language Processing

Robotics

Computer Vision

Fuzzy Logic

Search & Optimization

Evolutionary Algorithms



Machine Learning

Machine Learning is a subset of AI that focuses on training machines to learn from data and improve over time without explicit programming.

Supervised Learning : Learning with labelled data

Unsupervised Learning : Finding patterns in unlabeled data

Reinforcement Learning : Learning through rewards and penalties in an interactive environment

Deep Learning

Deep Learning is a specialized form of Machine Learning that uses artificial neural networks with multiple layers to process complex data.

Convolutional Neural Networks (CNNs): Used for image processing

Recurrent Neural Networks (RNNs): Used for sequential data like text or time series

Transformers : Advanced architectures for natural language understanding

Generative Adversarial Networks (GANs): Used for generating realistic images, videos ...etc.



Natural Language Processing

NLP focuses on enabling machines to understand, interpret, and generate human language.

Text Tokenization: Breaking text into meaningful units.

Sentiment Analysis: Determining the sentiment in text

Chatbots and Virtual Assistants: Using NLP for conversational AI.

Computer Vision

Computer vision is an AI technique that helps machines interpret and analyze visual data like images or videos. It mimics human vision to extract information and make decisions.

Image Recognition: Identifies objects or elements in an image

Object Detection: Finds and locates multiple objects in an image

Image Segmentation: Divides an image into parts for detailed analysis



Search & Optimization

Search algorithms and optimization techniques help solve problems by exploring possible solutions.

Heuristic Search: Shortcuts to find efficient solutions

Genetic Algorithms: Mimicking natural selection to optimize solutions

Expert Systems

Expert Systems are rule-based programs that mimic human decision-making in specific domains.

Knowledge Base: Stores facts and rules.

Inference Engine: Applies rules to known facts to deduce new information.

Knowledge Representation

It helps machines organize and use knowledge to make decisions.

Semantic Networks: Show relationships between ideas or concepts.

Ontologies: Define concepts and their connections in a structured way.

Rule-Based Systems: Use "if-then" rules to solve problems or make decisions.



Robotics

Robotics combines AI techniques for controlling and automating physical robots.

Path Planning: Finding the best route for movement.

Motion Control: Managing the robot's movements.

Sensor Integration: Processing data from cameras, lidar, or other sensors.

Fuzzy Logic

Fuzzy Logic deals with reasoning that is approximate rather than exact, enabling AI to make decisions in uncertain or ambiguous situations.

Examples :

Washing machines use fuzzy logic to adjust water based on load size.

Evolutionary Algorithms

Evolutionary algorithms are inspired by natural evolution processes like selection, mutation, and crossover. They help find the best solutions to complex problems by iteratively improving a population of possible answers.

Genetic Algorithms: Mimic natural selection to optimize solutions.



Criteria for Success

Accuracy & Performance

The AI system should perform its tasks with high accuracy and minimal errors.
Example: Metrics such as precision, recall, F1-score, and ROC-AUC are used for evaluation in supervised learning models.

Scalability

The AI system should handle increasing amounts of data and users without performance degradation.

Example: A recommendation system must efficiently handle millions of users.

Generalization

The AI model should perform well on unseen data, not just on the training dataset.

Example: A fraud detection system must accurately detect new types of fraud.

Efficiency

The system should operate within acceptable time and resource constraints.

Example: Real-time facial recognition systems require low latency.

Robustness

The AI must maintain functionality when faced with unexpected input or variations in data.

Example: A self-driving car must perform reliably in different weather conditions.



Criteria for Success

Interpretability & Explainability

The AI system's decisions and actions should be understandable to users and stakeholders.

Example: AI models used in healthcare should explain diagnoses.

Ethical Compliance

The AI system should adhere to ethical guidelines, avoiding bias and ensuring fairness

Example: Loan approval systems must not discriminate based on gender

User Satisfaction

The AI system should meet user expectations by being functional, reliable, and user-friendly.

Example: Virtual assistants like Siri or Alexa provide relevant responses.

Security and Privacy

The AI system must protect sensitive data and prevent unauthorized access.

Example: AI systems in finance must ensure data encryption and secure transactions.

Cost-Effectiveness

The AI system's benefits should be greater than its costs.

Example: AI tools should save money by automating tasks.



Which AI technique focuses on understanding and generating human language?

A) Computer Vision

B) Fuzzy Logic

C) Knowledge Representation

D) Natural Language Processing



Computer Vision includes which of the following tasks?

A) Image Recognition and Sentiment Analysis

B) Rule-Based Decision-Making

C) Object Detection and Image Segmentation

D) Semantic Networks and Ontologies



In the context of AI success, Generalization refers to:

A) Achieving high accuracy on the training dataset

B) Reducing costs of implementation

C) Performing well on new and unseen data

D) Handling multiple user inputs simultaneously



Which AI technique is used in self-driving cars to process real-time visual data?

A) Fuzzy Logic

B) Natural Language Processing

C) Knowledge Representation

D) Computer Vision



Deep learning models excel in image recognition tasks because they:

A) Use rule-based systems for precise decision-making

B) Are capable of hierarchical feature extraction through layers

C) Depend on fuzzy logic for handling uncertainties

D) Implement knowledge graphs to link visual data



Which of the following best describes the advantage of rule-based systems in Knowledge Representation?

A) They excel in ambiguous scenarios with incomplete data.

B) They use predefined "if-then" rules for precise decision-making.

C) They are ideal for unsupervised learning problems.

D) They learn and evolve autonomously without human input.



Which of the following is NOT a criterion for AI success?

A) Accuracy and Performance

B) Generalization

C) Unlimited Data Usage

D) Explainability



A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?

A) Rs. 375

B) Rs. 400

C) Rs. 600

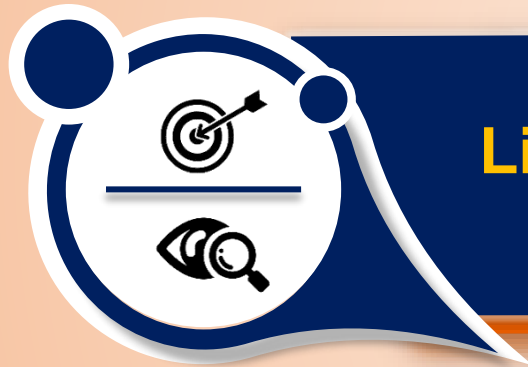
D) Rs. 800

Anagrams

Input : string1 : listen string2:silent Output: Anagrams



Quote of the Day



Life and **Time** are world's best teachers
Life teaches us to Make good use of Time And
Time teaches us the Value of the Life



Info of the Day



Naina Jaiswal

Naina Jaiswal, born on March 22, 2000, in Hyderabad, India, is a distinguished table tennis player and academic prodigy. She completed her 10th grade at the age of 8, followed by her Intermediate studies at 10. By 13, she graduated from St. Mary's College, Hyderabad, and at 15, she completed her post-graduation from Osmania University. She began her PhD studies at 17, focusing on the role of micro-finance in women's empowerment in the Telangana district of Mehboobnagar, and earned her doctorate by 22, becoming one of India's youngest female PhD holders.



Thank You

