

iSQI

CT-AI_v1.0_World

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Question: 1

Which ONE of the following characteristics is the least likely to cause safety related issues for an AI system?

- A. Non-determinism
- B. Robustness
- C. High complexity
- D. Self-learning

Answer: B

Explanation:

The question asks which characteristic is least likely to cause safety-related issues for an AI system. Let's evaluate each option:

Non-determinism (A) : Non-deterministic systems can produce different outcomes even with the same inputs, which can lead to unpredictable behavior and potential safety issues.

Robustness (B) : Robustness refers to the ability of the system to handle errors, anomalies, and unexpected inputs gracefully. A robust system is less likely to cause safety issues because it can maintain functionality under varied conditions.

High complexity (C) : High complexity in AI systems can lead to difficulties in understanding, predicting, and managing the system's behavior, which can cause safety-related issues.

Self-learning (D) : Self-learning systems adapt based on new data, which can lead to unexpected changes in behavior. If not properly monitored and controlled, this can result in safety issues.

References :

ISTQB CT-AI Syllabus Section 2.8 on Safety and AI discusses various factors affecting the safety of AI systems, emphasizing the importance of robustness in maintaining safe operation.

Question: 2

Which ONE of the following statements correctly describes the importance of flexibility for AI systems?

- A. AI systems are inherently flexible.
- B. AI systems require changing of operational environments; therefore, flexibility is required.
- C. Flexible AI systems allow for easier modification of the system as a whole.
- D. Self-learning systems are expected to deal with new situations without explicitly having to program for it.

Answer: C

Explanation:

Flexibility in AI systems is crucial for various reasons, particularly because it allows for easier modification and adaptation of the system as a whole.

AI systems are inherently flexible (A) : This statement is not correct. While some AI systems may be designed to be flexible, they are not inherently flexible by nature. Flexibility depends on the system's design and implementation.

AI systems require changing operational environments; therefore, flexibility is required (B) : While it's true that AI systems may need to operate in changing environments, this statement does not directly address the importance of flexibility for the modification of the system.

Flexible AI systems allow for easier modification of the system as a whole (C) : This statement correctly describes the importance of flexibility. Being able to modify AI systems easily is critical for their maintenance, adaptation to new requirements, and improvement.

Self-learning systems are expected to deal with new situations without explicitly having to program for it (D) : This statement relates to the adaptability of self-learning systems rather than their overall flexibility for modification.

Hence, the correct answer is C. Flexible AI systems allow for easier modification of the system as a whole.

References :

ISTQB CT-AI Syllabus Section 2.1 on Flexibility and Adaptability discusses the importance of flexibility in AI systems and how it enables easier modification and adaptability to new situations.

Question: 3

In the near future, technology will have evolved, and AI will be able to learn multiple tasks by itself without needing to be retrained, allowing it to operate even in new environments. The cognitive abilities of AI are similar to a child of 1-2 years.'

In the above quote, which ONE of the following options is the correct name of this type of AI?

- A. Technological singularity
- B. Narrow AI
- C. Super AI
- D. General AI

Answer: D

Explanation:

- A. Technological singularity

Technological singularity refers to a hypothetical point in the future when AI surpasses human intelligence and can continuously improve itself without human intervention. This scenario involves capabilities far beyond those described in the question.

- B. Narrow AI

Narrow AI, also known as weak AI, is designed to perform a specific task or a narrow range of tasks. It does not have general cognitive abilities and cannot learn multiple tasks by itself without retraining.

- C. Super AI

Super AI refers to an AI that surpasses human intelligence and capabilities across all fields. This is an advanced concept and not aligned with the description of having cognitive abilities similar to a young child.

- D. General AI

General AI, or strong AI, has the ability to understand, learn, and apply knowledge across a wide range of tasks, similar to human cognitive abilities. It aligns with the description of AI that can learn multiple tasks and operate in new environments without needing retraining.

Question: 4

A software component uses machine learning to recognize the digits from a scan of handwritten numbers. In the scenario above, which type of Machine Learning (ML) is this an example of?

- A. Reinforcement learning
- B. Regression
- C. Classification
- D. Clustering

Answer: C

Explanation:

Recognizing digits from a scan of handwritten numbers using machine learning is an example of classification. Here's a breakdown:

Classification : This type of machine learning involves categorizing input data into predefined classes. In this scenario, the input data (handwritten digits) are classified into one of the 10 digit classes (0-9).

Why Not Other Options :

Reinforcement Learning : This involves learning by interacting with an environment to achieve a goal, which does not fit the problem of recognizing digits.

Regression : This is used for predicting continuous values, not discrete categories like digit recognition.

Clustering : This involves grouping similar data points together without predefined classes, which is not the case here.

References: The explanation is based on the definitions of different machine learning types as outlined in the ISTQB CT-AI syllabus, specifically under supervised learning and classification.

Question: 5

The activation value output for a neuron in a neural network is obtained by applying computation to the neuron.

Which ONE of the following options BEST describes the inputs used to compute the activation value?

- A. Individual bias at the neuron level, activation values of neurons in the previous layer, and weights assigned to the connections between the neurons.
- B. Activation values of neurons in the previous layer, and weights assigned to the connections between the neurons.
- C. Individual bias at the neuron level, and weights assigned to the connections between the neurons.
- D. Individual bias at the neuron level, and activation values of neurons in the previous layer.

Answer: A

Explanation:

In a neural network, the activation value of a neuron is determined by a combination of inputs from the previous layer, the weights of the connections, and the bias at the neuron level. Here's a detailed breakdown:

Inputs for Activation Value:

Activation Values of Neurons in the Previous Layer: These are the outputs from neurons in the preceding layer that serve as inputs to the current neuron.

Weights Assigned to the Connections: Each connection between neurons has an associated weight, which determines the strength and direction of the input signal.

Individual Bias at the Neuron Level: Each neuron has a bias value that adjusts the input sum, allowing the activation function to be shifted.

Calculation:

The activation value is computed by summing the weighted inputs from the previous layer and adding the bias.

Formula: $z = \sum (w_i \cdot a_i) + b$, where w_i are the weights, a_i are the activation values from the previous layer, and b is the bias.

The activation function (e.g., sigmoid, ReLU) is then applied to this sum to get the final activation value.

Why Option A is Correct:

Option A correctly identifies all components involved in computing the activation value: the individual bias, the activation values of the previous layer, and the weights of the connections.

Eliminating Other

B. Activation values of neurons in the previous layer, and weights assigned to the connections between the neurons : This option misses the bias, which is crucial.

C. Individual bias at the neuron level, and weights assigned to the connections between the neurons : This option misses the activation values from the previous layer.

D. Individual bias at the neuron level, and activation values of neurons in the previous layer : This option misses the weights, which are essential.

References:

ISTQB CT-AI Syllabus, Section 6.1, Neural Networks, discusses the components and functioning of neurons in a neural network.

"Neural Network Activation Functions" (ISTQB CT-AI Syllabus, Section 6.1.1).

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