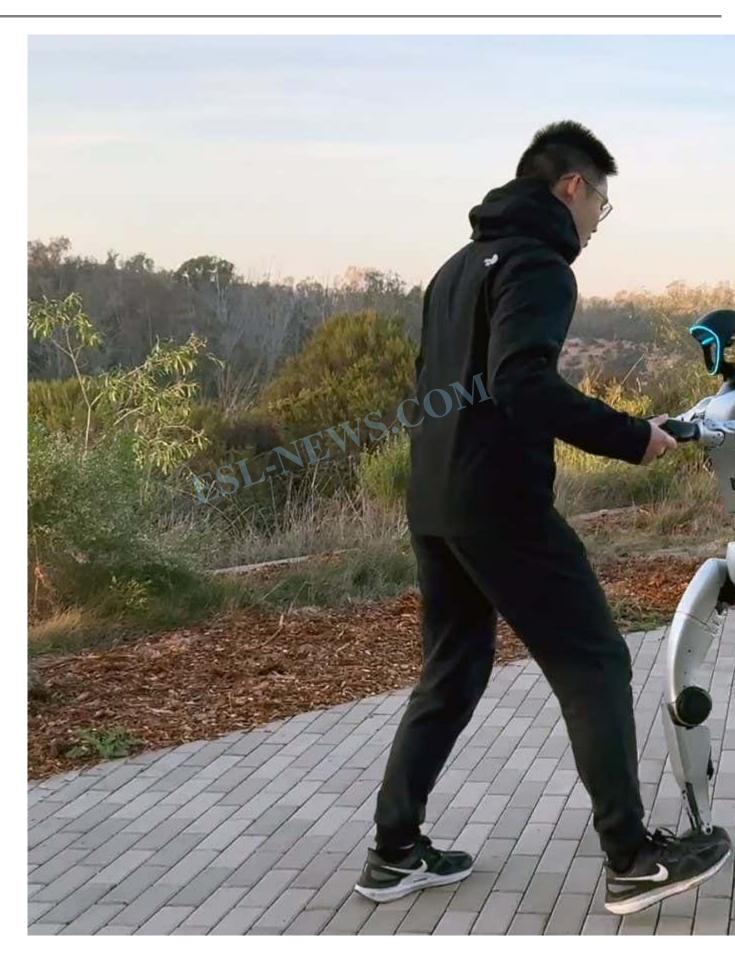# Robot waltzes by mirroring human movements: a captivating feat

Description

A humanoid robot waltzes with help from an AI trained on human motion capture recordings

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Have you ever wondered how robots can move so gracefully like humans? Scientists at the University of California, San Diego, have developed an AI system called ExBody2 that teaches robots to mimic human movements in a more lifelike manner. This means robots can walk, dance, and even fight in ways that are convincing and human-like.

The key to this technology is a database of human movements gathered from motion capture recordings. By training the AI system on this data, robots can quickly learn to perform a variety of actions similar to how humans do. Using reinforcement learning, the AI system can analyze successful movements and then replicate them on robotic platforms.

ExBody2 has already been tested on commercial humanoid robots, showcasing its ability to perform tasks like walking, crouching, dancing, and interacting with humans. This advancement in robotics opens up new possibilities for robots to have a wider range of capabilities by coordinating their limbs and joints effectively.

Watch the video above to see ExBody2 in action!

Topics: Robotics, Artificial Intelligence, Humanoid Robots

Vocabulary List:

1. **Mimic** /ˈmɪmɪk/ (verb): To imitate or replicate actions or behaviors.
2. **Lifelike** /ˈlaɪfˌlaɪk/ (adjective): Resembling or simulating the characteristics of a living being.
3. **Reinforcement** /ˌriːɪnˈfɔːrsmənt/ (noun): The process of encouraging or establishing a certain response or behavior.
4. **Capable** /ˈkeɪ.pə.bəl/ (adjective): Having the ability or competence to perform a task or function.
5. **Capabilities** /ˌkeɪ.pəˈbɪl.ɪ.tiz/ (noun): The qualities or features that enable someone or something to perform a function.
6. **Interact** /ˌɪn.tə'rækt/ (verb): To act in such a way that has an effect on another; to communicate or engage with others.

Comprehension Questions

Multiple Choice

1. What is the name of the AI system developed by scientists at the University of California, San Diego, to teach robots to mimic human movements?

    Option: ExBody1
    Option: ExBody2
    Option: RoboMimic
    Option: HumanoidAI

2. What is the key to the technology that enables robots to move gracefully like humans?

    Option: DNA sequencing
    Option: Database of human movements from motion capture recordings
    Option: Machine translation
    Option: Social media scanning

3. How do robots learn to perform a variety of actions similar to how humans do?

    Option: By watching movies
    Option: By trial and error
    Option: By uploading data directly to their systems
    Option: By training the AI system on human movement data

4. What technology is used by the AI system to replicate successful human movements on robotic platforms?

    Option: Image recognition
    Option: Reinforcement learning
    Option: Virtual reality
    Option: Augmented intelligence

5. Which tasks has ExBody2 been able to perform on commercial humanoid robots?

    Option: Swimming and diving
    Option: Baking and cooking
    Option: Walking, crouching, dancing, and interacting with humans
    Option: Driving and flying

6. What does the advancement in robotics discussed in the text open up for robots?

    Option: More sleep time
    Option: A wider range of capabilities by coordinating their limbs and joints effectively
    Option: Higher intelligence than humans

Option: Telepathic communication

True-False

7. The AI system developed by scientists at the University of California, San Diego, is called ExBody1.

8. Robots learn human movements by analyzing data from social media posts.

9. ExBody2 has not been tested on commercial humanoid robots yet.

10. The key to the robot mimicking human movements is a database of human movements from motion capture recordings.

11. The AI system replicates successful human movements on robotic platforms using reinforcement learning.

12. Advancements in robotics do not offer new possibilities for robots to have a wider range of capabilities.

Gap-Fill

15. Scientists at the University of California, San Diego, have developed an AI system called

_____ that teaches robots to mimic human movements in a more lifelike manner.

16. ExBody2 has already been tested on commercial humanoid robots, showcasing its ability to perform

tasks like _____

17. Using reinforcement learning, the AI system can analyze successful movements and then

_____ them on robotic platforms.

18. The advancement in robotics opens up new possibilities for robots to have a wider range of capabilities

by coordinating their limbs and _____ effectively.

Answer

Multiple Choice: 1. ExBody2 2. Database of human movements from motion capture recordings 3. By training the AI system on human movement data

4. Reinforcement learning 5. Walking, crouching, dancing, and interacting with humans 6. A wider range of capabilities by coordinating their limbs and joints effectively

True-False: 7. False 8. False 9. False 10. True 11. True 12. False

Gap-Fill: 15. 2012 16. walking 17. replicate 18. joints

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which term refers to behavior that is selfless and aimed at benefiting others?

   Option: Altruism
   Option: Deception
   Option: Naivety
   Option: Conformity

2. Which term describes the ability to have a significant effect on individuals or events?

   Option: Influential
   Option: Original
   Option: Ambiguity
   Option: Rewards

3. What technology involves the identification of individuals based on their unique biological characteristics?

   Option: Biometrics
   Option: Simulation
   Option: Electrodes
   Option: Mandatory

4. Which term indicates having the ability or capacity to achieve a particular outcome?

   Option: Capable
   Option: Naivety
   Option: Maneuvering
   Option: Decode

5. Which types of stores primarily sell food and household products?

   Option: Supermarkets
   Option: Affiliate
   Option: Interact
   Option: Paralysis

6. Which term refers to situations that are unclear or open to more than one interpretation?

   Option: Ambiguity

Option: Strategies
Option: Rewards
Option: Conformity

7. What motivators are given in return for performing a certain action or task?

Option: Rewards
Option: Amidst
Option: Decode
Option: Lifelike

8. Which term is used to describe the process of converting coded information into a readable format?

Option: Decode
Option: Capable
Option: Electrodes
Option: Authentication

9. What are used to pick up electrical signals and facilitate communication between the brain and external devices?

Option: Electrodes
Option: Interface
Option: Simulation
Option: Mandatory

10. Which term indicates something that is required or compulsory?

Option: Mandatory
Option: Simulation
Option: Identifications
Option: Authentication

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. _____ involves adjusting one's behavior to match the attitudes or actions of a group.

12. Students learn better when they _____ with the material actively rather than

passively.

13. Developing effective study _____ can greatly improve academic performance.

14. High-quality CGI in movies makes animated characters appear more _____ .

15. Biometric security systems use unique physical traits for user _____ .

16. Two-factor _____ provides an additional layer of security to verify a user's identity.

17. Social media influencers can be highly _____ in shaping consumer behavior.

18. Modern smartphones have advanced features and _____ that were unimaginable a

decade ago.

19. Creating an _____ piece of art requires a unique perspective and creative vision.

20. Positive _____ is a key concept in behavioral psychology for encouraging desired

behaviors.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The magician used sleight of hand to trick the audience into believing the coin disappeared.
22. Due to her lack of experience she fell for the dishonest sales pitch.
23. The contract was written in such a vague manner that its terms were open to interpretation.
24. The peaceful garden provided a serene environment amidst the bustling city.
25. The local store decided to with a national chain to expand its reach.
26. Pilots train using flight to practice emergency procedures in a safe environment.
27. The skilled driver showcased advanced techniques to navigate the obstacle course.
28. Cryptographers work to encrypted messages without the proper key.
29. Airport security requires photo to confirm passengers' identities.
30. Many modern smartphones utilize like fingerprints or facial recognition for security access.

Answer

Multiple Choice: 1. Altruism 2. Influential 3. Biometrics 4. Capable 5. Supermarkets 6. Ambiguity 7. Rewards 8. Decode

9. Electrodes 10. Mandatory
Gap-Fill: 11. Conformity 12. Interact 13. Strategies 14. Lifelike 15. Identification 16. Authentication
17. Influential 18. Capabilities 19. Original 20. Reinforcement
Matching sentence: 1. Deception 2. Naivety 3. Ambiguity 4. Amidst 5. Affiliate 6. Simulation 7. Maneuvering
8. Decode 9. Identification 10. Biometrics

CATEGORY

1. Sci/Tech - LEVEL3

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