Paralyzed Man Controls Drone with Mind Implant – Flight Achieved!

Description

A man with paralysis had electrodes put in his brain that let him steer a virtual drone by only thinking about moving his fingers. A clever AI system interprets his brain signals and uses them to control the drone in a computer simulation.

In recent years, brain-computer interface (BCI) research has advanced, helping people with paralysis direct a computer mouse and speak through imagining writing. But it struggles with more complex tasks with multiple inputs—until now.

Matthew Willsey, from the University of Michigan, and his team developed a program that allows a user to trigger four separate signals by simply thinking about moving their fingers and thumb.

This technology was tested on a man with tetraplegia, who had a BCI with 192 electrodes implanted in the part of his brain that controls hand movement.

An AI model decoded the signals from the electrodes, each representing different finger motions. Through training sessions, the man learned to control the drone in the simulation by thought alone, maneuvering it skillfully through obstacles.

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While impressive, Willsey stresses there is more work needed to make BCIs reliable for intricate tasks. AI must be trained to understand each user's signals, and this training needs to be repeated as time passes.

Topics: Brain-Computer Interface, Artificial Intelligence, Paralysis, Technology Innovation

Vocabulary List:

1. **Paralysis** /pəˈræl.ɪ.sɪs/ (noun): A loss of the ability to move or feel in part or most of the body.
2. **Electrodes** /ɪˈlɛk.trəʊdz/ (noun): Conductors through which electricity enters or leaves an object.
3. **Interface** /ˈɪn.tə.feɪs/ (noun): A point where two systems subjects organizations etc. meet and interact.
4. **Simulation** /ˌsɪm.jəˈleɪ.ʃən/ (noun): The act of imitating the operation of a real-world process or system.
5. **Maneuvering** /məˈnuː.vər.ɪŋ/ (verb): To move skillfully or carefully.
6. **Decode** /diːˈkoʊd/ (verb): To convert (a coded message) into intelligible language.

Comprehension Questions

Multiple Choice

1. What technology was used to allow a man with paralysis to steer a virtual drone by thinking about moving his fingers?

Option: Brain-Machine Interface
Option: Virtual Reality
Option: Artificial Intelligence
Option: Computer Mouse

2. How many signals could the user trigger by thinking about moving their fingers and thumb?

Option: Three
Option: Four
Option: Five
Option: Six

3. Where were the 192 electrodes implanted in the man with tetraplegia?

Option: Spinal Cord
Option: Brain
Option: Arm Muscles
Option: Leg Muscles

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4. What was the role of AI in the technology developed by Matthew Willsey?

Option: Decoding signals from the electrodes
Option: Controlling the drone manually
Option: Creating obstacles in the simulation
Option: Recording brain waves

5. What aspect of BCIs does Willsey emphasize needs more work?

Option: Understanding user signals
Option: Controlling drones
Option: Training sessions
Option: Adding more electrodes

6. What is the focus of Willsey and his team's research?

Option: Virtual Reality
Option: Mental Health
Option: Brain-Computer Interface
Option: Robotics

True-False

7. BCI research has mainly been successful in complex tasks with multiple inputs.

8. The man with tetraplegia controlled the drone in the physical world, not in a simulation.

9. AI needs to be retrained to understand individual user signals as time progresses.

10. BCIs are currently reliable for intricate tasks according to Matthew Willsey.

11. Matthew Willsey is from the University of California.

12. The man with tetraplegia had electrodes implanted in his spinal cord.

Gap-Fill

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13. The man with tetraplegia had a BCI with _____ electrodes implanted in his brain.

14. The technology allows a user to trigger _____ separate signals by thinking about moving their fingers and thumb.

15. AI must be trained to understand each user's signals, and this training needs to be repeated as _____ passes.

16. Matthew Willsey and his team developed a program that allows a user to trigger four separate signals by simply thinking about moving their fingers and _____.

17. The AI model decoded signals from the electrodes, each representing different finger _____.

18. BCIs have been successful in helping people with paralysis direct a computer mouse and _____ through imagining writing.

Answer

Multiple Choice: 1. Brain-Machine Interface 2. Four 3. Brain 4. Decoding signals from the electrodes 5. Understanding user signals 6. Brain-Computer Interface
True-False: 7. False 8. False 9. True 10. False 11. False 12. False
Gap-Fill: 13. 192 14. four 15. time 16. thumb 17. motions 18. speak

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?

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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

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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.

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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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