



New Complexity Theory Emerges for Quantum Era

Description

Computer science is about inputs and outputs. For example, when you multiply two numbers on a calculator, you enter the numbers. Then, the screen shows the answer. Some problems, like breaking a number into prime factors, can be harder. But they also follow the same basic idea. Computers change numbers, usually written in 0s and 1s, into outputs.

Researchers study why some problems are harder for computers to solve. They found that some tasks, like the prime factor problem, are easier for quantum computers. Quantum computers use the rules of quantum physics.

For 30 years, researchers have looked at problems where quantum computers are better. But they want to study more problems that do not use normal inputs and outputs. Henry Yuen is interested in these problems. He wants to find out how to understand quantum inputs and outputs.

Yuen is a professor at Columbia University. He wants to create a new theory for these unique problems. He grew up in a restaurant and learned computer programming to make video games. This led him to study quantum computing in college.

Vocabulary List:

1. **inputs** /'ɪn.pʊts/ (noun): Data or signals that are entered into a system for processing.
2. **outputs** /'aʊt.pʊts/ (noun): Data or signals produced by a system after processing inputs.
3. **problems** /'prɒb.ləmz/ (noun): Situations or tasks that require a solution or resolution.
4. **quantum** /'kwɒn.təm/ (adjective): Relating to the smallest amounts or units of energy in physics.
5. **theory** /'θɪə.ri/ (noun): A system of ideas intended to explain something based on general principles.
6. **factors** /'faktərz/ (noun): Elements or components that contribute to a particular result or situation.

Comprehension Questions

Multiple Choice

1. What is the basic concept of computer science?

Option: Inputs and outputs



- Option: Only calculations
- Option: Data storage
- Option: Artificial Intelligence

2. Which of the following problems is mentioned as being harder for computers to solve?

- Option: Multiplying numbers
- Option: Breaking a number into prime factors
- Option: Adding numbers
- Option: Sorting data

3. What unique format do computers typically change numbers into?

- Option: Decimals
- Option: Hexadecimal
- Option: 0s and 1s
- Option: Alphanumeric

4. Who is interested in understanding quantum inputs and outputs?

- Option: Albert Einstein
- Option: Henry Yuen
- Option: Stephen Hawking
- Option: Isaac Newton

5. What type of computers are found to be better at certain tasks?

- Option: Classical computers
- Option: Quantum computers
- Option: Supercomputers
- Option: Personal computers

6. Where does Henry Yuen work as a professor?

- Option: Harvard University
- Option: Stanford University
- Option: Columbia University
- Option: MIT

True-False

7. Quantum computers follow the rules of classical physics.



8. Henry Yuen has been researching quantum computing for over 30 years.
9. Researchers are interested in problems that do not use normal inputs and outputs.
10. Computers primarily use letters to represent numbers.
11. Yuen has a background in programming video games.
12. The prime factor problem is easier for classical computers.

Gap-Fill

13. Computer science involves the concept of _____ and outputs.
14. Researchers have studied problems where _____ computers are better.
15. Henry Yuen is a professor at _____ University.
16. Computers change numbers into _____, usually written in 0s and 1s.
17. Henry Yuen grew up in a _____.
18. Yuen wants to create a new _____ for unique problems.

Answer

Multiple Choice: 1. Inputs and outputs 2. Breaking a number into prime factors 3. 0s and 1s 4. Henry Yuen 5. Quantum computers 6. Columbia University

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

Gap-Fill: 13. inputs 14. quantum 15. Columbia 16. outputs 17. restaurant 18. theory

Vocabulary quizzes

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

1. What field of study does quantum theory primarily belong to?
Option: Biology



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- Option: Physics
Option: Chemistry
Option: Mathematics
2. Which of the following is a type of radiation?
Option: Alpha
Option: Osmosis
Option: Diffusion
Option: Convection
3. What factor primarily influences fertility in species?
Option: Temperature
Option: Nutrition
Option: Habitat
Option: All of the above
4. What environment is characterized by a condition of weightlessness?
Option: High altitude
Option: Desert
Option: Underwater
Option: Microgravity
5. Which of the following is critical for the development of embryos?
Option: Nutrient supply
Option: Temperature regulation
Option: Hormonal balance
Option: All of the above
6. Which of the following defines a species?
Option: Ability to adapt
Option: Organisms that can interbreed
Option: Physiological characteristics
Option: All of the above
7. What do fossils primarily provide evidence for?
Option: Extinct species
Option: Climate change
Option: Geological formations
Option: Live specimens
8. In systems theory feedback is used to control what?
Option: Inputs
Option: Outputs



Option: Both inputs and outputs

Option: None of the above

9. What process involves combining multiple elements to create a new compound?

Option: Decomposition

Option: Synthesis

Option: Metabolism

Option: Respiration

10. What term describes the act of stopping something from progressing?

Option: Enable

Option: Facilitate

Option: Block

Option: Encourage

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

11. Quantum _____ explains the behavior of matter at atomic and subatomic levels.

12. Scientific experiments conducted in _____ environments often yield different results than those on Earth.

13. Exposure to high levels of _____ can be harmful to living organisms.

14. Nutrition environmental conditions and hormones all affect reproductive _____ in organisms.

15. Early _____ is crucial in determining the future health of an organism.

16. Every _____ has unique adaptations that allow it to thrive in its environment.

17. _____ play a crucial role in plant population control and ecosystem balance.

18. Paleontologists study _____ to understand the history of life on Earth.

19. Constructive _____ can significantly improve research outcomes and development processes.



20. _____ often collaborate to expand the knowledge base in various scientific fields.

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

21. In a feedback system inputs are critical for generating appropriate responses.
22. Outputs represent the results produced by a system after processing inputs.
23. The scientist made a groundbreaking discovery that changed the understanding of genetics.
24. Addressing environmental problems requires innovative and collaborative efforts.
25. Scientific models are used to simulate and predict complex phenomena.
26. Authentic research findings are essential for advancing scientific knowledge.
27. Synthetic materials have transformed industries by providing cost-effective alternatives.
28. A filter is used to separate unwanted materials or components from a mixture.
29. Certain chemicals can block the process of photosynthesis in plants.
30. Creative solutions are necessary to tackle complex challenges faced by society.

Answer

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Warning: Undefined array key "answer" in `/home/u750883576/domains/esl-news.com/public_html/wp-content/plugins/gpt-post-quiz/includes/admin/forms/gpoq-post-pdf-questions.php` on line 531

Warning: Undefined array key "answer" in `/home/u750883576/domains/esl-news.com/public_html/wp-content/plugins/gpt-post-quiz/includes/admin/forms/gpoq-post-pdf-questions.php` on line 531

Warning: Undefined array key "answer" in `/home/u750883576/domains/esl-news.com/public_html/wp-content/plugins/gpt-post-quiz/includes/admin/forms/gpoq-post-pdf-questions.php` on line



531

Warning: Undefined array key "answer" in `/home/u750883576/domains/esl-news.com/public_html/wp-content/plugins/gpt-post-quiz/includes/admin/forms/gpoq-post-pdf-questions.php` on line **531**

Warning: Undefined array key "answer" in `/home/u750883576/domains/esl-news.com/public_html/wp-content/plugins/gpt-post-quiz/includes/admin/forms/gpoq-post-pdf-questions.php` on line **531**

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Multiple Choice: 1. Physics 2. Alpha 3. All of the above 4. Microgravity 5. All of the above 6. Organisms that can interbreed 7. Extinct species 8. Both inputs and outputs 9. Synthesis 10. Block

Gap-Fill: 11. theory 12. microgravity 13. radiation 14. fertility 15. development 16. species 17. Herbivores 18. fossils 19. feedback 20. Researchers

Matching sentence: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

CATEGORY

1. Sci/Tech - LEVEL1

POST TAG

1. complexity theory
2. ESL learning
3. esl news
4. Level 1
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