



21st Century  
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# Programming pain

**Spencer Liu**

hashtag 话题

**#日本研发能感知疼痛的机器人#**

阅读248.7万 讨论430

**“Japanese Scientists Create A Robot That Can ‘Feel’ Pain”**





Researchers are teaching robots to feel pain to protect them and us. CFP

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词数 378 测试见IV版  
建议阅读时间 5分钟

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Think about how many injuries you would receive if you couldn't feel pain. Even though pain hurts, it helps us to avoid danger and treat our wounds. The same will be true for robots. As a greater number of people work closely with robots, the robots must behave in a safer manner. Kuehn believes that by protecting robots from damage, they'll be protecting people as well. Damage to robots - if left unseen - could lead to workplace accidents.

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tions and expressions on a robot's face. Asada believes that these systems could eventually lead to robots seeing the pain on human faces, an important skill for robots designed to care for elderly people, for example.

Antonio Damasio, a *neuroscientist* (神经学家) at the University of Southern California, argues that programming robots with a sense of pain (or something similar) may cause an artificial sense of feeling to develop. A robot with touch sensors that can *detect* (探测) pain is “along the lines of having a robot, for example, that smiles when you talk to it”, Damasio said. “It's a device for communication of the machine to a human.”

Damasio is quick to point out that this communication is an interesting development, but “it's not the same thing” as a robot truly feeling and expressing emotions or pain. If one day, robots could actually feel as humans do, Damasio has a suggestion for the number one rule for robots: Feel good.

BY MATT SADOWSKI,  
21ST CENTURY TEENS STAFF

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## Choose the best answer:

**1. Why would a robot nervous system be beneficial, according to Kuehn?**

- A. It could help robots treat humans' injuries gently.
- B. It could reduce accidents when robots work.
- C. It could teach robots how to find a source of danger.
- D. It could let robots respond more quickly to instructions.

**2. What could the sensors developed by Asada and his colleagues be used for in the future?**

- A. Collecting various types of touch signals.
- B. Turning human emotions into touch signals.
- C. Helping robots recognize the pain on human faces.
- D. Showing robots how to take care of the elderly.

**3. What is Damasio's attitude toward this technology?**

- A. It could promote interaction between humans and robots.
- B. It will eventually allow robots to feel as humans do.
- C. It will be hard to translate the artificial sense of feelings.
- D. It could lead to real human-robot emotional connections.

## Paragraph 1-2

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# Paragraph 3

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# Vocabulary

- **artificial**
- **evade**
- **sensor**
- **neuroscientist**
- **detect**

**Reading strategy 1:[X] guess the meaning based on the context / root & affix  
[O] look up in the English-English dictionary**

- **artificial**
- **evade**  
When we evade from the source of pain, it helps us not get hurt.
- **sensor**
- **neuroscientist**  
neuro+scientist
- **detect**

- **artificial** a.人工的  
made or produced to copy sth natural; not real
- **evade** v.规避  
to escape from sb/sth
- **sensor** n.传感器  
a device that can react to light, heat, pressure, etc. in order to make a machine do sth or show sth
- **neuroscientist** n.神经学家  
a person who studies the science that deals with the structure and function of the brain and the nervous system
- **detect** v.探测
- to discover or notice sth, especially sth that is not easy to see, hear, etc

**Reading strategy 1:[X] guess the meaning based on the context / root & affix**  
**[O] look up in the English-English dictionary**



- Johannes Kuehn



- Minoru Asada



- Antonio Damasio

-  IEEE  
**SPECTRUM**

Reading strategy 2: [X] ignore

[O] search online for further information



- Johannes Kuehn 约翰内斯·库恩
- Leibniz University of Hannover in Germany
- 德国汉诺威市的莱布尼茨大学



- Minoru Asada 浅田稔
- Osaka University in Japan 日本大阪大学



- Antonio Damasio 安东尼奥·达马西奥
- the University of Southern California 南加利福尼亚大学

-  **IEEE SPECTRUM** 科技纵览
- a magazine edited by the Institute of Electrical and Electronics Engineers

**Reading strategy 2: [X] ignore**

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# Paragraph 1

**Reading strategy 3: a. get rid of the unnecessary information  
b. find the key points and rearrange the word order**

**Rearrange the word order:**

**Who? + What did they do? / What opinions did they have?**

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Robots are useful because they never get tired and can't feel pain. Why program robots to feel pain? Some researchers, however, believe it's a good idea.

**Some researchers believe that programming robots to feel pain is a good idea.**

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## Paragraph 2

Researchers from Leibniz University of Hannover in Germany are working to develop an “*artificial* (人工的) robot nervous system to teach robots how to feel pain”, according to IEEE Spectrum. “Pain is a system that protects us,” said Johannes Kuehn, one of the researchers. “When we *evade* (规避) from the source of pain, it helps us not get hurt.”

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**Who? + What?**

**Johannes Kuehn and the other researchers are working to develop a nervous system to help robots feel pain and not get hurt.**

**Reading strategy 3: a. get rid of the unnecessary information**

**b. find the key points and rearrange the word order**

# Paragraph 3

Think about how many injuries you would receive if you couldn't feel pain. Even though pain hurts, it helps us to avoid danger and treat our wounds. The same will be true for robots. As a greater number of people work closely with robots, the robots must behave in a safer manner. Kuehn believes that by protecting robots from damage, they'll be protecting people as well. Damage to robots – if left unseen – could lead to workplace accidents.

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**Who? + What?**

**Minoru Asada and his colleagues have made sensors that pick up many types of touch signals and then turn into emotions and expressions on a robot's face.**

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← transitional sentence

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← transitional sentence

**Who? + What?**

← receive



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**Who? + What?**

← **similar to**

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**Who? + What?**

**Damasio points out that this communication is not the same as a robot truly feeling and expressing emotions or pain.**

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**Reading strategy 4: a. locate the sentences quickly by keys words  
b. analyze the sentences(supporting evidence)**

# Paragraph 2-3

Researchers from Leibniz University of Hannover in Germany are working to develop an “artificial (人工的) robot nervous system to teach robots how to feel pain”, according to IEEE Spectrum. “Pain is a system that protects us,” said Johannes Kuehn, one of the researchers. “When we evade (规避) from the source of pain, it helps us not get hurt.”

Think about how many injuries you would receive if you couldn't feel pain. Even though pain hurts, it helps us to avoid danger and treat our wounds. The same will be true for robots. As a greater number of people work closely with robots, the robots must behave in a safer manner. Kuehn believes that by protecting robots from damage, they'll be protecting people as well. Damage to robots – if left unseen – could lead to workplace accidents.

- 1. Why would a robot nervous system be beneficial, according to Kuehn?**
  - A. It could help robots treat humans' injuries gently.
  - B. It could reduce accidents when robots work.**
  - C. It could teach robots how to find a source of danger.
  - D. It could let robots respond more quickly to instructions.

**Reading strategy 4: a. locate the sentences quickly by keys words  
b. analyze the sentences(supporting evidence)**

# Paragraph 4

Rather than feel pain, some robots are designed to show pain or see it in others. Minoru Asada, an engineer at Osaka University in Japan, and his colleagues have made *sensors* (传感器) that pick up many types of touch signals. These touch and pain signals can turn into emotions and expressions on a robot's face. Asada believes that these systems could eventually lead to robots seeing the pain on human faces, an important skill for robots designed to care for elderly people, for example.

- 2. What could the sensors developed by Asada and his colleagues be used for in the future?**
- A. Collecting various types of touch signals.
  - B. Turning human emotions into touch signals.
  - C. Helping robots recognize the pain on human faces.**
  - D. Showing robots how to take care of the elderly.

**Reading strategy 4: a. locate the sentences quickly by keys words  
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# Paragraph 5-6

Antonio Damasio, a *neuroscientist* (神经学家) at the University of Southern California, argues that programming robots with a sense of pain (or something similar) may cause an artificial sense of feeling to develop. A robot with touch sensors that can *detect* (探测) pain is “along the lines of having a robot, for example, that smiles when you talk to it”, Damasio said. “It’s a device for communication of the machine to a human.”



Damasio is quick to point out that this communication is an interesting development, but “it’s not the same thing” as a robot truly feeling and expressing emotions or pain. If one day, robots could actually feel as humans do, Damasio has a suggestion for the number one rule for robots: Feel good.

- 3. What is Damasio’s attitude toward this technology?**
- A. It could promote interaction between humans and robots.**
  - B. It will eventually allow robots to feel as humans do.
  - C. It will be hard to translate the artificial sense of feelings.
  - D. It could lead to real human-robot emotional connections.

**Reading strategy 4: a. locate the sentences quickly by keys words**  
**b. analyze the sentences(supporting evidence)**

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**Reading strategy 4: a. locate the sentences quickly by keys words**  
**b. analyze the sentences(supporting evidence)**

**Reading strategy 1:** [X] guess the meaning based on the context / root & affix  
[O] look up in the English-English dictionary

**Reading strategy 2:** [X] ignore  
[O] search online for further information

**Reading strategy 3:** a. get rid of the unnecessary information  
b. find the key points and rearrange the word order

**Reading strategy 4:** a. locate the sentences quickly by keys words  
b. analyze the sentences(supporting evidence)



KEEP  
CALM

AND

GET  
A HIGH  
SCORE

THANK YOU ~ ~ ~



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