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THE ARTICLE

***Computer translates brainwaves into sentences***

Scientists may soon be able to interpret what someone is saying simply   
by analysing their brainwaves as they speak. This revolutionary advance   
in neuroscience would help millions of people who suffer from   
communication problems and neurological disorders. The scientists   
developed a form of artificial intelligence that can decode brainwaves and   
translate them into text. Algorithms take the brain activity created as a   
person speaks and translates it in real time into sentences on a screen.   
The scientists are from the University of California, San Francisco. They   
say their algorithms have a 97 per cent translation accuracy rate but are   
working hard to improve on this.

The scientists say they are at the early stages of being able to machine-  
translate everything someone says. The software used in their   
experiments matched features of speech that were repeated frequently to   
parts and shapes of the mouth. These included elements of English   
speech such as vowels, consonants and commands. The experiments   
were limited to around 40 short and simply-constructed spoken   
sentences. The scientists said: "Although we should like the decoder to   
learn and exploit the regularities of the language, it remains to show how   
many data would be required to expand from our tiny languages to a   
more general form of English."

Sources: [https://www.bbc.com/news/science-environment-52094111](https://www.bbc.com/news/science-environment-52094111/https://www.bbc.com/news/science-environment-52094111/https://www.bbc.com/news/science-environment-52094111/)

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activity-into-text

[https://www.inverse.com/innovation/brain-to-text](https://www.inverse.com/innovation/brain-to-text/https://www.inverse.com/innovation/brain-to-text/https://www.inverse.com/innovation/brain-to-text/)

VOCABULARY MATCHING

Paragraph 1

1. interpret

2. advance

3. neuroscience

4. disorder

5. decode

6. algorithms

7. accuracy

Paragraph 2

8. feature

9. frequently

10. element

11. vowel

12. consonant

13. exploit

14. regularities

a. A development or improvement.

b. Convert a scrambled message into

understandable language.

c. A disease or abnormal physical or mental

condition.

d. The studies that deal with the structure or

function of the nervous system and brain.

e. Translate the words of a person speaking a

different language.

f. The quality or state of being correct or

precise.

g. A process or set of rules to be followed in

calculations or other problem-solving operations.

h. Make full use of and get benefit from.

i. A distinctive quality, characteristic or aspect

of something.

j. A basic sound in speech made by the lips or

tongue blocking the breath.

k. Things that are constant or the same.

l. A part (often essential) of something.

m. A letter representing a sound, such as a, e,   
 i, o, u.

n. Regularly or habitually; often.

BEFORE READING

1. TRUE / FALSE: Read the headline. Guess if A-H below are true (T) or false (F).

a. Scientists can translate what someone is saying in different languages. T / F

b. New technology would help people with neurological problems. T / F

c. Algorithms could translate brainwaves into written text. T / F

d. Scientists say the algorithms are 97% accurate. T / F

e. Scientists are nearing the end of their testing. T / F

f. Software matched features of speech to the shape of a mouth. T / F

g. Scientists analysed over 40 thousand short sentences. T / F

h. Scientists said they needed to reduce the data they have. T / F

2. SYNONYM MATCH:

Match the following synonyms. The words in bold are from the news article.

1. simply a. components

2. revolutionary b. precision

3. disorders c. utilize

4. translates d. illnesses

5. accuracy e. cutting-edge

6. stages f. corresponded

7. matched g. phases

8. elements h. just

9. exploit i. broaden

10. expand j. converts

3. PHRASE MATCH: (Sometimes more than one choice is possible.)

1. analysing their brainwaves a. accuracy rate

2. communication problems and b. frequently

3. translates it in real c. spoken sentences

4. algorithms have a 97 per cent translation d. neurological disorders

5. working hard to improve e. the early stages

6. scientists say they are at f. as they speak

7. features of speech that were repeated g. form of English

8. elements of English speech such as h. on this

9. 40 short and simply-constructed i. vowels

10. a more general j. time

GAP FILL

Scientists may soon be able to (1) \_\_interpret\_\_ what someone is   
saying simply by analysing their brainwaves as they speak. This   
revolutionary (2) \_\_advance\_\_ in neuroscience would help   
millions of people who (3) \_\_suffer\_\_ from communication   
problems and neurological (4) \_disorders\_\_\_. The scientists   
developed a form of artificial intelligence that can decode   
brainwaves and translate them into (5) \_\_\_sentences\_\_\_. Algorithms   
take the brain activity created as a person speaks and translates it   
in (6) \_\_real\_\_ time into sentences on a screen. The   
scientists are from the University of California, San Francisco.   
They say their (7) \_\_algorithms\_\_\_ have a 97 per cent translation   
accuracy (8) \_\_\_rate\_\_\_\_ but are working hard to improve on   
this.

The scientists say they are at the early (9) \_\_\_\_stages\_\_\_ of being able to machine-translate everything someone says. The software used in their experiments (10) \_\_\_matched\_\_ features of speech that were repeated frequently to parts and (11) \_\_shapes\_\_\_\_\_\_ of the mouth. These included elements of English speech such as vowels, (12) \_ \_\_ and commands. The experiments were limited to around 40 short and simply-constructed spoken

(13) \_\_\_\_sentences\_\_\_\_. The scientists said: "Although we should like   
the decoder to learn and (14) \_\_\_form\_\_ the regularities of the   
language, it remains to show how many (15) \_\_\_\_\_data\_\_\_\_\_\_\_ would   
be required to expand from our tiny languages to a more general

(16) \_\_exploit\_\_ of English."

*~~advance~~*

*text*

*~~rate~~*

*~~interpret~~*

*~~disorders~~*   
*~~algorithms~~*   
*~~real~~*

*~~suffer~~*

*~~exploit~~*

*~~matched~~*   
*~~consonants~~*   
*~~stages~~*

*~~data~~*

*~~sentences~~*

*~~form~~*

*~~shapes~~*

COMPREHENSION QUESTIONS

1. Who may be able to interpret what someone is saying?

Scientists

2. What kind of disorders might the software help?

Neurological disorders

3. What translates brain activity as a person speaks?

Algorithms

4. When does the software translate brainwaves?

In real time

5. What is the accuracy rate of the scientists' algorithms?

97%

6. What stage are the scientists at in the testing?

The early stages

7. What was matched to parts and shapes of the mouth?

Features of speech

8. How many short sentences were used in the experiments?

Forty

9. What do scientists want to exploit regularities of language?

Regularities

10. What must scientists expand to get to a more general from of English?

Data

9

MULTIPLE CHOICE - QUIZ

1) Who may be able to interpret 6) What stage are the scientists at in

what someone is saying? the testing?

a) interpreters a) the early stages

b) scientists b) stage two

c) translators c) the final stage

d) people with brainwaves d) stage 17

2) What kind of disorders might the 7) What was matched to parts and

software help? shapes of the mouth?

a) software disorders a) a grammar book

b) major disorders b) identity software

c) software disorders c) features of speech

d) neurological disorders d) people

3) What translates brain activity as a 8) How many short sentences were

person speaks? used in the experiments?

a) Google translate a) 40

b) a mobile phone b) 36

c) algorithms c) 30

d) a website d) 24

4) When does the software translate 9) What do scientists want to use to

brainwaves? exploit regularities of language?

a) in real time a) other languages

b) 10 minutes after a person speaks b) people's ability to learn

c) next year c) grammar books

d) in 2021 d) their decoder

5) What is the accuracy rate of the 10) What must scientists expand to

scientists' algorithms? get to a more general from of

a) 3% English?

b) 97% a) brain power

c) 50% b) vocabularies

d) 40% c) data

d) muscles