

## Computer translates brainwaves into sentences

3rd April, 2020



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: [bbc.com](http://bbc.com) / [theguardian.com](http://theguardian.com) / [inverse.com](http://inverse.com)

### Writing

A technology that means we don't need to learn new languages is great. Discuss.

### Chat

Talk about these words from the article.

scientists / interpret / brainwaves / speak / communication / intelligence / translation / early stages / software / experiments / mouth / vowels / language / data / English

### True / False

- 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

### Synonym Match

(The words in **bold** are from the news article.)

- |                         |                 |
|-------------------------|-----------------|
| 1. <b>simply</b>        | a. components   |
| 2. <b>revolutionary</b> | b. precision    |
| 3. <b>disorders</b>     | c. utilize      |
| 4. <b>translates</b>    | d. illnesses    |
| 5. <b>accuracy</b>      | e. cutting-edge |
| 6. <b>stages</b>        | f. corresponded |
| 7. <b>matched</b>       | g. phases       |
| 8. <b>elements</b>      | h. just         |
| 9. <b>exploit</b>       | i. broaden      |
| 10. <b>expand</b>       | j. converts     |

### Discussion – Student A

- a) What do you think about what you read?
- b) What do you think is the future of this technology?
- c) Would you like software that instantly translates brainwaves?
- d) Would you learn English if there was real-time translation software?
- e) What is most difficult when speaking English?
- f) Do you think we will need English teachers in the future?
- g) In what other ways could translating brainwaves help us?
- h) What questions would you like to ask the researchers?

## Phrase Match

- |                                              |                           |
|----------------------------------------------|---------------------------|
| 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                   |

## Discussion – Student B

- When was the last time you had a brainwave?
- What do you know about brainwaves?
- What do you know about neuroscience?
- How can we help people with communication problems?
- What communication problems have you had?
- What do you know about artificial intelligence?
- How good are you at translating English into your language?
- How important is accuracy when speaking English?

## Spelling

- tiprernet what someone is saying
- revolutionary advance in unosiceercne
- problems and neurological ioddrrsers
- loatirhgms take the brain activity
- nsnetcees on a screen
- translation ucarccay rate
- matched etfruaes of speech
- repeated rqfneutely
- vowels, oscanonnts and commands
- simply ontccurtsed
- xlpeoit the regularities of the language
- be gruireed to expand

### Answers – Synonym Match

1. h	2. e	3. d	4. j	5. b
6. g	7. f	8. a	9. c	10. i

## Role Play

### Role A – Vocabulary

You think vocabulary is the most important part of learning a language. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least important of these (and why): spelling, punctuation or grammar.

### Role B – Spelling

You think spelling is the most important part of learning a language. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least important of these (and why): vocabulary, punctuation or grammar.

### Role C – Punctuation

You think punctuation is the most important part of learning a language. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least important of these (and why): spelling, vocabulary or grammar.

### Role D – Grammar

You think grammar is the most important part of learning a language. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least important of these (and why): spelling, punctuation or vocabulary.

## Speaking – Language

Rank these with your partner. Put the most important things to learn at the top at the top. Change partners often and share your rankings.

- |              |                     |
|--------------|---------------------|
| • vocabulary | • punctuation       |
| • spelling   | • writing sentences |
| • grammar    | • slang             |
| • syllables  | • intonation        |

### Answers – True False

a	F	b	T	c	T	d	T	e	F	f	T	g	F	h	F
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Answers to Phrase Match and Spelling are in the text.