

Researchers find way to target sound to individuals

27th March 2025



The way in which we listen to music and hear sounds has changed over the centuries. Today, we have state-of-the-art, noise-cancelling ear buds that provide the highest quality aural experience. In the near future, we will be able to listen to music in public without

headphones. New technology is being tested that can aim beams of sound at individuals, without people next to them hearing. This means we could be having private conversations in public without others listening in. A team of researchers at Penn State University in the USA developed an innovation called "audio enclaves". The ultrasound waves used for these enclaves cannot be heard en route to the recipient. In addition, the waves can be bent to get around obstacles.

The researchers spoke to the website "The Conversation" about their work. Lead researcher Jiaxin Zhong said: "We essentially created a virtual headset. Someone within an audible enclave can hear something meant only for them, enabling sound and quiet zones." He elaborated on the potential uses of the technology. Museums could provide headphone-free audio guides to visitors. Passengers in a car could listen to music without distracting the driver. Those requiring confidentiality could set up enclaves to ensure their conversations are not overheard. Individuals could also receive personalized ads as we walk through a shopping mall. In addition, audio enclaves could be set up to eliminate noise pollution in busy workplaces.

Sources: theconversation.com / futurism.com / musicradar.com

Writing

We must reduce the amount of noise in the world.

Chat

Talk about these words from the article.

music / sounds / state-of-the-art / ear buds / the near future / conversations / waves / website / quiet zones / technology / museums / personalized ads / noise / pollution

True / False

- 1) The article says we have art-of-the-state ear buds today. T / F
- 2) We could soon be able to listen to music in public without headphones. T / F
- 3) Beamed sound waves will only be heard by the intended listener. T / F
- 4) The new technology can bend sound waves around obstacles. T / F
- 5) The new technology will create "noisy zones". T / F
- 6) Visitors to museums could listen to audio guides without headphones. T / F
- 7) The technology is intended to stop drivers from distracting passengers. T / F
- 8) The new technology could end noise pollution in the workplace. T / F

Synonym Match

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

- | | |
|----------------------------|-----------------|
| 1. state-of-the-art | a. receiver |
| 2. aim | b. simulated |
| 3. innovation | c. customized |
| 4. recipient | d. barriers |
| 5. obstacles | e. point |
| 6. virtual | f. putting off |
| 7. elaborated | g. get rid of |
| 8. distracting | h. cutting edge |
| 9. personalized | i. expanded on |
| 10. eliminate | j. breakthrough |

Discussion – Student A

- a) What do you think about what you read?
- b) Which do you think are better, headphones or ear buds?
- c) Is it better to listen to music without headphones?
- d) What do you think of the idea of 'quiet zones'?
- e) Do you ever use audio guides in museums or sites?
- f) What do you think of the idea of receiving personalized ads in malls?
- g) To what degree are you bothered by noise in public places?
- h) What questions would you like to ask the researchers?

Phrase Match

- | | |
|--|----------------------------|
| 1. changed over | a. get around obstacles |
| 2. state-of-the-art, noise- | b. at individuals |
| 3. aim beams of sound | c. through a shopping mall |
| 4. ultrasound | d. the driver |
| 5. the waves can be bent to | e. waves |
| 6. He elaborated on the potential | f. cancelling ear buds |
| 7. listen to music without distracting | g. overheard |
| 8. ensure their conversations are not | h. in busy workplaces |
| 9. receive personalized ads as we walk | i. the centuries |
| 10. eliminate noise pollution | j. uses of the technology |

Discussion – Student B

- How do you usually listen to music?
- What are the differences between headphones and ear buds?
- How important is sound quality when you listen to music?
- What do you think of the idea of 'audio enclaves'?
- How good is the audio equipment you use?
- How much does hearing other people's music bother you?
- How important is having a conversation without being overheard?
- How much does noise pollution bother you?

Spelling

- changed over the utireescn
- the highest quality ulraa experience
- aim beams of sound at dilivsaidnu
- developed an vtnaniooin
- audio secvneal
- bent to get around stblecaos
- We essentially created a utvarli headset
- He dloaeebtra on the potential uses
- listen to music without tstdrcngaij the driver
- Those requiring clfnioiettandiy
- receive apelseroznid ads
- set up to mnliiaete noise pollution

Answers – Synonym Match

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

Comprehension Questions

Listen to / read the news article. Answer these questions. (Answers are on p. 27 of the 27-page PDF.)

1.	What state-of-the-art things do we use today?
2.	When will we be able to listen to music without headphones?
3.	At what institution do the researchers work?
4.	What is the headphone-less innovation called?
5.	What can the sound waves be bent to get around?
6.	Who did the researchers talk to?
7.	Where could people listen to headphone-free audio guides?
8.	Who might receive fewer distractions because of this technology?
9.	What could we receive as we walk through shopping malls?
10.	Where might the technology be set up to eliminate noise pollution?

Speaking –

Rank these with your partner. Put the best sounds at the top. Change partners often and share your rankings.

- | | |
|------------------|-----------------------|
| • Falling rain | • Alarm clocks |
| • Trains | • A baby's laughter |
| • Birdsong | • A cat meowing |
| • Phones ringing | • An amusement arcade |

Answers – True False

1	F	2	T	3	T	4	T	5	F	6	T	7	F	8	T
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Answers to Phrase Match and Spelling are in the text.