

HARNESSING THE POWER OF AI TO TRANSFORM HEARING HEALTHCARE

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PERCEPTUAL TECHNOLOGIES



2026
CONVENTION
Louisville, KY
June 10-12, 2026

DISCLOSURE

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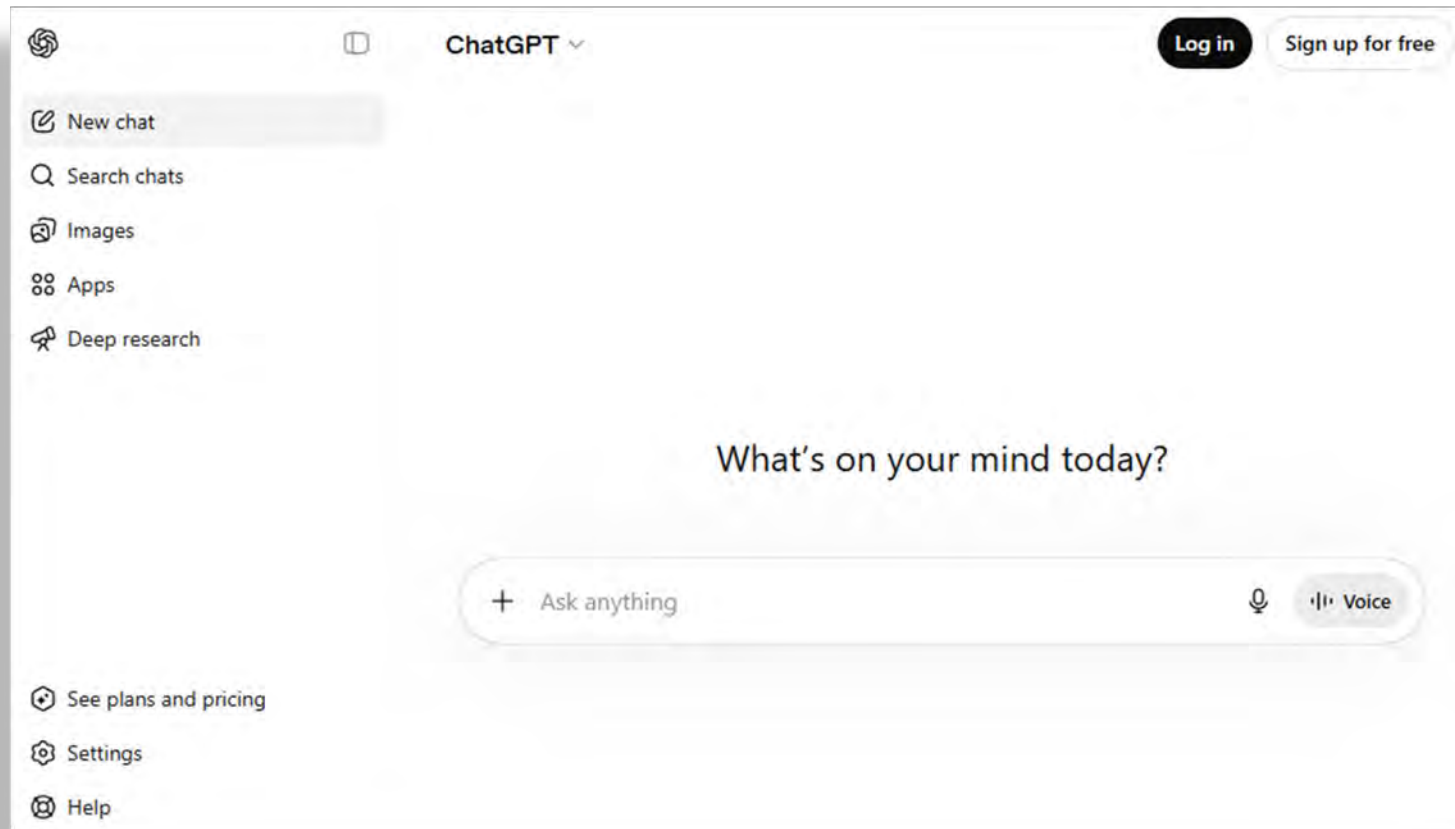
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WHAT IS AI?

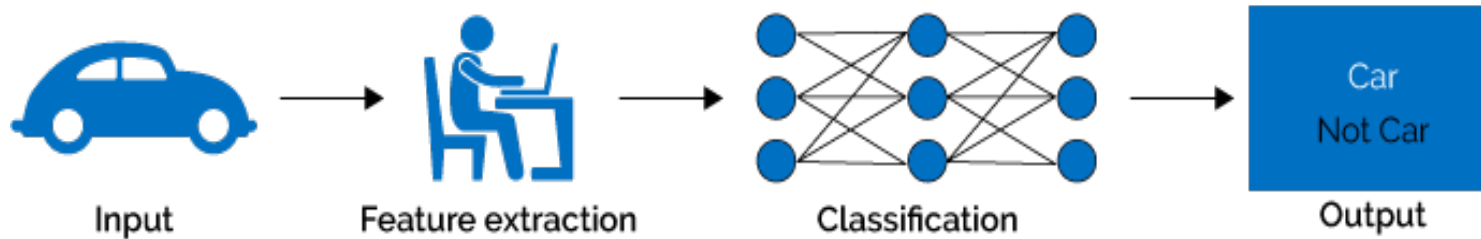


**AI is not just
ChatGPT!**

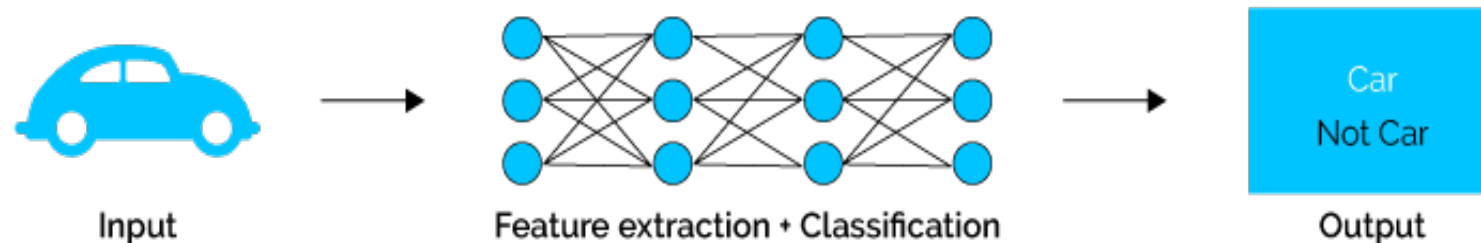
WHAT IS AI?

AI is a tool for identifying patterns in complex data

The old way: make assumptions about key features and patterns



The new way: learn everything from the data



AI Strengths

- Requires few (if any) assumptions
- Requires little (if any) prior knowledge

AI Weaknesses

- Requires 'big' data
- Not necessarily interpretable or trustworthy

HOW CAN AI IMPROVE HEARING HEALTH?

Harnessing the power of artificial intelligence to transform hearing healthcare and research

Nicholas A. Lesica¹✉, Nishchay Mehta^{2,3}, Joseph G. Manjaly^{2,3}, Li Deng^{4,5}, Blake S. Wilson⁶ and Fan-Gang Zeng⁷✉

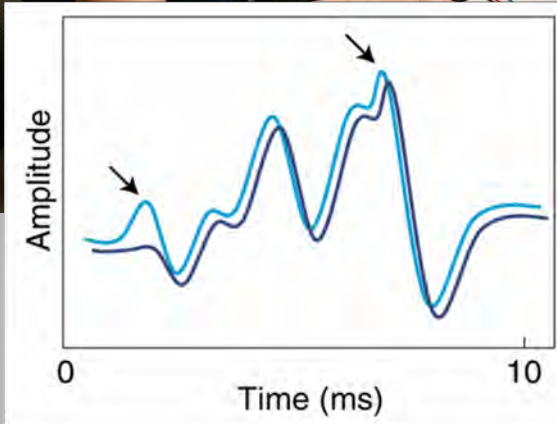


In 2021, we laid out a vision for AI in hearing health ...

How far have we come?

- **Diagnostics**
- **Devices**

AI CAN IMPROVE THE AVAILABILITY AND ACCURACY OF DIAGNOSTICS

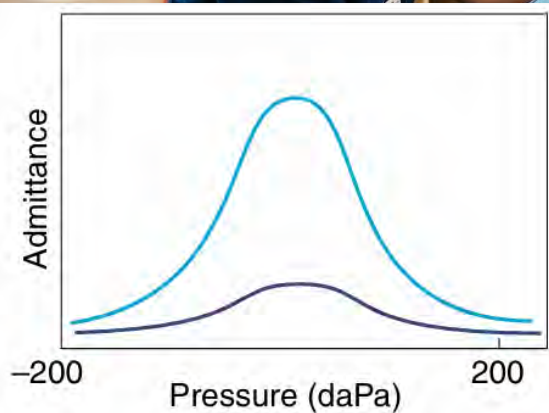


Auditory brainstem response (ABR)

NHS hearing units misdiagnosed thousands of children and 'did nothing'

- Hundreds of children failed to receive proper diagnosis and treatment
- AI can automate or assist in the interpretation of ABR results, increasing accuracy and access

AI CAN IMPROVE THE AVAILABILITY AND ACCURACY OF DIAGNOSTICS



Tympanometry

Stay tuned for Sam's talk!

AI CAN IMPROVE THE AVAILABILITY AND ACCURACY OF DIAGNOSTICS



Speech intelligibility assessment

AI-powered Speech Intelligibility Assessment for Children: A proof-of-concept Study

- Tracking language development is critical for children with HAs and CIs
- AI can provide efficient and objective assessment for monitoring progress and optimizing outcomes

AI CAN IMPROVE THE AVAILABILITY AND ACCURACY OF DIAGNOSTICS



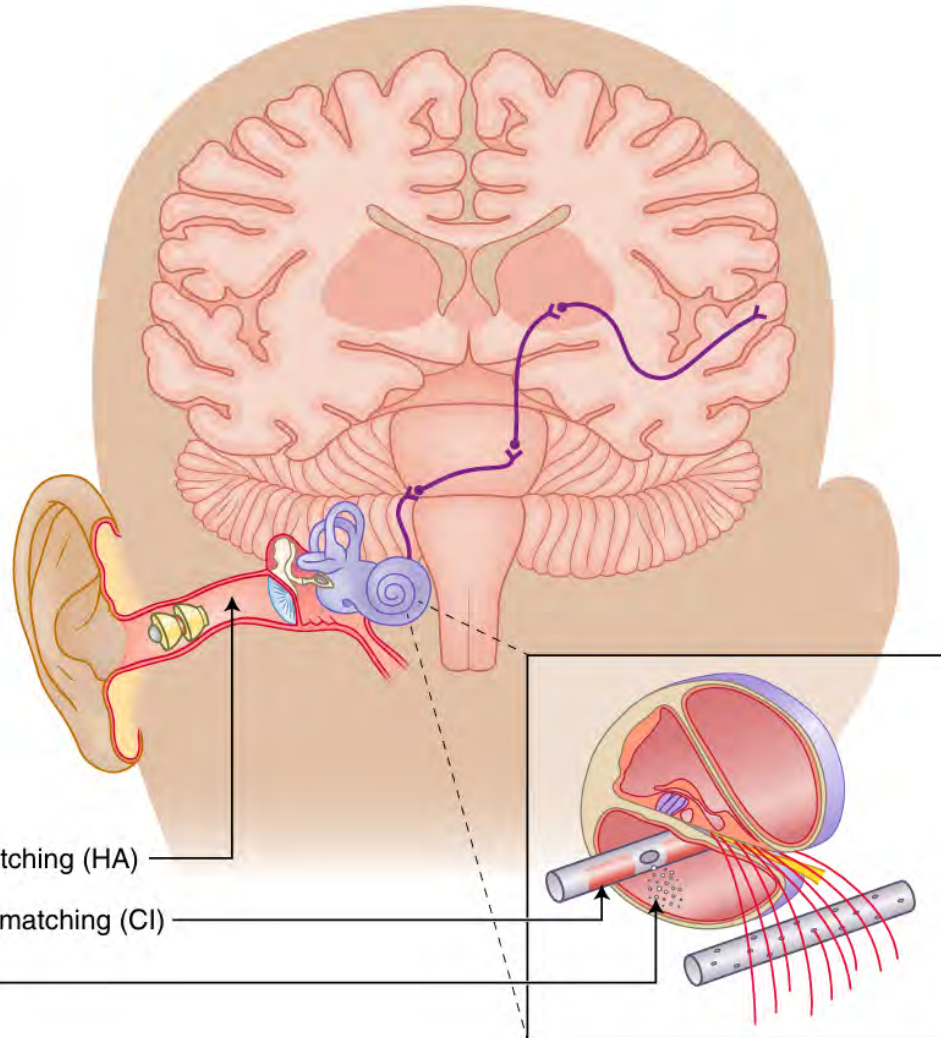
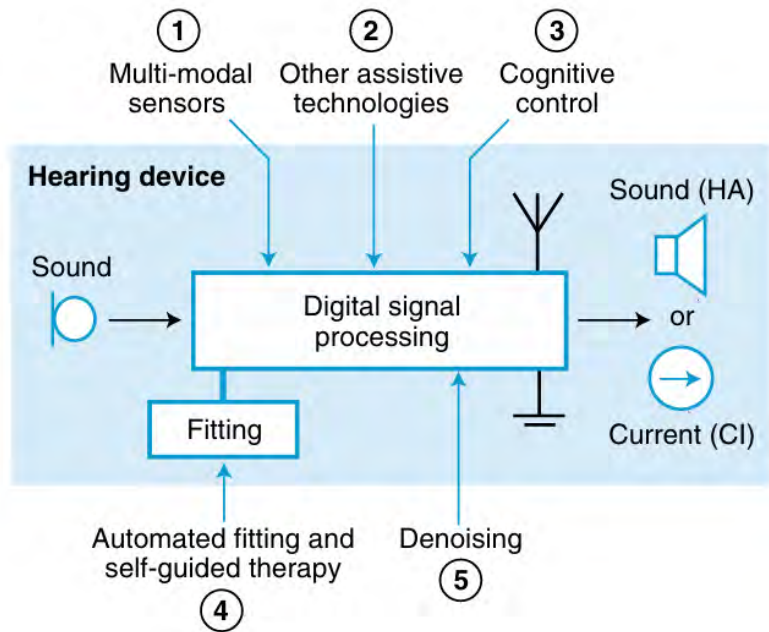
Otoscopy

More from Sam!



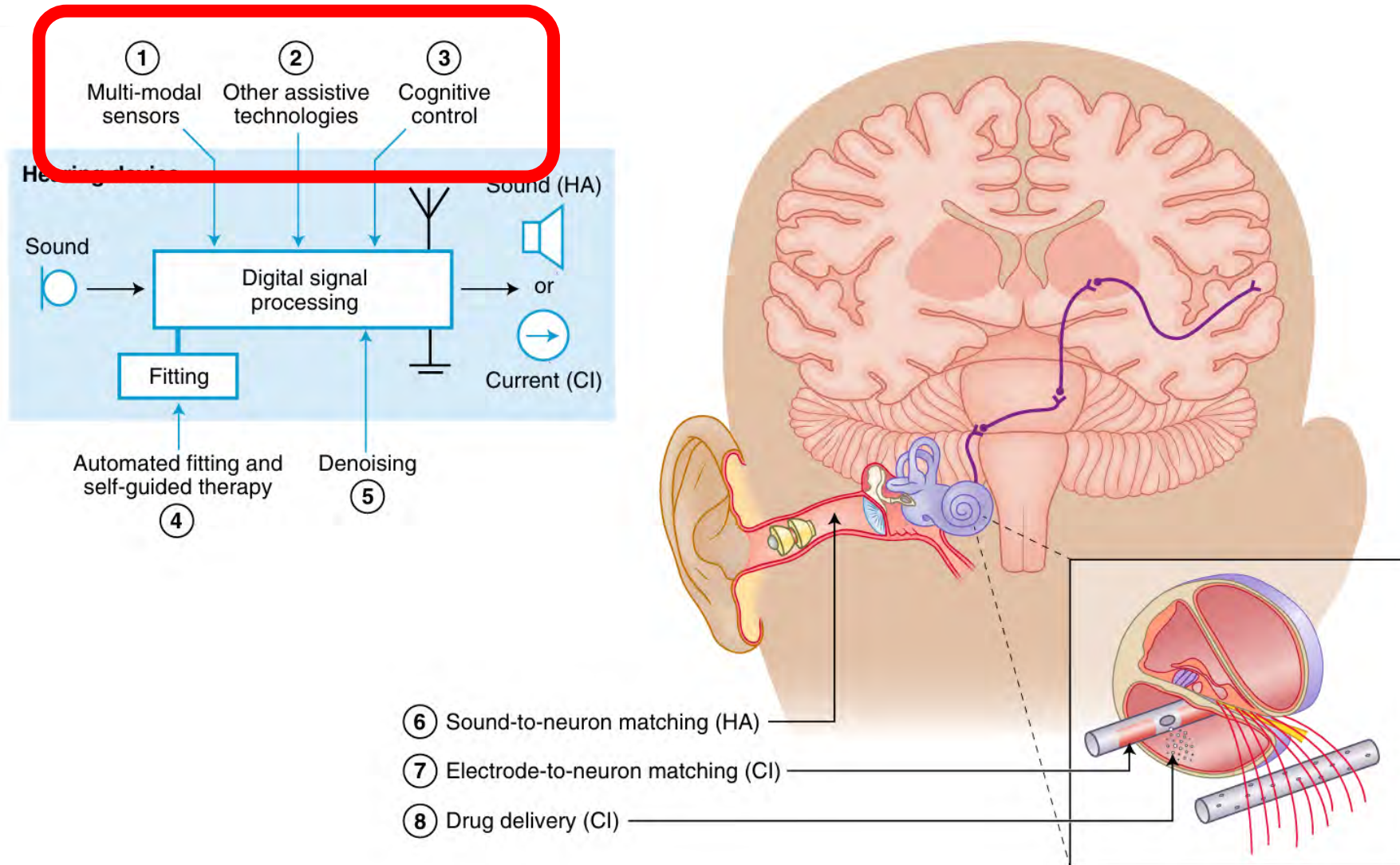
- Smartphone-based tools for remote or automated triage
- Accuracy comparable to in-person assessment
- Access to care in areas w/o hearing health services

AI CAN IMPROVE THE PERFORMANCE OF HEARING AIDS, COCHLEAR IMPLANTS, ETC.

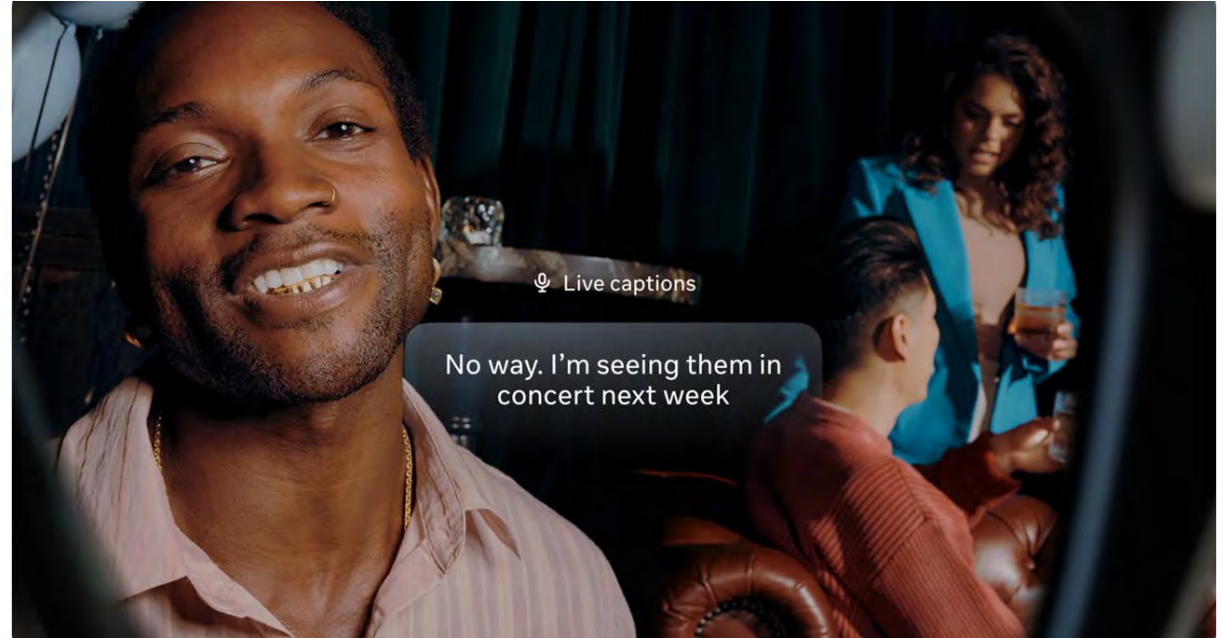


- ⑥ Sound-to-neuron matching (HA)
- ⑦ Electrode-to-neuron matching (CI)
- ⑧ Drug delivery (CI)

AI CAN IMPROVE THE PERFORMANCE OF HEARING AIDS, COCHLEAR IMPLANTS, ETC.

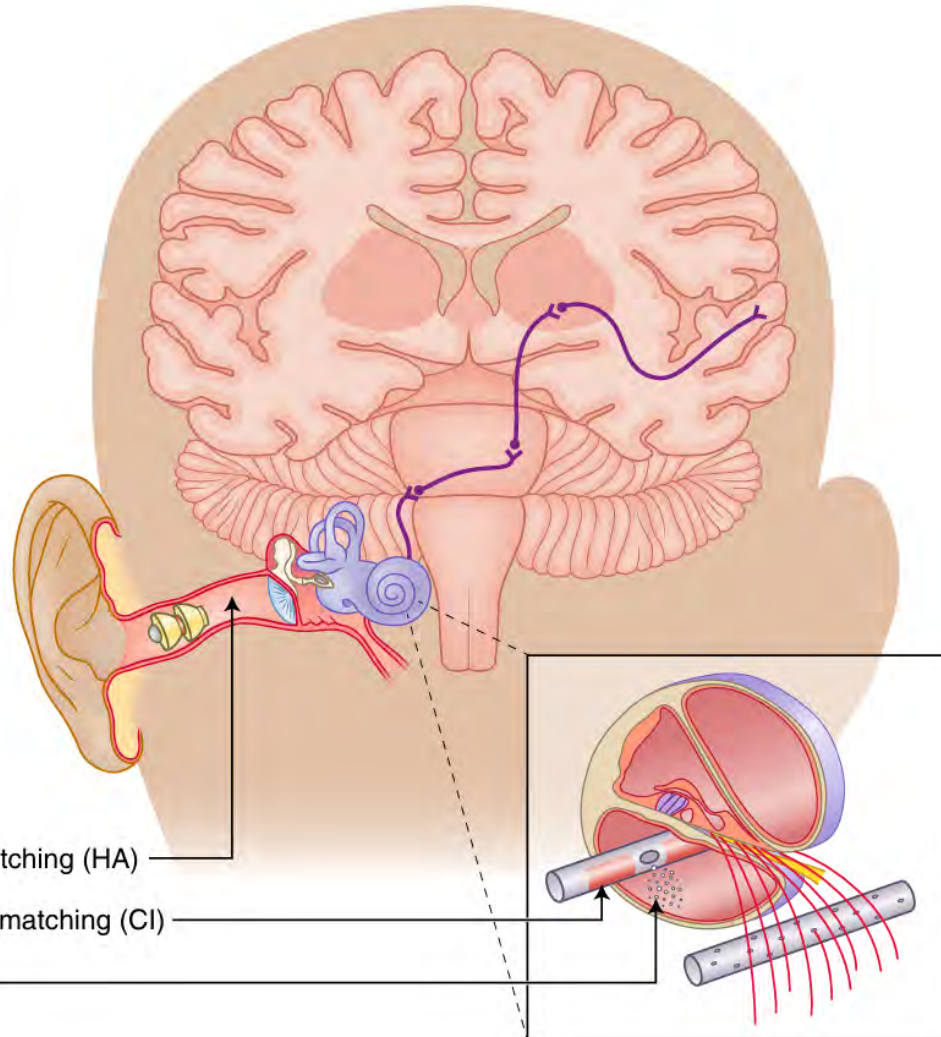
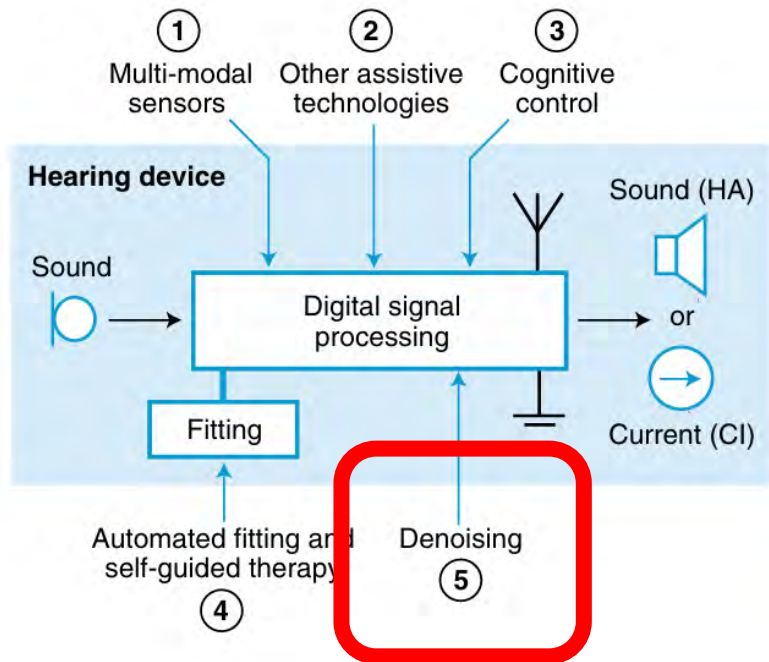


AI CAN IMPROVE THE PERFORMANCE OF HEARING AIDS, COCHLEAR IMPLANTS, ETC.



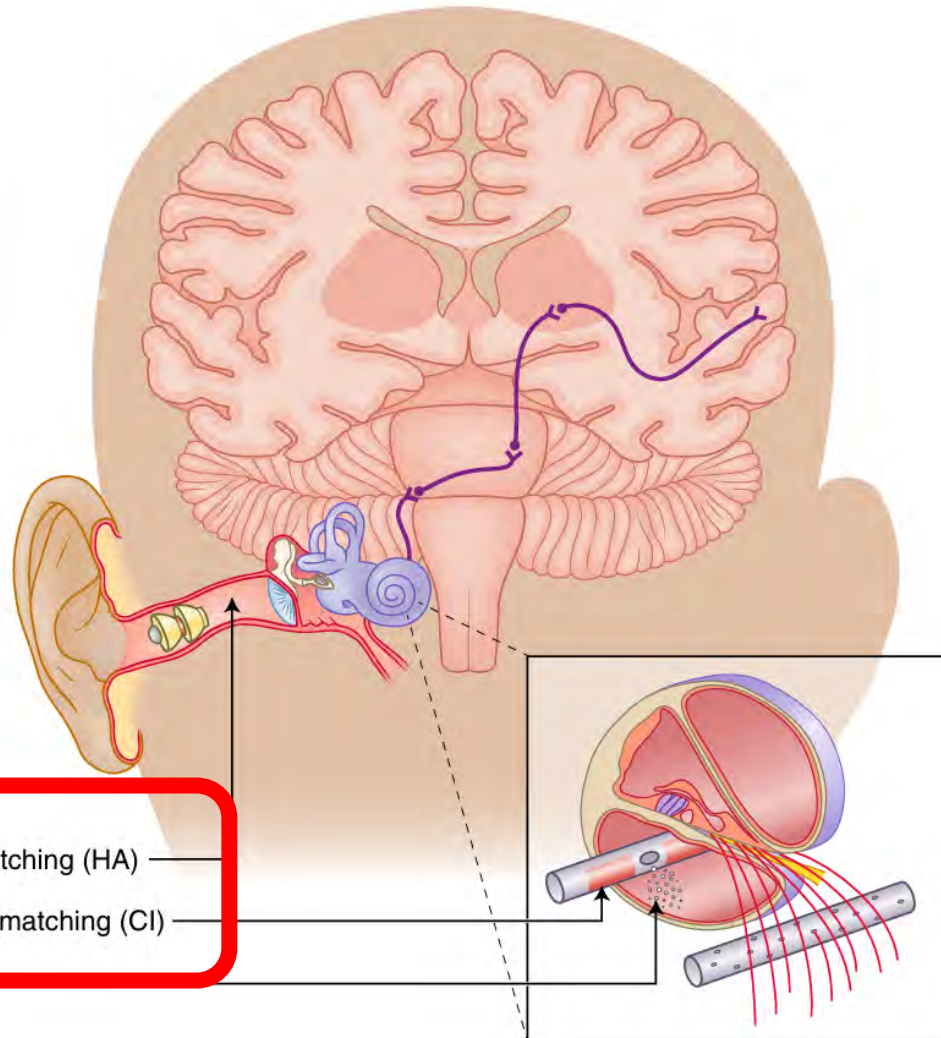
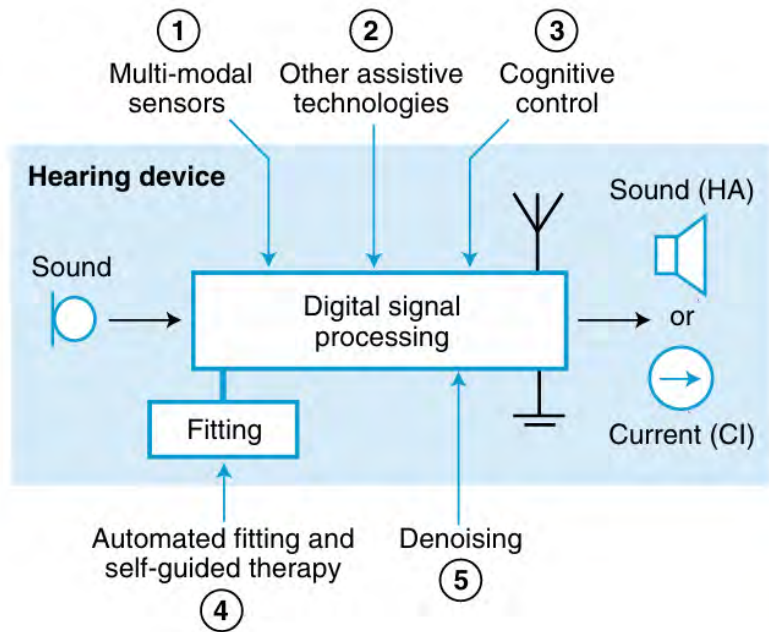
- Augmented reality display provides live captioning
- Sensors control directional microphone

AI CAN IMPROVE THE PERFORMANCE OF HEARING AIDS, COCHLEAR IMPLANTS, ETC.



**Stay tuned for
Cole's talk!**

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⑥ Sound-to-neuron matching (HA)

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AI CAN DISCOVER BETTER SOUND PROCESSING STRATEGIES FOR HEARING AIDS

Hearing loss changes how the ear talks to the brain, making it harder for the brain to understand what the ear is saying ...

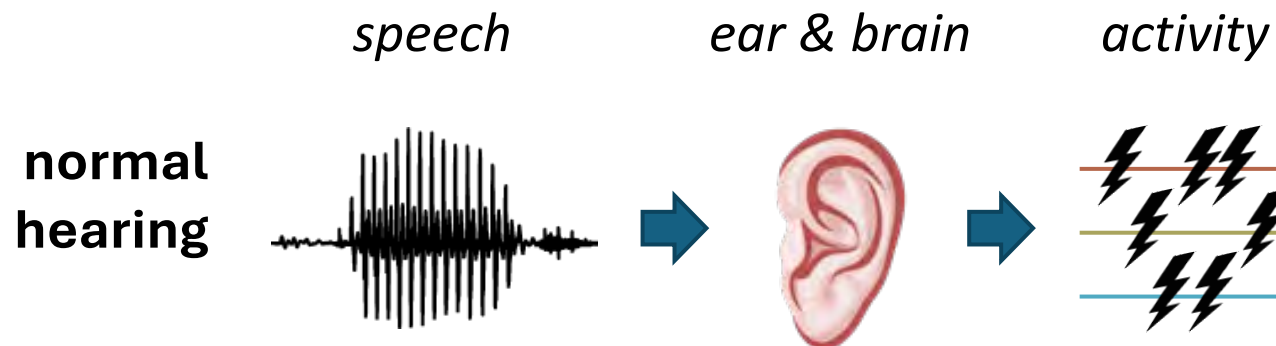
Hearing aids help the ear talk louder but that doesn't always help!

Ear

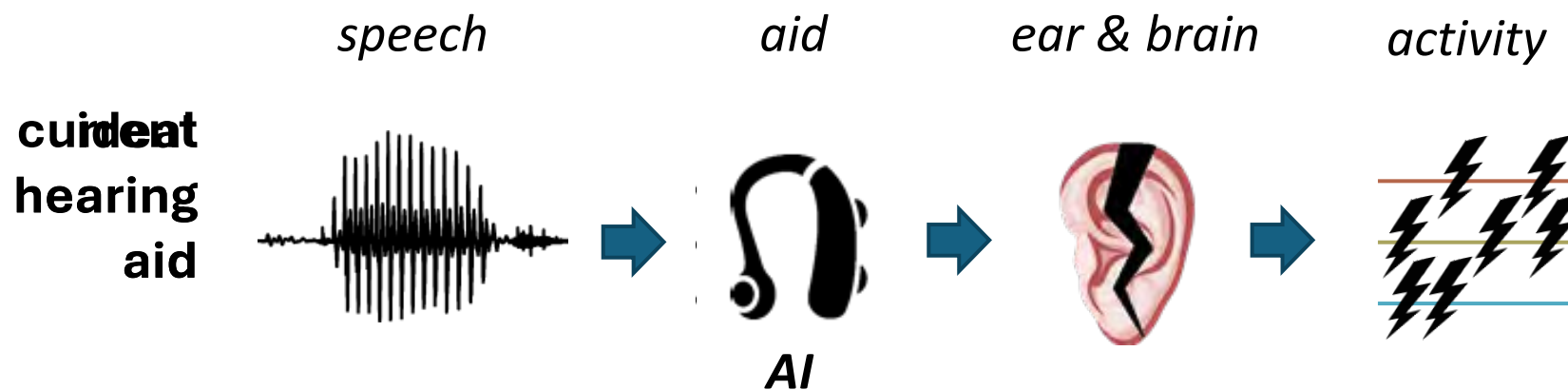
Brain



AI CAN DISCOVER BETTER SOUND PROCESSING STRATEGIES FOR HEARING AIDS



**AI can learn to restore
the brain's internal
representation of sound**



HARNESSING THE POWER OF AI TO TRANSFORM HEARING HEALTHCARE

AI can make hearing healthcare more accessible and effective

- **More accurate and available diagnostics**
- **Better performing devices**

Current stages for AI: ideas, research, prototypes, and products

What else can AI do? Therapeutics? Personalization?

How can you help?

Patients: Be vocal about what you want

Be willing to share your data

Clinicians: Take the time to engage with research