

# Cochlear Implants and Artificial Intelligence

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# Artificial Intelligence (AI)

- Enabling a computer to think or act in a more human way

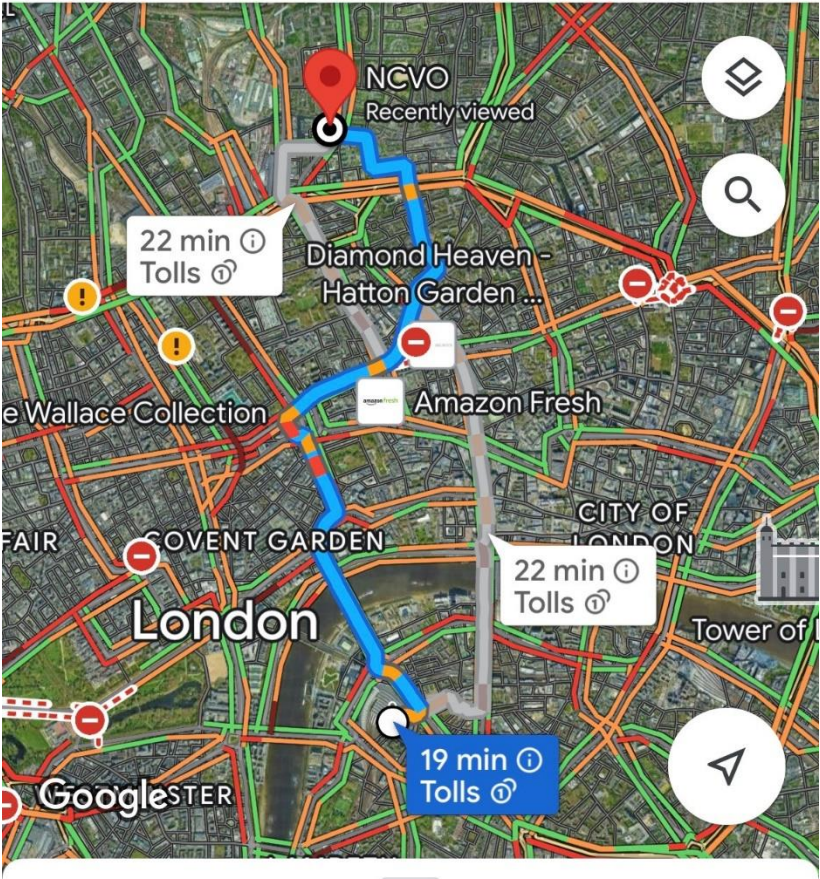
# Google maps

of npton

Waterloo Station

NCVO

19 min 28 min 57 min 19 m



22 min ⓘ Tolls ⓘ

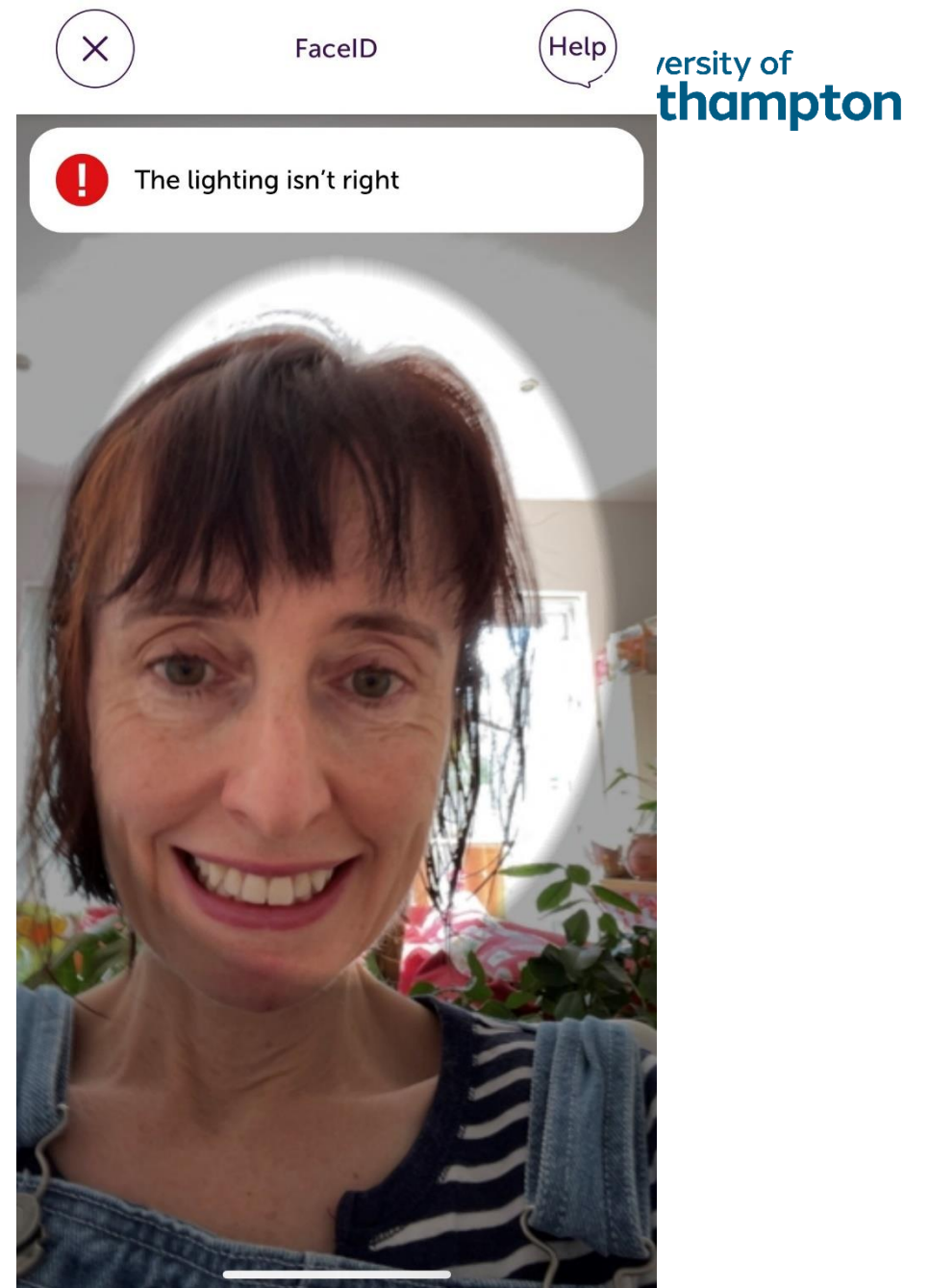
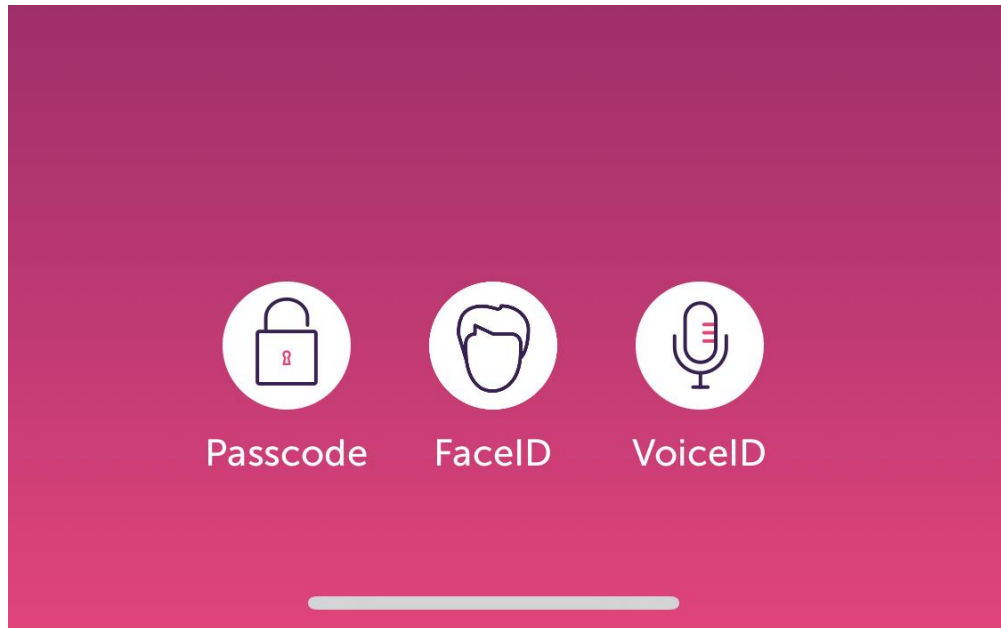
22 min ⓘ Tolls ⓘ

19 min ⓘ Tolls ⓘ

19 min (3.2 mi) ⓘ

Fastest route now due to traffic conditions

# Face and Voice ID



# Finance fraud prevention

Text Message  
Tue 12 Apr, 15:25

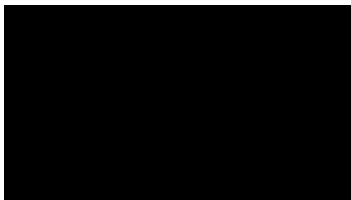
Hi HELEN. This is an important message. Did you use your Amazon Platinum credit card on: 12-04-2022 14:23:17 at HRG for GBP 65.00? Please reply 'Y' to confirm all transactions, otherwise 'N' to speak to a fraud agent.

Y

Thank you for letting us know. We apologise for any inconvenience caused. If your transaction was declined, please try again.

# Alexa, Siri

- [https://www.youtube.com/watch?v=YvT\\_gqs5ETk](https://www.youtube.com/watch?v=YvT_gqs5ETk)





# Music suggestions

## Suggested artists



Pavement



Grizzly Bear



The

## Recently played



Gorillaz



Weyes Blood



Wet Leg

# Self-driving cars





Home

**!** Are you a real person?  
I do not think you are a real person.

Information about the Sender

**You did not complete the form, or you failed the**  
Have you been given a "Request Code"?

Your name:

Your organisation:

Your email address:

confirm that you are a *real* person (and not a compu

# Other examples of AI we use now

- Social media feeds
- Targetted advertising
- Home automation
- Predictive text
- Chatbots
- Spam filters



# BBC



**AI-driven robot boat Mayflower crosses Atlantic**

2d | [Devon](#)



**Arm drones to stop shootings, says Taser-gun maker**

5d | [US & Canada](#)



**How artificial intelligence 'blew up' tennis**

31 May | [Business](#)



**AI robot paints Queen's portrait for her jubilee**

27 May | [Oxford](#)



**AI study collects thousands of heart recordings**

24 May | [Cambridgeshire](#)



**Clearview AI fined for storing UK facial images**

23 May | [Technology](#)



**Robot Dog Olympics helps develop tech solutions**

18 May | [Bristol](#)



**AI traffic lights bid to cut queues**

13 May | [Birmingham & Black Country](#)



**Should fantasy football managers use AI to win?**

8 May | [Business](#)



**Trades union chief warns on AI workplace changes**

28 Apr | [Business](#)



**The fitness mirrors that aim to get you exercising more**

25 Apr | [Business](#)

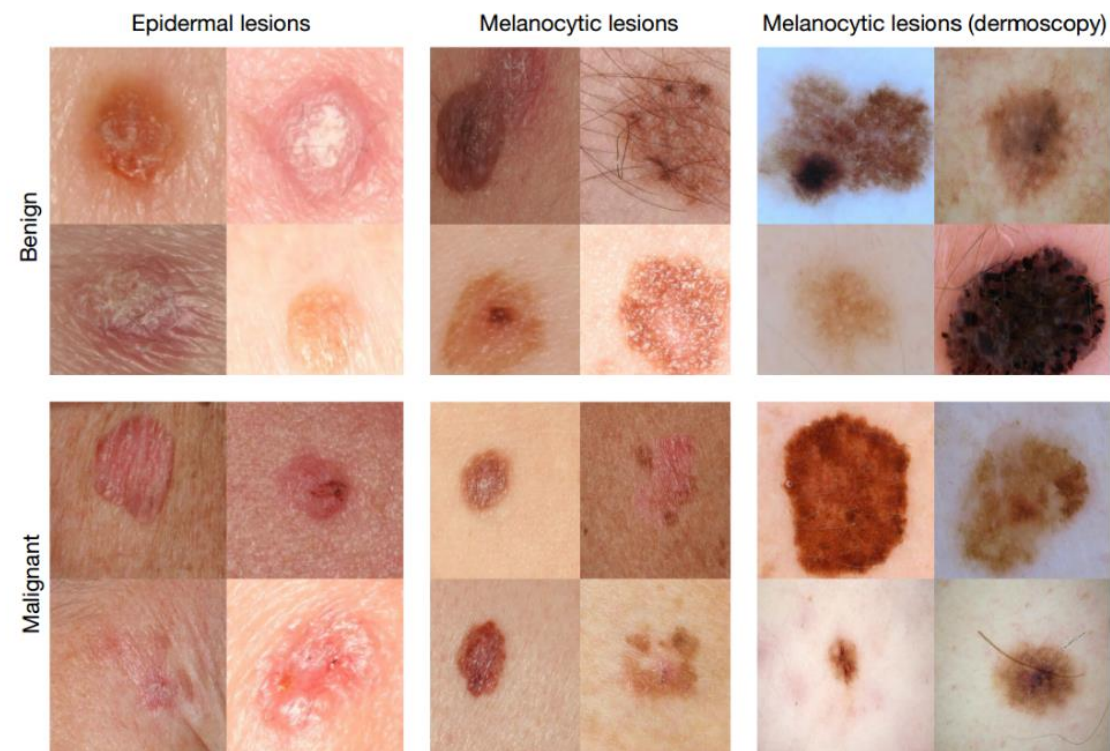


**Actors launch campaign against AI 'show stealers'**

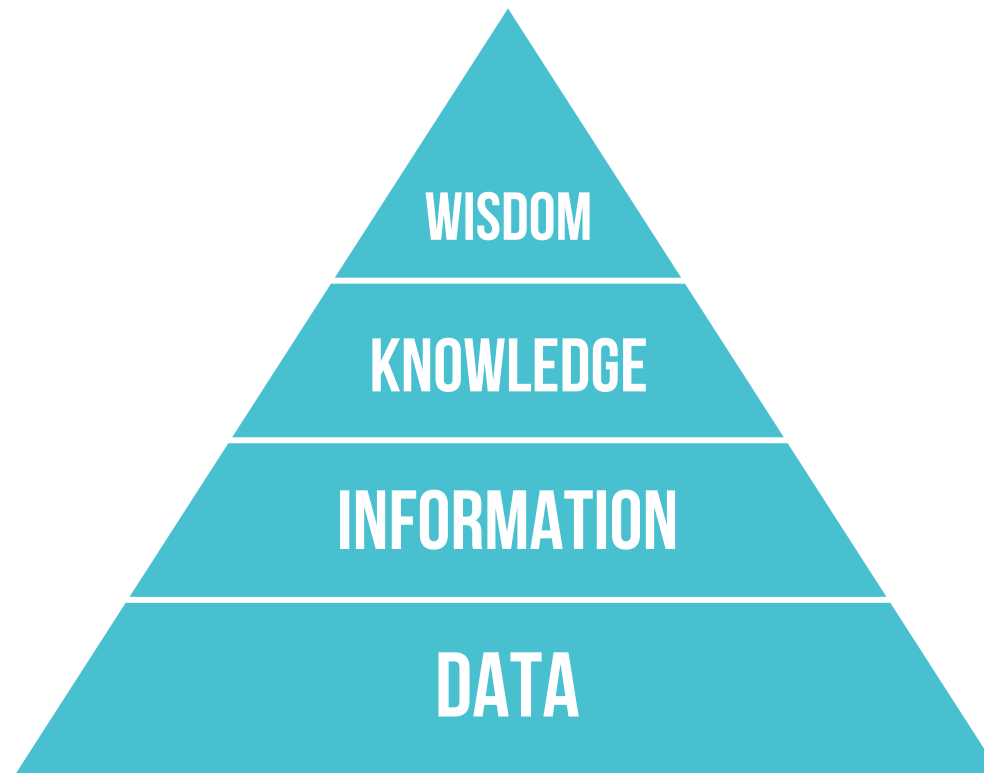
21 Apr | [Technology](#) | 95

# AI in medicine

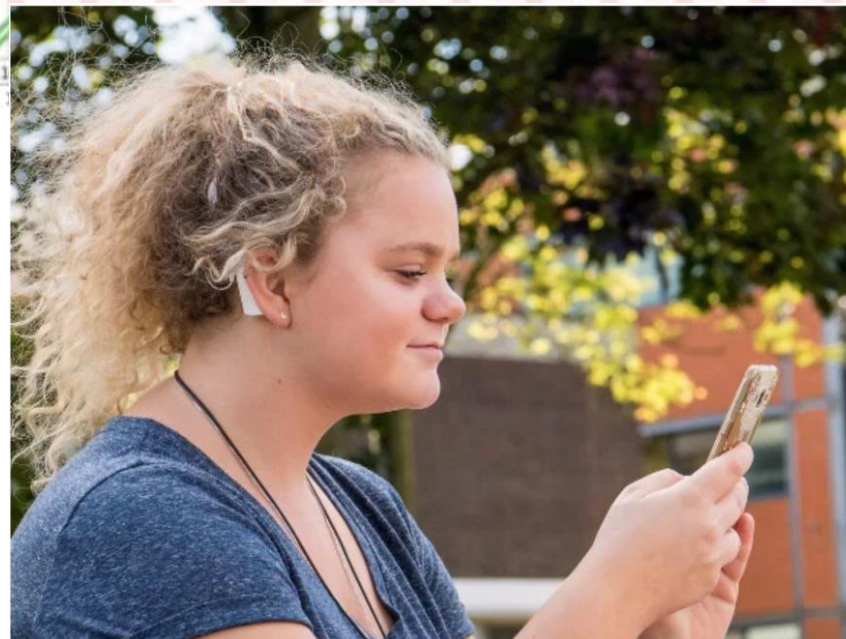
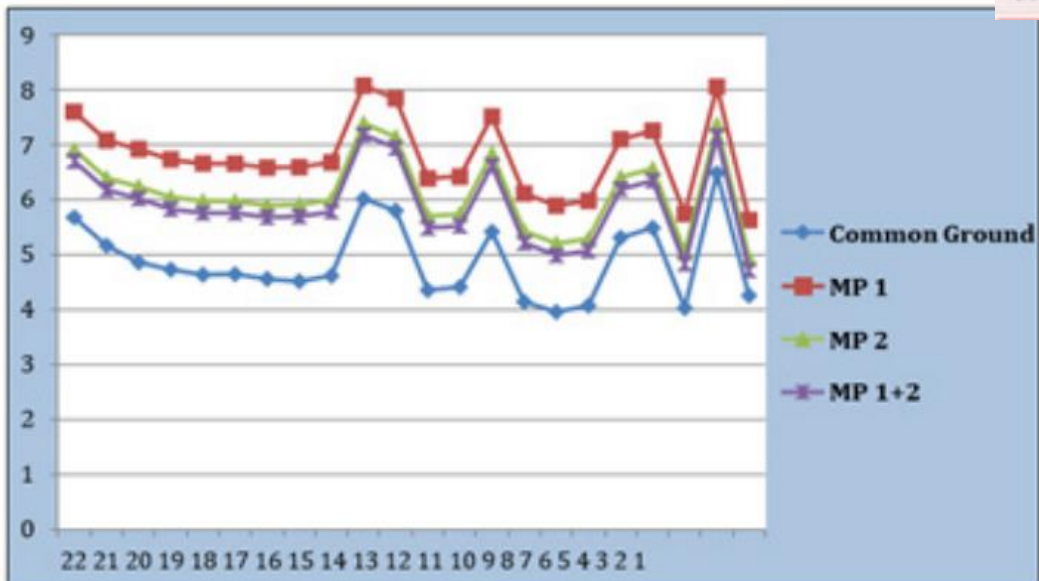
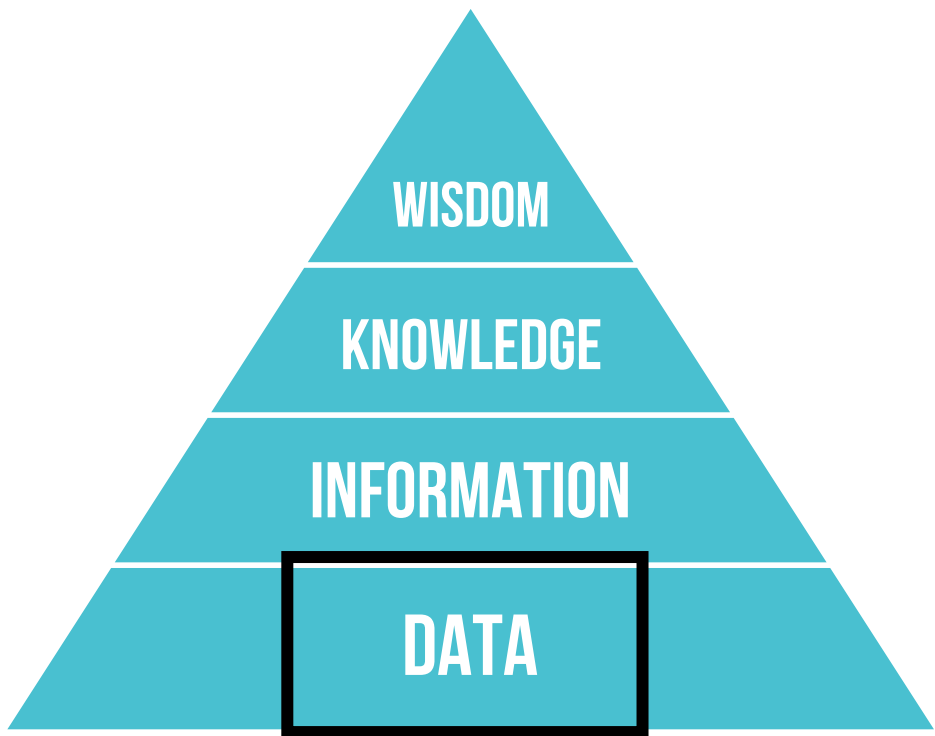
- Patient monitoring eg continuous diabetic monitoring
- Automatically screening retina images
- Distinguishing between benign and malignant skin lesions

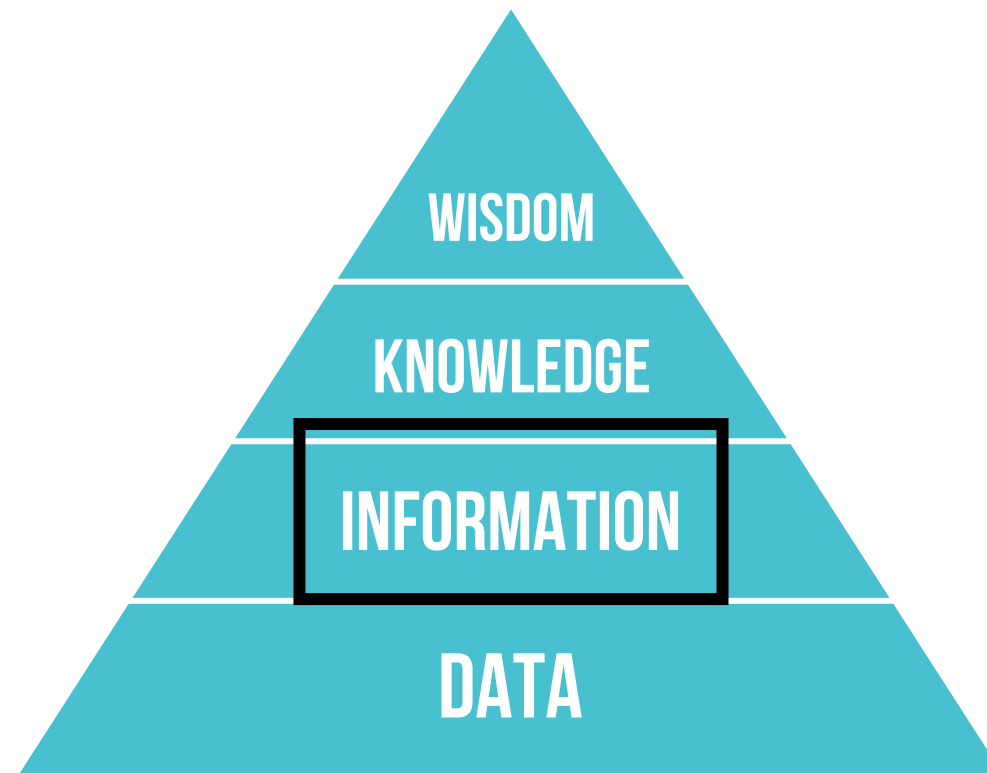


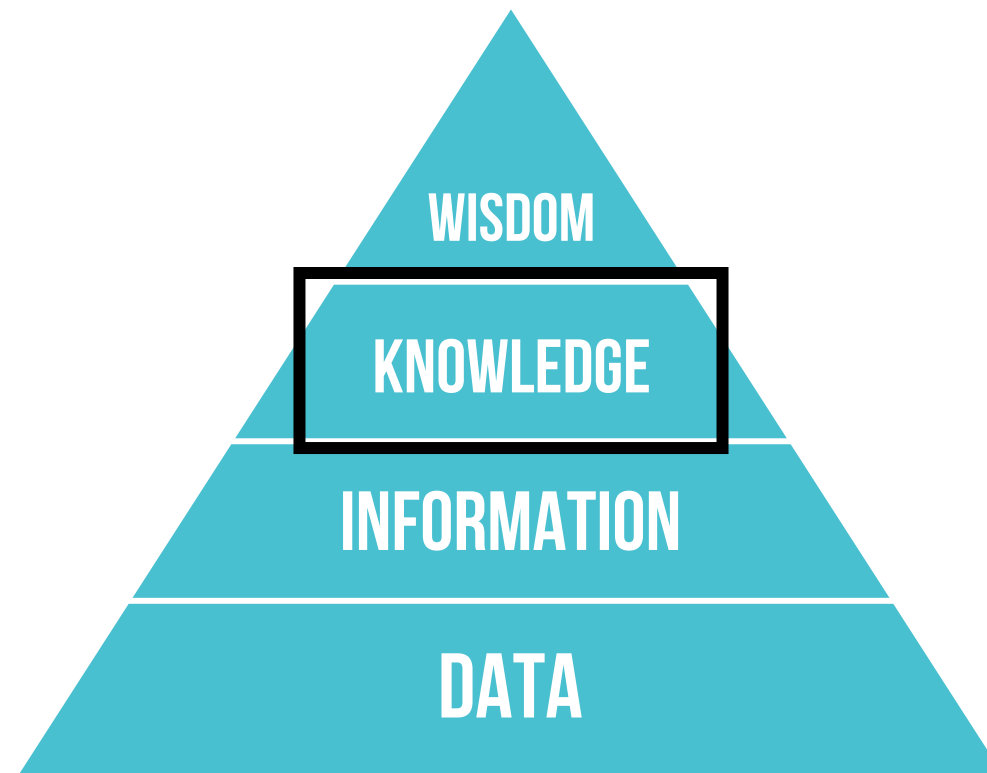
# Data-Information-Knowledge-Wisdom pyramid

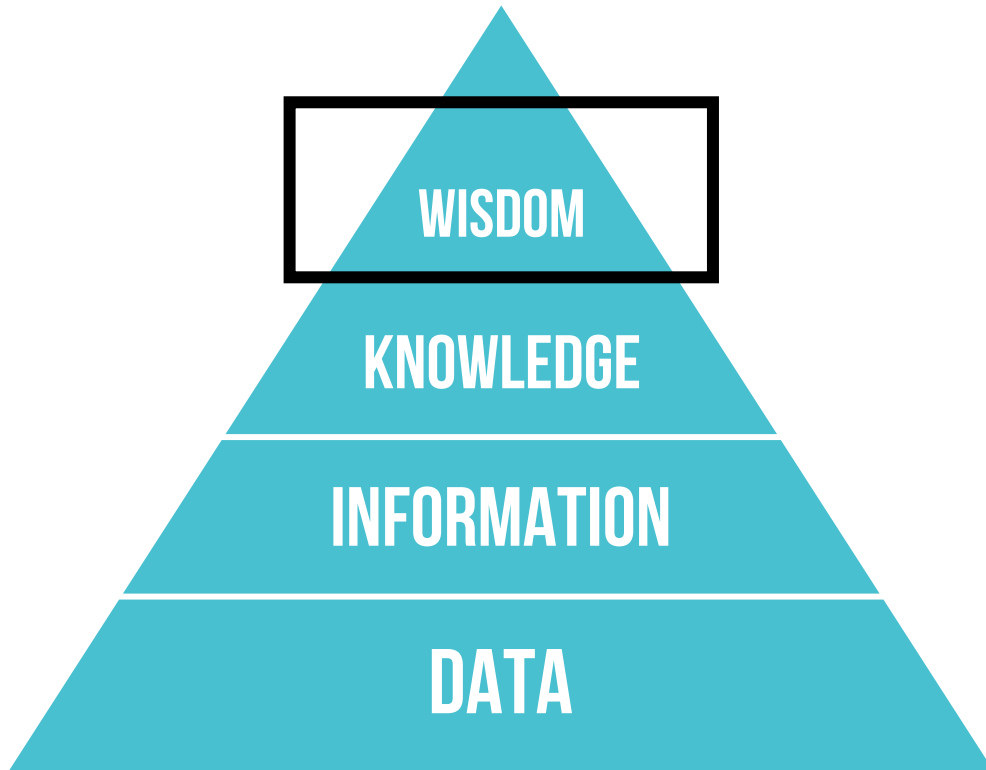












# So how does this help CI?

- Preimplant assessment
- Surgery
- Device mapping
- Rehabilitation
- Ongoing equipment maintenance



# Your CI is already using AI!

- Your processor makes decisions based on what it heard



**SmartSound® iQ**  
identifies different listening situations and  
automatically activating specific technologies.



Harnessing the Power of  
Artificial Intelligence for  
Your Listening Needs

AutoSense OS 3.0

# Hearing aid example

- Oticon More hearing aid was trained—using 12 million-plus real-life sounds—so that people wearing it can better understand speech and the sounds around them



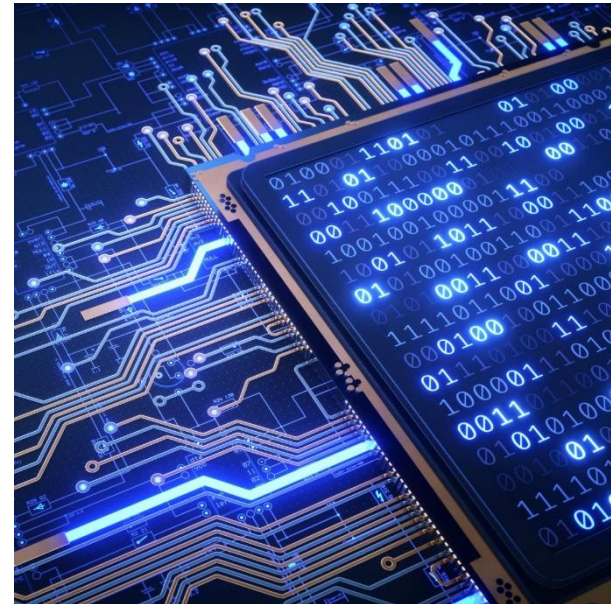
# Device mapping

- More than 6,000 CI clinicians worldwide
- Should we do mapping based on outcomes? Patient comfort?  
Average data from a million people worldwide?
- So many parameters adjustable parameters (T-level, C-level, gain, loudness growth, strategy, T-SPL, C-SPL, dynamic range, sensitivity, volume, rate, maxima, pulse width, frequency table, AGC, IDR etc)
- MILLIONS of possibilities

But ... would a computer do this better than me?

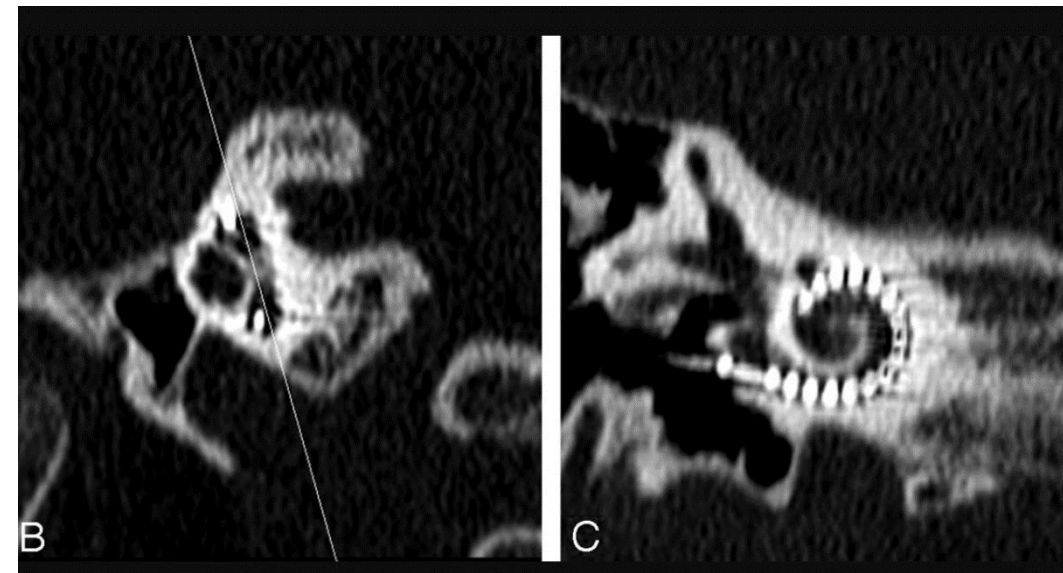


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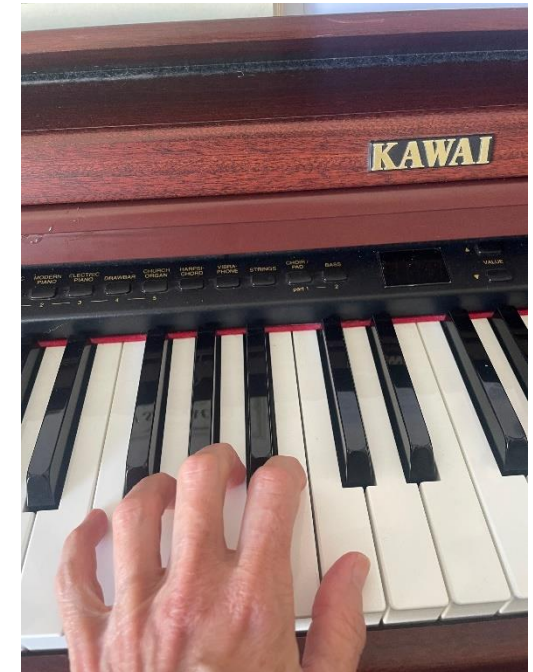
# Other ideas for AI in CI

- Predicting performance
- Surgery – using scan info to optimise electrode positioning
- Switch-on
- Predicting current spread in the cochlea
- Speech in noise recognition
- Monitoring of device
- Speech to text apps





But ... would a computer do this better than me?





# Definitions

- machine learning - machines use a set of rules to sort through giant amounts of data and make decisions or predictions
- neural networks - mimic the neural habits of the brain, aims to respond the same way your brain would, without being explicitly programmed how to react in a given situation
- data mining – analysing large databases to generate new information
- big data – large and complex data sets