When thoughts control machines

What's in store for us?

Discussion Questions

- How you like to improve your mental abilities within a few days? Would you like to do that?

- Would you like to connect to your computer with your mind? Why or why not?

- Are you willing to undergo brain surgery to become intergrated with computers?

- Do you feel technology is always used for the right reasons? Can you think of any examples where technology was not used in the way it was intended?

- Merging our minds with machines could represent the most significant upgrade to intelligence since human beings evolved. But are we ready? What problems could there be?

- Ads, cookies and pop ups are continuously being planted into our computers by numerous corporations. How can we be sure that our brain "inbox" will be completely ad free and that this data transfer includes spam and virus protection?

- Anxiety, nervousness and stress-related conditions are already a health issue nowadays. How will we cope with the astonishing amount of information without a nervous breakdown?

WHEN THOUGHTS CONTROL MACHINES 1/2

A brain-computer interface (BCI) is a direct communication link between a person's brain with an external device. The development of a BCI could be the most important technological breakthrough in decades because it would open a new field of technology while also revolutionizing how people use computers. Controlling devices using human brain waves is therefore a growing target for product development. Imagine being able to surf the internet using your thoughts, being able to write emails without typing, or even drive a car by simply thinking our actions. The applications and potential are endless. Such is the power of blended cognition; it might be able to rival that of computer-based artificial intelligence.

A BCI works because of the way human brain functions. Human brains are packed with neurons, which are individual nerve cells connected to one another by axons and dendrites. Every time we think, feel, move, or remember something, neurons are at work – sending electrical pulses up and down these pathways. These interfaces mimic these signals to where it can decode and encode information that it suitable for both the brain and computers.

WHEN THOUGHTS CONTROL MACHINES 2/2

Announced in 2013, the Brain Initiative is a number of programmes designed to bridge the gap between the human brain and the digital world. This ambitious initiative includes universities, tech companies, and neuroscientists across the United States. Its objective is to thoroughly understand the way the human brain processes information and to develop new technologies that enrich the scope of humans in both the digital and physical world.

More recently, Elon Musk, a billionaire entrepreneur, unveiled in 2020 that his company Neuralink successfully implanted a coin-sized computer chip into Gertrude – a pig. The public demonstration showed that the 1,024 implanted electrodes worked, but also sent information wirelessly to where researchers can both see and hear when Gertrude's brain sends signals to the implant.

Future goals for this project is to increase the number of electrical wires that are implanted to read more information from the brain - from thousands to billions of electrodes. Matthew MacDougall, a neurosurgeon working for Elon Musk, said that these implants may one day be able to help people who are paralysed and restore full body motion. This invention would be the first step towards transhumanism – the blending of humans with advanced technology. [END]

Reading Questions

1. What is a BCI device?

2. What are the possible applications of this device?

3. What happened in 2020?

4. What is an electrode?

5. Who is Gertrude and why are they significant?

6. What is a neuron?

7. What is
Matthew MacDougall's opinion of the technology?

Vocabulary

A. Upgrade

B. Interfaces

C. Implant

D. Devices

E. Motor cortex

F. Cursor movement

G. Prosthetic

H. Robotic

I. Limb

J. Bewilder

K. Neurons

L. Map

1. An artificial body part, such as a limb, a heart, or a breast implant.

2. Relating to machines:

3. Raise (something) to a higher standard.

4. Record in detail to act a guide for the future.

5. An arm or leg of a person or four-legged animal, or a bird's wing.

6. An object placedin something else, especially a piece of tissue, prosthetic device, or other object.

7. A specialized cell transmitting nerve impulses.

8. Verb; gerund or present participle: bewildering: cause (someone) to become perplexed and confused.

9. A device or program enabling a user to communicate with a computer: a device or program for connecting two items of hardware or software so that they can be operated jointly or communicate with each other.

10. A region of the cerebral cortex involved in the planning, control, and execution of voluntary movements.

11. Arrow keys or cursor movement keys are buttons on a computer keyboard that are either programmed or designated to move the cursor in a specified direction.

12. A thing made or adapted for a particular purpose, especially a piece of mechanical or electronic equipment.

Vocabulary ANSWERS

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1.   An artificial body part, such as a limb, a heart, or a breast implant. Prosthetic.

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9.   A device or program enabling a user to communicate with a computer: a device or program for connecting two items of hardware or software so that they can be operated jointly or communicate with each other. Interface.

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Video Task

1. What would happen if you could connect your brain to the internet?
2. What is the name of this clinical trial?
3. Where does the implant go?
4. What is this neuro technology designed for?
5. What is Brown University clinical trial about?
6. What is Braingate about?
7. What have some of the Braingate volunteers been able to do?
8. What do the sensors do?
9. How can participants control a robotic device?
10. What is the Brain Initiative about?
11. What is a hydra?
12. Who is Bryan Johnson?

Video Task - Answers

1. You would not need to type into a search engine you could just think your query and download the relevant knowledge directly into your mind.

2. It is called Braingate.

3. The implant goes directly into the motor control area of the brain.

4. It is designed to help restore replaced function or enhance independence for people who are paralysed.

5. In Braingate's pioneering clinical trial at Brown University, volunteers have been given brain implants that allow them to control devices using thought alone.

6. To date, this pilot clinical trial has enrolled participants and each of those has had the sensor placed in the motor cortex and each of them has been able to control cursor movement on the screen.

7. Some of them have been able to control a prosthetic limb or a robotic limb, moving through space to reach and grab objects.

8. The sensors, which are decoded by a computer in real time, detect the neural signals associated with the intent to move.

9. Simply by imagining intuitive movements, participants can immediately control a robotic device.

10. The Brain Initiative is a 6 billion dollar fund to find new ways to map the activity of an entire brain.

11. In 2017, Professor Yuste's team announced that they had successfully recorded the activity from every neuron of an animal, albeit a very simple one: a tiny fresh water relative of the jelly fish called a hydra.

12. Bryan Johnson is a tech entrepreneur and founder of Kernel, a neural interface start-up.

Debate - Pros and Cons

Benefits of brain-computer interface

A BCI can know what you are thinking before you do. That is, they can identify the electrical neural patterns as a thought - before the pattern has fully manifested in to a conscious feeling/command.

BCIs hold great potential for people who are paralyzed, have Parkinson's disease or otherwise are unable to use their hands.

BCI may also be able to help people that have lost their voice. There is the possibility of talking via a robotic voice or translate thought to text on a screen.

By implanting the chips inside military personnel, a country could fight wars without having to send its soldiers to the battlefield and save many lives.

Drawbacks of brain-computer interface

Research on BCI is now at a fairly basic level considering the complexity of the problem.

By the time being, BCIs are quite inaccurate and have limited ability to read and classify neural activity and brain signals.

BCIs that are placed under the skull require drastic surgeries.

Reading people's inner thoughts comes with a considerable amount of ethical issues.
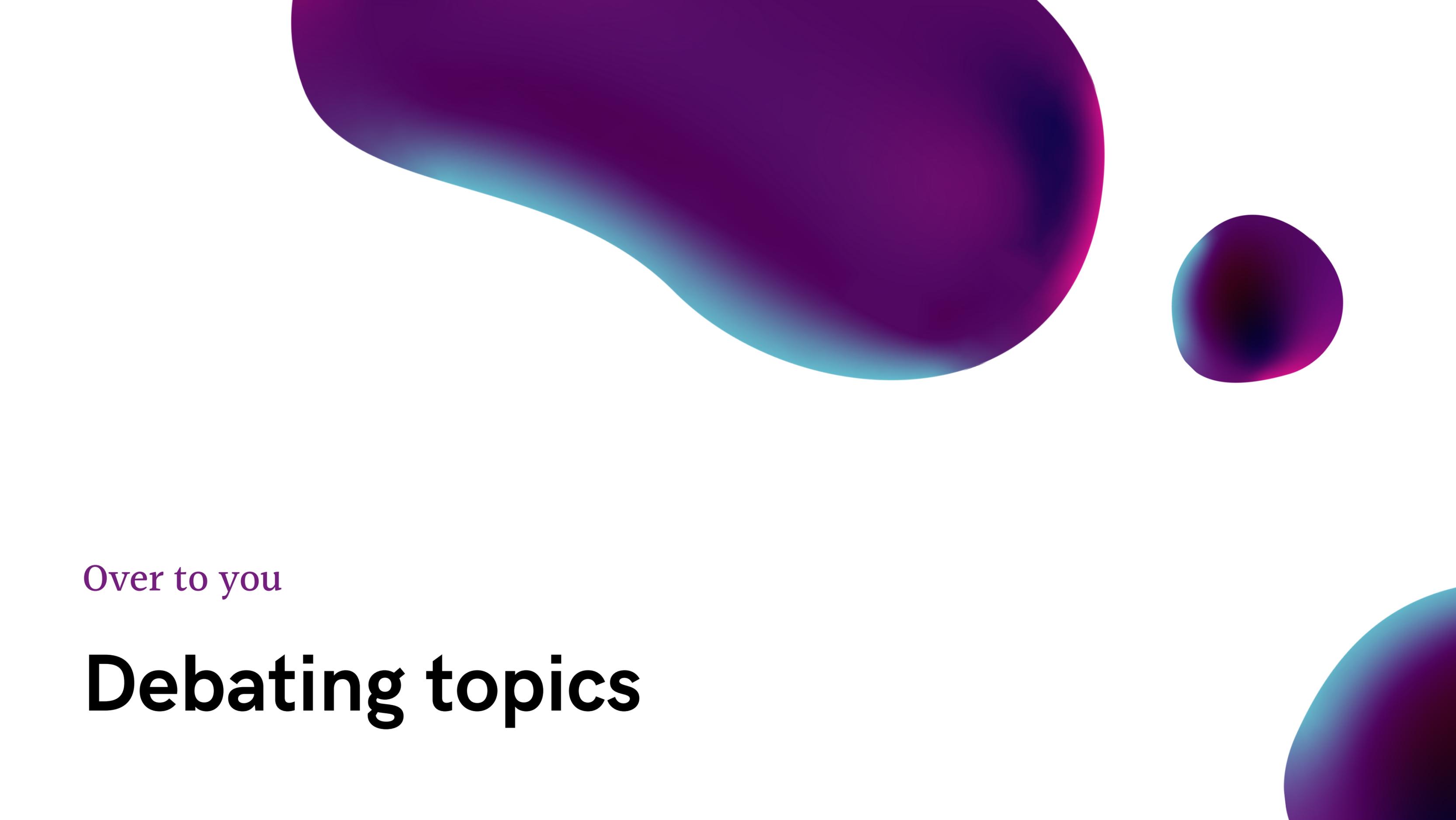
Over to you

Debating topics

Debate Topics

Humans VS Machines?

Brain-machine interface systems will ultimately rise against humans and will put an end to humankind.

Transhuman?

Machines will fully answer the commands of human brains. With BCIs, humans will be totally upgraded and enhanced.

A Big Brother future?

With BCIs, the provided information will not be secure or protected. The Big Brother is around the corner and it will be inside your head!

Are they safe?

BCIs are completely safe. Humans will be totally able to set the extent to which machines can operate.