

# Computer science

with Professor Mahadev Satyanarayanan and Professor Nigel Davies

## Talking points

### Knowledge

1. What is edge computing?
2. What is the Internet of Things (IoT)?

### Comprehension

3. Why are low latency and high bandwidth important for applications that might use edge computing?
4. What is the concept of technology-mediated serendipity?

### Application

5. What are some IoT technologies you can think of that could benefit from edge computing?
6. What questions would you ask Satya and Nigel to learn more about their careers and work in edge computing? How could you apply their career insights to your own career aspirations?

### Synthesis

7. Older people often find it more challenging to adapt to new technologies. How could this potentially be overcome when developing wearable cognitive assistance technologies?

### Evaluation

8. In the wake of the COVID-19 pandemic, the value of 'corridor encounters' for spontaneous creativity has been touted by employers as a key argument to encourage workers to return to the office, rather than working remotely. How important do you think in-person encounters are? How far do you agree with Nigel that elements of computer science could recreate these serendipitous interactions?
9. There are countless examples in the media that depict a future where technology has got out of control and is harming people's lives. To what extent do you think there are risks of such events when considering the applications of edge computing? How might these risks be mitigated?
10. "Computer programming is arguably as fundamental a skill as reading, writing and arithmetic," says Satya. In light of this, do you think that programming should be a compulsory subject in schools? Why or why not? Think about possible future trends in your answer.

## Activity

For edge computing to become a mainstream reality, there needs to be a strong business case for its rollout. Often, innovators can inspire investors and funders to contribute by vividly describing a future with the technology they imagine.

Re-read the sections in the article on 'wearable cognitive assistance' and 'technology-mediated serendipity'. For each of these sections, imagine a specific instance of how the technology described could be specialised and applied to improve people's lives.

For each of your examples, write a short creative piece about the technology in action benefitting somebody's life. While you are doing so, consider the following:

- What is the issue that this technology is solving?
- What does the technology look like?
- How does the person operate the technology?
- What other infrastructure does the technology need?
- Are there privacy and security concerns, and how might these be addressed?
- How can you make your story both realistic and inspiring?

Share one of your stories with a classmate, and listen to one of theirs. What did you like about each other's stories? Was it clear, realistic and inspiring? To what extent do you hope this technology becomes a reality in the future, and why?

## More resources

- Nigel recommends the Micro:bit Educational Foundation, a collaborative, international initiative that to date has helped 39 million children and teachers learn about coding and technology through providing pocket-sized computers and a wide range of resources, including wearable and IoT devices: [www.microbit.org](http://www.microbit.org)
- This article from Microsoft describes the concept of edge computing and why it can be so useful: [azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-edge-computing](https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-edge-computing)
- This paper from Satya, Nigel and Nina Taft investigates technology-mediated serendipity in detail, in particular focusing on interactions with privacy concerns: [dl.acm.org/doi/pdf/10.1145/3508396.3512873](https://dl.acm.org/doi/pdf/10.1145/3508396.3512873)
- Watch a video from the archives about the Andrew Project that Satya mentions: [www.youtube.com/watch?v=sT-pnQc0V2E](https://www.youtube.com/watch?v=sT-pnQc0V2E)