

## Key Stage 4 Worksheet

# Podcast: Is there a 'digital darkness' descending? Professor Matt Jones



Swansea  
University  
Prifysgol  
Abertawe



From the series: Exploring Global Problems, by Swansea University

## What is it about?

- Digital technology and global inequalities of access to things we take for granted, for example people in certain remote areas not having access to the internet.
- Divisions technology causes in society. People having different opinions on whether certain technology is good or bad.
- Conflicts between technology and human values.
- Challenges from Artificial Intelligence and big data.
- Human-centred computer science.



**Listen to the podcast:**  
[swansea.ac.uk/research/  
podcasts/matt-jones/](https://swansea.ac.uk/research/podcasts/matt-jones/)

**Open file in your web  
browser to click on the  
links.**

## Background

In this podcast, professor Matt Jones talks about:

### Human-centred technology

Human-centred technology means thinking about a user's needs and how they will use a piece of technology, then building that into the design.

### Research with voice assistants (like 'Siri' and 'Alexa')

Voice assistants are becoming a common digital tool in UK homes. One thing we can use them for is asking questions and getting an answer in response. Around the world though, people have very different home cultures. Matt and his team have been investigating how people use voice assistants in different cultures.

## Background continued...

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In Dharavi, Mumbai (in India), Matt and his team put voice assistants in the streets, rather than in people's homes, to find out how people interacted with them to help in the future design of these technologies. In their 'street Alexa' study, people could choose to ask question to a human if they were not happy with the answer given by the voice assistant. Matt and his group could then compare the quality of the answers from the machine and from humans and how satisfied people were when they interacted with a voice assistant and a human.

### 'Digital Darkness'

There have been many surveys by governments; non-governmental organisations and the media which show that people have concerns about technology-use in society. Parents and carer often worry about the **use of technology by their children**, people also often worry about how much information governments and companies are able to gather about populations **through their smartphone** etc. There have also been research projects exploring how **accurate online information** is particularly in relation to emotive topics such as climate change. Matt points out though that there have often been moral panics about many forms of 'new technology' throughout the past, including radio, films and types of pop-music.

Big technology companies like Google and Facebook use human-centred design in their products and need to consider the ethical, privacy and security concerns that come with designing new technology.

## Find out more about it

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- **Use this BBC Bitesize study guide** to learn about the ethical, legal and environmental impact of technology.
- **Read this Wired article** about why human-centred design matters.
- **Watch this TED Talk** on machine learning and how computers are learning to be creative.
- **Read more** about the Computer Science research groups at Swansea University.
- **Find out** how you can improve your digital well-being with Google.

## Questions

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**Interactive: Click on box to start typing**



1. What two types (brands) of voice assistants does Matt mention?

2a. What kind of ethical issues does Matt talk about with smart speakers? What recent concerns have people been having with companies like Facebook, Amazon and Google?

2b. Do you think this has legal issues too? Explain your answer.

3. Explain what is meant by Artificial Intelligence and big data.

# Exercise

Imagine you are designing some software for a voice assistant (like an Amazon Alexa). You want to create an algorithm which allows the voice assistant to answer a question asked by the user. If the voice assistant can't answer the question, then the user should be asked if they would like their question to be sent to a human. If the user answers 'yes', a voice recording of the question should be sent to a human so they can answer it and reply.

**Design an algorithm which will do this. You can use either:**



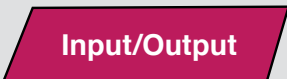


## 1. Pseudo-code

Rules and helpful hints:

- Your algorithm should have inputs and outputs. What will they be?
- Use right-arrows to assign values, e.g. the pseudo-code for 'the user asks a question, which is then used as the input value' could be written as  
question ← USERINPUT
- What processes do you need in your algorithm?
- Try breaking down the problem into smaller and smaller chunks, until each chunk can be described by a simple process. This is called decomposition and is an important step in algorithm design.

## 2. A flowchart

A flowchart can give a visual representation of an algorithm. Flowcharts use different symbols to represent different elements of an algorithm. The common standard symbols used in a flowchart are:

| Symbol  | Name         | Use  |
|---|--------------|--|
|  | Line         | Shows the flow from one part of the algorithm to the next. |
|  | Process      | An action.   |
|  | Input/Output | An input or an output.                                     |
|  | Decision     | A yes/no/true/false decision.                              |
|  | Terminator   | The start or end of the process.                           |

# For teachers and home schoolers

Links to Science in the National curriculum for Wales (KS4)

## GCSE Computer Science

*Understanding computer science: Security and data management: Data security:* Describe the dangers that can arise from the use of computers to store personal data.

*Understanding computer science: Ethical, legal and environmental impacts of digital technology on wider society: Ethical:* Describe the ethical impacts of digital technology, including issues of privacy and cybersecurity.

*Understanding computer science: Ethical, legal and environmental impacts of digital technology on wider society: Environmental issues:* Describe the environmental impacts of digital technology on wider society.

*Computational Thinking and Programming: Problem solving: Problem solving:* Use a systematic approach to problem solving including the use of decomposition and abstraction.

*Computational Thinking and Programming: Algorithms and programming constructs: Algorithms:* Use common methods of defining algorithms, including pseudo-code and flowcharts.

*Computational Thinking and Programming: Algorithms and programming constructs: Programming constructs:* Write algorithms and programs that solve problems using input, processing and output.

*Software Development: Software development: Scope of the problem:* Analyse the given scenario in terms of input, processing and output.

*Software Development: Software development: Effectiveness of solution:* Create a solution that fulfils the requirements of the given scenario.



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