Starting up

- What areas of human decision making have been taken over by computers?
- Give examples, perhaps ones in your job, or one you would like to work in.

- Read through the whole article. Then do the exercise below.

Reading 1

Read the article again to find:

a) two academics
b) their specialities
c) the institutions that they work at
d) an article written by one of them
e) the name of someone who analyses numerical information
f) the name of their profession
g) three government agencies in the US
h) two of these agencies that are regulators – Guess what the initials of the second agency stand for.

Trusting AI too much can turn out to be fatal

It is a truism of our age that we suffer from a deficit of trust. But in some areas of technology, the opposite is true: there is an alarming surfeit of trust. The tendency for humans to overtrust automated decision-making systems has a long and tragic history. Software bugs have caused all manner of societal malfunctions. Millions of people have lost money on investments, received incorrect medical diagnoses, been falsely arrested, given excessive prison sentences and died in aeroplane crashes because of software failures. Yet all too often we follow faulty automated instructions because "the computer can't be wrong".

The problem is growing more acute as we entrust ever more decisions to ever more complex computers. Some computer scientists warn we risk relying on artificial intelligence systems for consistency and explainability rather than acknowledging uncertainty and accepting variance of outcomes. Neil Lawrence, professor of machine learning at Cambridge university, says he is increasingly nervous about the unrealistic promises made by some in the AI industry that they can inject common sense into computer systems and infer intent. "Up until now, every technology has been adapted to our needs. But we say we are now building the first systems that are responsive and adaptive to our needs," he says.

The trouble is that human preferences are often incoherent, incomplete, inconsistent or mistaken. Uncertainty is endemic and circumstances change. "The physical world is constantly kicking you. The real world does strange things," says Prof Lawrence. That is not to deny that computer models can be incredibly useful, even under uncertain conditions. But their limitations must be constantly kept in mind. In a paper, Decision Making and Diversity, Prof Lawrence quotes the statistician George Box: "Since all models are wrong the scientist must be alert to what is importantly wrong. It is inappropriate to be concerned about mice when there are tigers abroad."

How we collectively learn from the flaws of machines may be just as important as understanding the failings of humans. Jack Stilgoe, a social science lecturer at University College, London argues that we will benefit from advances in machine learning provided that they are accompanied by social learning. Two general regulatory models exist, but perhaps more need to be invented. The first is "anticipatory governance", as practised by the US Food and Drug Administration, which regulates the pharmaceutical industry. Drugs are subject to extensive clinical trials and regulatory review before they are released to the public. The second is "governance by accident", as followed by the NTSB, which sounds alarming but has proved astonishingly effective in improving airline safety. "Either you 'protect and provide' or 'wait and see'," says Mr Stilgoe. But what is essential, he suggests, is to create a collective societal capacity to understand emerging technologies and decide on the appropriate regulatory framework. We cannot leave all this to powerful private corporations.

Companies certainly have a duty to refrain from launching inadequately tested products on to the market. But every user has a responsibility to exercise due caution, too. The US National Park Service urges all visitors to Death Valley to carry up-to-date maps in case of accident or breakdown and exercise common sense because of unreliable connectivity in the area. "Do not depend only on your vehicle GPS navigation system," it warns. That is a general warning we should all observe.

Vocabulary 1 – synonyms

Look at the first three paragraphs. Replace the words and expressions with the correct alternative that has the closest meaning. (The item must also fit grammatically into the surrounding context, which does not change.)

1 in some areas of technology, the opposite is true: there is an alarming *surfeit* of trust.
a) surplus b) excess c) overestimate

2 The tendency for humans to overtrust automated decision-making systems has a long and *tragic* history.
a) very sad b) very positive c) very dramatic

3 Software bugs have caused all *manner* of societal malfunctions.
a) sort b) type c) kinds

4 Millions of people have lost money on investments, received incorrect medical diagnoses, been *falsely* arrested, given excessive prison sentences and died in aeroplane crashes because of software failures.
a) badly b) negatively c) wrongly

5 The problem is growing *more acute* as we entrust ever more decisions to ever more complex computers.
a) more serious b) better known c) more soluble

6 Some computer scientists warn we risk relying on artificial intelligence systems for consistency and explainability rather than *acknowledging* uncertainty and accepting variance of outcomes.
a) realising b) admitting c) informing

7 Neil Lawrence … says he is increasingly nervous about the unrealistic promises made by some in the AI industry that they can inject common sense into computer systems *and infer intent*.
a) so that they understand human intentions
b) so that they copy human intentions
c) so that they receive human intentions

8 The trouble is that human preferences are often *incoherent*, incomplete, inconsistent or mistaken.
a) incomprehensible b) insane c) illogical

9 Uncertainty is *endemic* and circumstances change.
a) everywhere b) in a few places c) in some places

10 “It is inappropriate to be concerned about mice when there are tigers *abroad*.”
a) over the border b) around c) on board

Vocabulary 2 – related forms

Complete the table with correct forms of words from paragraphs 4 and 5 of the article, and related forms.

verb	noun
advance	
regulate	
	governance
	trial
	review
release	
	protection
provide	
launch	
	exercise

Vocabulary 3 – meanings

Match the nouns in the table in Vocabulary 2 above, as used in the article with a) - i) below.

a) making a product available for the first time (2 nouns)
b) a formal word for the use of something in particular, for example being careful
c) progress
d) test
e) defence
f) supply
g) rule
h) management at the highest level
i) looking at something again

Grammar – *if* and alternatives

Rewrite the sentences, using the words in brackets.

1 Computer models can be incredibly useful, even under uncertain conditions. (even if)
Computer models can be incredibly useful, even if conditions are uncertain.

2 Stilgoe argues that we will benefit from advances in machine learning provided that they are accompanied by social learning. (only if)

3 If you understand their limitations, using automated decision-making systems is fine. (provided that)

4 New pharmaceuticals can be launched if they have been extensively trialled first. (providing that)

5 It's ok to drive in the desert if you have paper maps as well as satnav. (as long as)

6 All air accidents are investigated, even if there is no loss of life. (whether or not)

7 If you are involved in a collision, exchange details with the other driver. (in case of)

8 Wear a mask, as the air may be contaminated by fumes. (in case of)

9 After a fire alert, do not re-enter the building if the fire brigade chief has not said it is safe to do so. (unless)

10 A: Is it ok to use the new machine? B: Only if you have received relevant training. (not unless)

Reading 2

Which two of these are correct 'takeaways' from the article?

Specialists in artificial intelligence…

a) are beginning to build computers that are genuinely responsive to human needs.
b) should be more open about uncertainty in decision-making.
c) can learn from its limitations.
d) should abandon attempts to replace human decision making completely.

Further discussion / Group work

1 Make predictions about how computer decision-making will change these jobs in the next 30 years. Give your reasoning.

airline pilot	accountant	taxi driver	surgeon
cook	lawyer	nurse	gardener

2 'All too often we follow faulty automated instructions because “the computer can’t be wrong”.' Why is this? Give examples.

ANSWER KEY

Reading 1

a) Neil Lawrence, Jack Stilgoe
b) machine learning, social science
c) Cambridge university, University College London
d) 'Decision Making and Diversity'
e) George Box
f) statistician
g) US Food and Drug Administration, NTSB, US National Park Service
h) US Food and Drug Administration, NTSB - National Transportation Safety Board

Vocabulary 1

1b 2a 3c 4c 5a 6b 7a 8c 9a 10b

Vocabulary 2 and 3

verb	noun
advance	advance - c)
regulate	regulation - g)
govern	governance - h)
trial	trial - d)
review	review - i)
release	release - a)
protect	protection - e)
provide	provision - f)
launch	launch - a)
exercise	exercise - b)

Grammar

2 Stilgoe argues that we will benefit from advances in machine learning only if they are accompanied by social learning.
3 Provided that you understand their limitations, using automated decision-making systems is fine.
4 New pharmaceuticals can be launched providing that they have been extensively trialled first.
5 It's ok to drive in the desert as long as you have paper maps as well as satnav.
6 All air accidents are investigated, whether or not there is loss of life.
7 In case of being involved in a collision, exchange details with the other driver.
8 Wear a mask, in case of contamination of the air by fumes.
9 After a fire alert, do not re-enter the building unless the fire brigade chief has said it is safe to do so.
10 A: Is it ok to use the new machine? B: Not unless you have received relevant training.

Reading 2

b), c)