"HUMANITY SHOULD FEAR ADVANCES IN ARTIFICIAL INTELLIGENCE"

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INTRODUCTION

The increasing ability of machines in recent years to replicate or even supersede human abilities in complex tasks has been impressive. Already, artificial intelligence (AI) techniques have been used to allow machines to beat the best players in the world at both chess [Ref: **Time**] and the Chinese board game Go [Ref: **Guardian**]. IBM's Watson system has beaten the best human players on the long-running US quiz show, *Jeopardy!* [Ref: **Techrepublic**]. While such demonstrations of the potential for AI are intriguing, there are now more and more real-world applications for AI systems. For example, voice-recognition systems like Amazon's Alexa and Apple's Siri use AI techniques to learn what the most suitable answer to our questions might be. Driverless cars cannot be pre-programmed for every eventuality, but need to 'learn' through experience using AI. Combined with huge datasets, AI-enabled machines could learn to interpret x-rays and other scans, making diagnosis quicker and more accurate [Ref: **Technology Review**].

But the implications for society are only just becoming apparent. In 2015, the Bank of England's chief economist, Andrew Haldane, suggested that as many as one third of jobs in the UK – 15 million –

could be lost to automation [Ref: **Guardian**⧉]. Examples could include drivers replaced by autonomous vehicles and administrative staff replaced by intelligent assistants like Alexa. Moreover, it's not just low-skill jobs that are now under threat. In the future, smarter machines and artificial intelligence could affect a much broader range of jobs, including many high-paid, high-skilled positions. Facial recognition systems, combined with ubiquitous CCTV, could call into question our privacy. The world-famous physicist, Stephen Hawking, has even claimed that 'AI may replace humans altogether' as a 'new form of life' that can rapidly learn and improve, making people obsolete [Ref: **Independent**⧉]. So should we welcome AI's potential or are the perceived threats too great?

For further reading use the menu bar on the right hand side.

DEBATE IN CONTEXT

This section provides a summary of the key issues in the debate, set in the context of recent discussions and the competing positions that have been adopted.

What is AI?

The term 'artificial intelligence' was coined in 1956, but "AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage" [Ref: **SAS**⧉]. In essence, AI is "a collection of technologies that can be used to imitate or even to outperform tasks performed by humans using machines" [Ref: **The Conversation**⧉]. AI is being used in a wide range of applications, from search engines on the internet to self-teaching programs which have the ability to learn from experience, such as Google's Deepmind technology [Ref: **Financial Times**⧉]. Now, it seems, "Machines are rapidly taking on ever more challenging cognitive tasks, encroaching on the fundamental ability that sets humans apart as a species: to make complex decisions, to solve problems – and, most importantly, to learn" [Ref: **Financial Times**⧉].

The ethics of AI

AI poses some fundamental ethical questions for society. For example, how should we view the potential for AI to be used in the military arena? Although there is currently a consensus that, "giving robots the agency to kill humans would trample over a red line that should never be crossed" [Ref: **Financial Times**⧉], it should be noted that robots are already present in bomb disposal, mine clearance and anti-missile systems. Some, such as software engineer Ronald Arkin, think that developing 'ethical robots' which are programmed to strict ethical codes could be beneficial in the military, if they are programmed never to break rules of combat that humans might flout [Ref: **Nature**⧉]. Similarly, the potential for the increased autonomy and decision making that AI embodies opens up a moral vacuum that some suggest needs to be addressed by society, governments and legislators [Ref: **The Times**⧉], while others argue that a code of ethics for robotics is urgently needed [Ref: **The Times**⧉]. After all, who would be responsible for a decision badly made by a machine? The programmer, the engineer, the owner or the robot itself? Furthermore, critics say that driverless cars may be involved in situations where there is a split-second decision either to swerve, possibly killing the passengers, or not to swerve, possibly killing another road user. How should a machine decide? To what extent should we even allow machines to decide? [Ref: **Aeon**⧉] Others argue that technology is fundamentally 'morally neutral', as: "The same technology that launched deadly missiles in WWII brought Neil Armstrong and Buzz Aldrin to the surface of the moon. The harnessing of nuclear power laid waste to Hiroshima and Nagasaki but it also provides power to billions without burning fossil fuels". In this sense: "AI is another tool and we can use it to make the world a better place, if we wish." [Ref: **Gadgette**⧉]

A threat to humanity?

For some critics, advances in AI pose very real existential problems for humanity in the future. Oxford professor Nick Bostrom, for instance, has voiced concerns about what might happen if the ability for machines to learn for themselves accelerates very rapidly - what he calls an 'intelligence explosion'. Bostrom believes "at some point we will create machines that are superintelligent, and that the first machine to attain superintelligence may become extremely powerful to the point of being able to shape the future according to its preferences" [Ref: **Vox**]. Technology entrepreneurs Bill Gates and Elon Musk have also publicly stated fears about the dangers of artificial intelligence, and caution that there are very real risks associated with the march of the technology if left unchecked [Ref: **Guardian**], although Gates has sounded a more optimistic note recently [Ref: **CNBC**]. Autonomy is a key issue that some critics are especially concerned about, with technologist Tom Ditterich warning that despite proposals to have driverless cars, autonomous weapons and automated surgical assistants, AI systems should never be fully autonomous, because: "By definition a fully autonomous system is one that we have no control over, and I don't think we ever want to be in that situation." [Ref: **Business Insider**] Additionally, there are also practical issues critics are keen to explore, such as the future of work, with many suggesting that advances in automation will result in certain jobs becoming obsolete. Commentator Claire Foges reflects on these developments, and draws parallels with the Luddites 200 years ago, who attempted to resist the increasing automation of their jobs during the onset of the industrial revolution [Ref: **History.com**]. She notes that amid recent forecasts that up to five million people could lose their jobs because of automation [Ref: **The Times**]: "Two hundred years on, a braver newer world is arriving at astonishing speed, and threatens to make luddites out of us all. The robots are coming, they are here; creeping stealthily into factory, office and shop." [Ref: **The Times**]

A brave new world?

For advocates, the advance of AI has the potential to change the world in unimaginable ways, and they largely dismiss warnings about the dangers that it may pose. As Adam Jezard observes: "Such concerns are not new…From the weaving machines of the industrial revolution to the bicycle, mechanisation has prompted concerns that technology will make people redundant or alter society in unsettling ways." [Ref: **Financial Times**] Moreover, supporters ask us to consider the benefits that AI has already brought to us, such as speedier fraud detection [Ref: **The Banker**], which will continue to develop and revolutionise the way we live our lives. In the field of medicine, one commentator posits the increasingly plausible idea of having a program which may in future be able to recognise the difference between cancer tumours and healthy tissue infinitely better than humans, which would revolutionise healthcare [Ref: **The Times**]. Others also criticise arguments that advances in AI signal the end of humanity, and point to the fact that: "After so much talking about the risks of super intelligent machines, it's time to turn on the light, stop worrying about sci-fi scenarios, and start focusing on AI's actual challenges." [Ref: **Aeon**] Perhaps more profoundly, others question why we are so quick to underestimate our abilities as humans, and fear AI. Author Nicholas Carr observes that although: "Every day we are reminded of the superiority of computers…What we forget is that our machines are built by our own hands", and in actual fact: "If computers had the ability to be amazed, they'd be amazed by us." [Ref: **New York Times**] In addition, fundamental to the pro-AI argument is the idea of technological progress being a good thing in and of itself. Futurist Dominic Basulto summarises this point when he speaks of 'existential reward', arguing that, "humanity has an imperative to consider dystopian predictions of the future. But it also has an imperative to push on, to reach its full potential." [Ref: **Washington Post**] From the industrial revolution onwards we have gradually made our everyday lives easier and safer through innovation, automation and technology. For instance, the onset of driverless vehicles is predicted to reduce drastically the number of road traffic incidents in the future, and: "Machines known as automobiles long ago made horses redundant in the developed world – except riding for a pure leisure pursuit or in sport" [Ref: **The Times**]. So

with all of the arguments in mind, are critics right to be wary of the proliferation of AI in our lives, and the ethical and practical problems that it may present humanity in the future? Or should we embrace the technological progress that AI represents, and all of the potential that it has to change our lives for the better?

ESSENTIAL READING

It is crucial for debaters to have read the articles in this section, which provide essential information and arguments for and against the debate motion. Students will be expected to have additional evidence and examples derived from independent research, but they can expect to be criticised if they lack a basic familiarity with the issues raised in the essential reading.

FOR

Are robots going to steal your job? Probably [↗]
Moshe Y Vardi **Guardian** 7 April 2016

It's time to put these robots in their place [↗]
Ben McIntyre **The Times** 11 March 2016

'This Oxford professor thinks artificial intelligence will destroy us all' [↗]
Dylan Matthews **Vox** 19 August 2014

Automated Ethics [↗]
Tom Chatfield **Aeon** 31 March 2014

AGAINST

I for one welcome the rise of the robots. They can do the work while I play [↗]
Dominic Lawson **The Times** 20 March 2016

Will artificial intelligence destroy humanity? Here are five reasons not to worry [↗]
Timothy B. Lee **Vox** 29 July 2015

Why robots will always need us [↗]
Nicholas Carr **New York Times** 20 May 2015

Why the world's most intelligent people shouldn't be so afraid of AI [↗]
Dominic Basulto **Washington Post** 20 January 2015

IN DEPTH

Artificial intelligence and ethics: 10 areas of interest [↗]
Brian Patrick Green **Markkula Center for Applied Ethics** 21 November 2017

Top nine ethical issues in artificial intelligence [↗]
Julia Bossman **World Economic Forum** 21 October 2016

The doomsday invention [↗]
Raffi Khatchadourian **New Yorker** 25 November 2015

'Omens' [↗]
Ross Anderson **Aeon** 25 February 2013

KEY TERMS

Definitions of key concepts that are crucial for understanding the topic. Students should be familiar with these terms and the different ways in which they are used and interpreted and should be prepared to explain their significance.

BACKGROUNDERS

Useful websites and materials that provide a good starting point for research.

Don't fear the robots: why the rise of the machines is nothing to be scared of [↗]

Kevin McCullagh *Icon* 26 January 2018

The 10 most important breakthroughs in artificial intelligence ⧉

James O'Malley *TechRadar* 10 January 2018

The real danger of artificial intelligence it's not what you think ⧉

João Duarte *Hackernoon* 13 November 2017

How AI can free up professionals to add more value ⧉

Christopher Fitzgerald and Fernando Florez **ACCA** 1 May 2017

Our fear of artificial intelligence ⧉

Paul Ford *MIT Technology Review* 11 February 2015

ORGANISATIONS

Links to organisations, campaign groups and official bodies who are referenced within the Topic Guide or which will be of use in providing additional research information.

Campaign to Stop Killer Robots ⧉

IN THE NEWS

Relevant recent news stories from a variety of sources, which ensure students have an up to date awareness of the state of the debate.

How AI is taking the scut work out of health care ⧉

Jonathan Bush *Harvard Business Review* 5 March 2018

AI breakthrough: Otter.ai app can transcribe your meetings in real time, for free ⧉

Jason Hiner **ZDnet** 2 March 2018

Using AI to help stroke victims when 'time is brain' ⧉

Tom Simonite *Wired* 28 February 2018

AI experts list the real dangers of artificial intelligence ⧉

Dave Gershgorn *Quartz* 22 February 2018

Four things everyone should fear about artificial intelligence and the future ⧉

Jonathan Vanian *Fortune* 21 February 2018

Benefits of AI on employment outweigh concerns: Report ⧉

Economic Times 15 February 2018

Forget killer robots—bias is the real AI danger ⧉

Will Knight *Metro* 3 October 2017

We should be as scared of artificial intelligence as Elon Musk is ⧉

Steven Finlay *Fortune* 18 August 2017

AUDIO/VISUAL

The robots are coming: friends or foes? ⧉

Battle of Ideas 18 October 2014

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