

DG3S41 Research Project (Investigation)  
Tom Woodward  
Insights Report

# How might we encourage smarter lifestyles based on the future of AI & automation?



# What is “AI”?

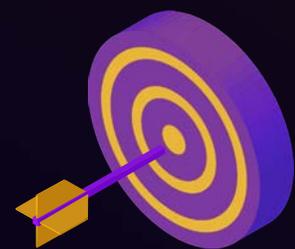
“The fathers of the field Minsky and McCarthy, described artificial intelligence (AI) as any task performed by a program or a machine that, if a human carried out the same activity, we would say the human had to apply intelligence to accomplish the task. AI systems will typically demonstrate at least some of the following behaviours associated with human intelligence: planning, learning, reasoning, problem solving, knowledge representation, perception, motion, and manipulation and, to a lesser extent, social intelligence and creativity.” (Heath, 2018)

## Aims

- To discover the public's perception of AI.
- To discover if and how the media has influenced the public perception of AI.
- To uncover how much trust the public are willing to put into modern technology and if they are ready for a future of automation and computerisation.

## Objectives

- Gather and analyse quantitative data on the public's levels of knowledge, concern, and positive/negative perceptions of AI & automation.
- Conduct qualitative research to gain a deeper understanding into the public's attitudes and perceptions towards AI.
- Determine whether perceptions are associated with age, gender or how educated the public are on AI.

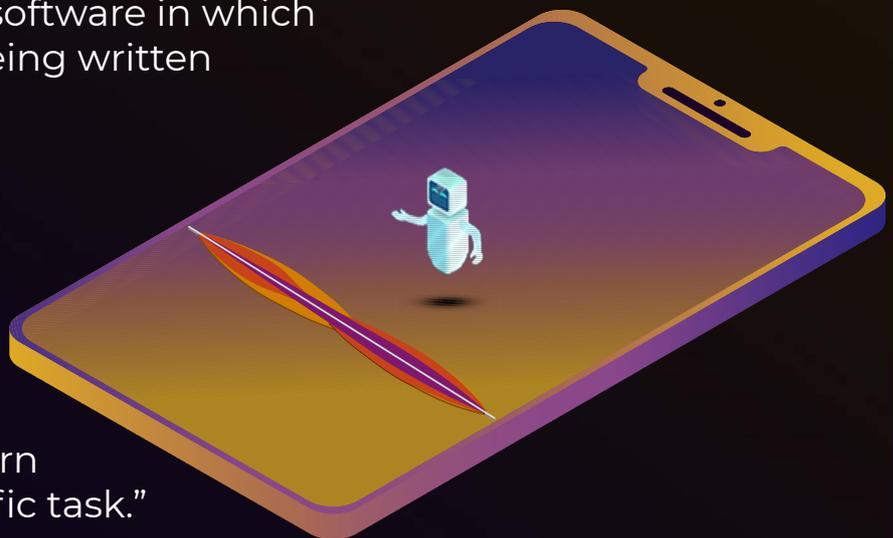


## Why AI?

In a 2013 study called the future of employment: how susceptible are jobs to computerisation? by Carl Benedikt Frey and Michael A. Osborne they estimated that within the next 2 decades, 47 percent of all US jobs are at risk to computerisation. “We are narrow thinkers, we are noisy thinkers, and it is very easy to improve upon us.” (Agrawal, Gans and Goldfarb, 2018)

In order to undergo a study about AI one must first understand what it is and what it does. There is an incredibly large plethora of AI all around us from our smartphones facial and language recognition, smart televisions using Netflix’s and Youtube’s algorithms of recommending things to watch that you’ll be most interested in based on your history, to even the format and software in which this research report is being written on using spellchecking and grammar.

What AI does best is learning; “machine learning is where a computer system is fed large amounts of data, which it then uses to learn how to carry out a specific task.” (Heath, 2018)



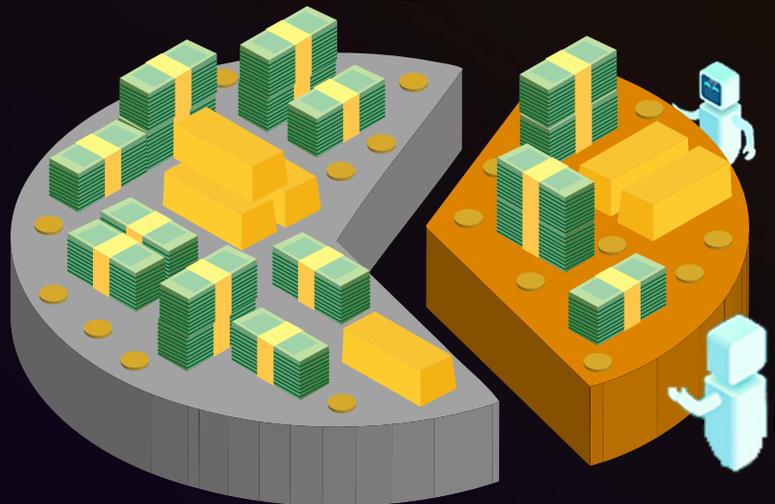
Of course it doesn’t just end there, the more advanced end of the spectrum features AI that are combined with robotics to physically accomplish tasks. Most popular examples feature factory robotics using conveyor belts and robotic arms to adjust or build. However the more innovative examples from tech companies like Boston Dynamics use AI and robotics to create “A research venture in creating the world’s most dynamic humanoid.” (Boston Dynamics, 2019)



“Now comes the second machine age. Computers and other digital advances are doing for mental power—the ability to use our brains to understand and shape our environments—what the steam engine and its descendants did for muscle power.” (Brynjolfsson and McAfee, 2016)

Thirty-five percent of Amazon’s revenue is generated by its recommendation engine, an engine that notices what internet users are searching and recommends them products either on social media or on Amazon itself. Amazon being a great example of a company that is constantly innovating and forward thinking, the Amazon Prime Air is a service that will deliver packages up to five pounds in 30 minutes or less using small drones. (Amazon Prime Air, 2019) Though in an interview with the BBC Amazon’s Tye Brady on robotics replacing humans said “Humans will always be needed” however this is not saying how many humans will be needed.

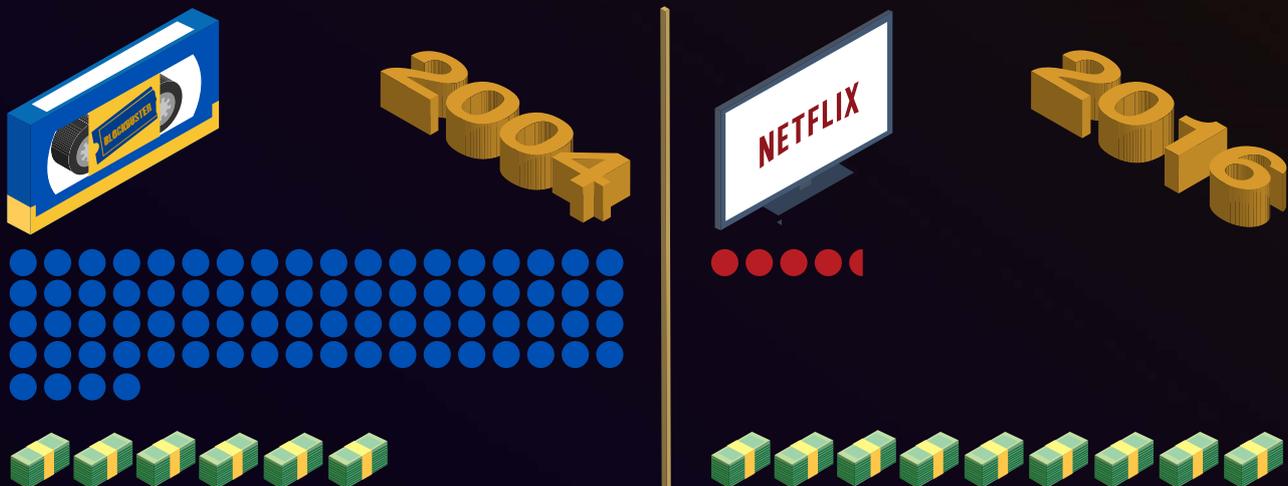
amazon



# Innovation

Human progress is based on the division of labour. As we have advanced over thousands of years, our jobs have become more specialised. Our machines aren't yet good at difficult complex tasks, they are however extremely good at narrowly defined and predictable tasks, this is what destroyed many factory jobs. Look at a complex job for long and hard enough and you'll find that it is just many narrowly defined and predictable tasks one after another that given enough time and data an AI could learn. We are on the brink of machines learning how to out perform us in even our most complex jobs. (Kurzgesagt, 2017)

The internet as an invention is a great example to compare to AI to what it will do to humanity. The internet birthed so many new companies, Facebook, Spotify, Amazon etc. yet killed so many too: Yellow pages, Blockbuster, Toys R Us etc. However it didn't create enough jobs to compensate for population growth or for the industries it killed. (Kurzgesagt, 2017). In 2004 Blockbuster employed an estimate of 84,000 employees and profited \$6 billion dollars compared to Netflix in 2016 that only employed an estimate of 4,500 employees and profited \$9 billion. (Ford, 2016)



In contrast Rory Jones, a technology correspondent for the BBC also analysed a similar report from Oxford Economics claiming “Up to 20 million manufacturing jobs around the world could be replaced by robots by 2030” according to his analysis “at a global level, jobs will be created at the rate they are destroyed.”

“The challenge for governments is how to encourage the innovation that the robots promise while making sure they don't cause new divides in society.” (Jones, 2019)

# METHODOLOGY



In order to answer how the public feels in relation to AI one must collect vast amounts of data from the public. Quantitative research methods will be the best plan to execute, specifically an online survey, to get a generalised knowledge and understanding of views and to help influence and guide the qualitative research, in this case interviews and a media experiment.

## Survey

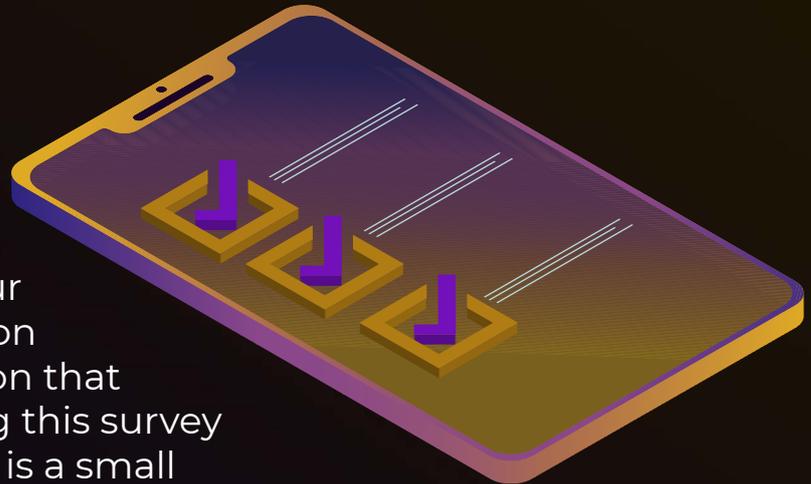
The first method used was an online survey called “Public perception of AI & automation”. It consisted of 10 questions starting with more generalised questions and soon getting to more philosophical ones to uncover participants feelings not just about AI now but how they feel about the future of AI. The survey was conducted online via a website called survey monkey and shared via social media causing there to be 28 respondents 78% of which are in the 18-24 age bracket.

The survey starts with the question “Do you know what AI is? If yes then please explain what you believe it is.” To make sure that people doing this survey at least know what AI is so they can continue, also added the “if yes then please explain” section is to not only understand if respondents know the acronym but also how they explain what AI is.

The second question “Give yourself 30-60 seconds to think of as many examples of AI as you can (whether its real or fiction).” This question was added with the intention of discovering what are the first AI that come to peoples mind when mentioned, what is more popular fiction or reality? And if fiction, can one assume that it is a popular yet evilly portrayed AI like the Terminator (Cameron, 1984)?

The fourth question is a 0-100 slider bar question “What is your current opinion on AI” with 0 being hate, 50 as neutral and 100 being love. Here is an opportunity for participants to be less specific about one AI and how they feel about all.

The fifth question asking participants “Do you use the AI assistant on your smartphone or if you have one in your home? (Alexa, Siri, Google home, Cortana etc.)” with the purpose of finding out how many people use the many voice assist AI’s around us, house AI or even the ones we all have access to in our smartphones. This question is based on the assumption that all respondents answering this survey have smartphones, there is a small possibility that they do not however with this survey being posted on social media, it is most likely everyone answering are on a smartphone.



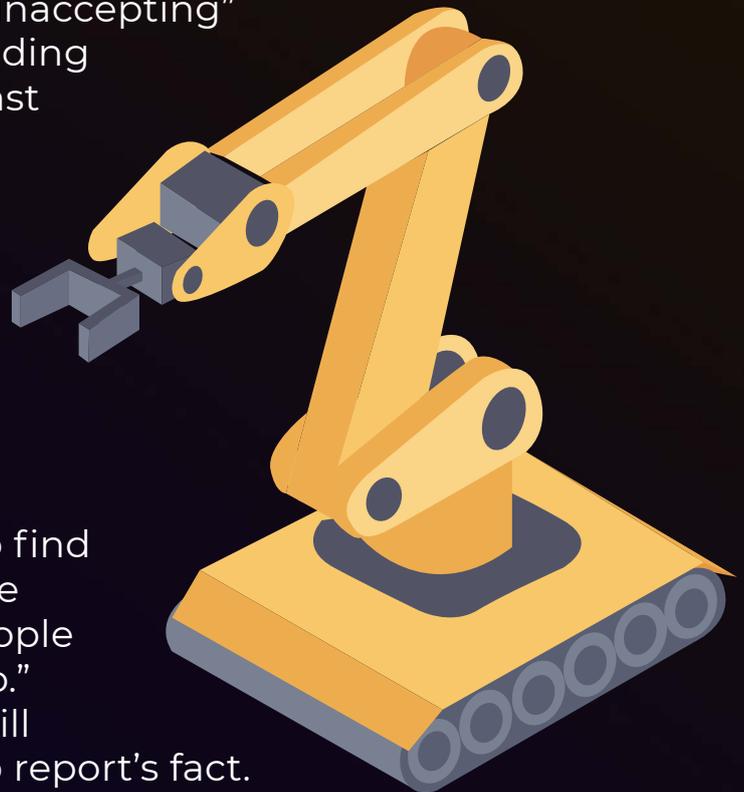
The sixth question was regarding Boston Dynamics viral videos showcasing their new robots integrated with AI “Have you seen Boston Dynamics robotics and AI dev videos?” Alongside a short explanation of the videos, this was to see how many of the participants are up to date with some of the biggest current breakthroughs in science & technology, not only that but often these videos are shared online on social media with comments in one extreme either for or against the future of robotics, so this could have an influence on their perception of AI.

The seventh question was a more situational, philosophical question based off of the new amazon prime air service: “If you ordered something on Amazon and a drone could deliver it to you in a couple of hours or a human could deliver it to you tomorrow which would you pick?” This question was with the intent to find out how many respondents are willing to trust robotics with a real world task rather than a human. In fact what the question is really asking isn’t just do you trust robotics it is also asking do you care for human employment in narrow tasked jobs? Are you willing to sacrifice delivery time to keep another human in employment? Are you willing to adapt to the future?

The eighth question is to keep the same theme as the previous question yet wording it differently: “How accepting are you of a future of AI and automation?” A far more generalised approach to the previous question yet with 5 answers instead of 2, to see where people are on the scale from “very accepting” to “neutral” to “very unaccepting”.

The final question was intended to be very situational and philosophical, made to give a better understanding of today's societies real views on the real future of AI & automation: “Let's fast forward 15-20 years into your future and your boss lets you go to replace you with an AI who can do your job faster, more efficiently, & is much cheaper, how do you feel?” The answers similar to the previous question vary from “very accepting” to “neutral” to “very unaccepting” but the answers were re worded to better fit the situational question, so “very unaccepting” is now “Very angry, I will be leading the unemployment riots against the machines” this possible answer is used as humour and realism of there being real unemployment strikes and riots against automation.

“According to a McKinsey Global Institute study between 400m and 800m people could see their jobs automated and would need to find new jobs by 2030. However, the Gallup report, showed that people rarely fear to lose their own job.” (GoodAI, 2019) This question will hopefully challenge the Gallup report's fact.



## Media Experiment

Since the media around us plays such a large part of the public's views and opinions on anything and everything, science fiction cult classic films such as *Blade Runner* (Scott, 1982), *The Terminator* & *2001: A Space Odyssey* (Kubrick, 1968) left a lot of its viewers from the '70's, '80's & '90's very afraid of what AI will one day be, these are just some of many examples of how AI has been used in mass media storytelling as the villain. Whereas today there is a far wider range in representation of AI, to use *Avengers: Age of Ultron* (Whedon, 2015) for example, a film that made one and a half billion dollars and was a huge popular culture event, both one of the protagonists and the antagonist are AI characters, showing audiences how AI can be used for both good & evil.

I decided to use different examples of AI and sci-fi from popular culture to conduct an experiment on a range of participants. I chose to use modern films (2010-present) centred around AI. I organised a list of films fitting this category and placed them in order of their representation of AI from malicious to good and from this spectrum 3 were picked, 1 representing each extreme.

Three participants were selected specifically for their current views on robotics and AI. Joseph Pugh, male, 21 years old is accepting of an AI future, Emily Dyer, female, 20 years old is neutral and Nadia Soufi, female, 22 years old is slightly unaccepting.

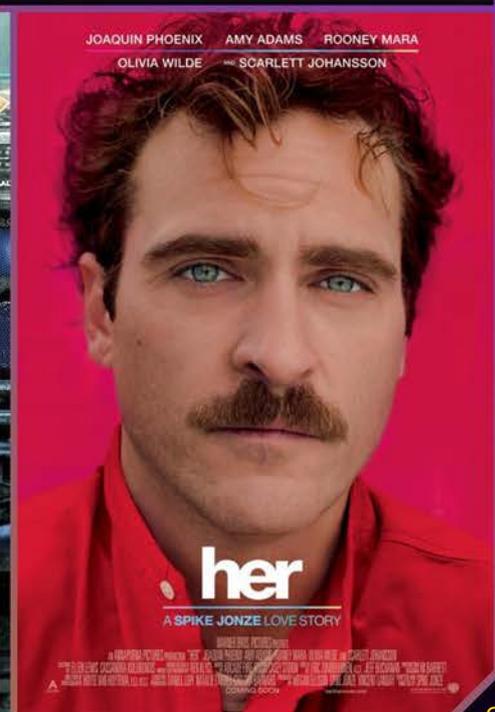
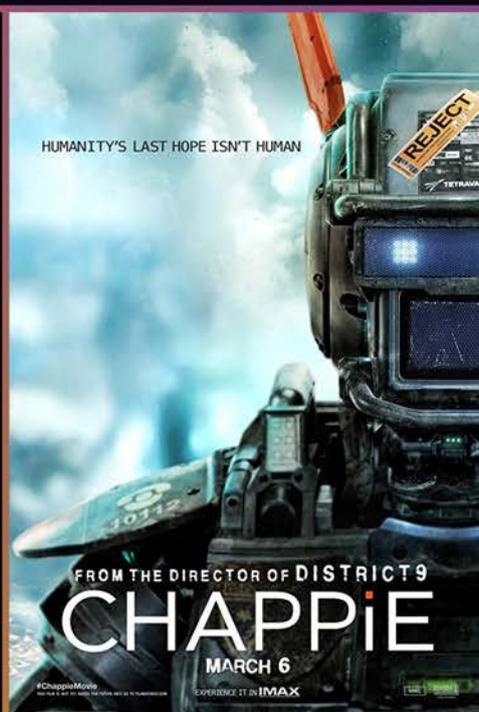


The first film selected for the experiment was Ex Machina (Garland, 2015) a sci-fi thriller about a young programmer as part of a strange scientific experiment where he is expected to assess AI by interacting with a female robot, which then uses his emotions against him as a means to escape. This example is used as the malicious example of AI, since the ending sees her/it kill its creator and escape.

The second film is Chappie (Blomkamp, 2015) a sci-fi action film where one of the police robots, is stolen by criminals who treat it like their own child. With new programming, it becomes the first robot with the ability to feel and think for itself. This is used as a neutral example since the AI main character is Chappie a positive example for AI however the film also shows examples of military robotics being abused and corrupted by villains.

The final film is Her (Jonze, 2013) a sci-fi romance film in which an introvert writer, buys an AI system to help him write. However, amazed by the AI's ability to learn and adapt, he falls in love with it. This is used as the example for good since the AI improves a man's life and wellbeing exponentially.

The aim of this experiment is to see if having seen certain representations of AI in popular media will change one's opinion or at least open their mind to the many possibilities of the future and what AI has to bring.



## Interview

In order to gain a better insight into the public perception of AI, semi-structured interviews were conducted with 3 participants chosen specifically based on their range of age, gender & opinions on AI. Participants were interviewed using questions informed from prior research and answers were recorded by note-taking.

Unstructured interviews usually produce results that cannot be generalised, but they provide a more in-depth understanding of participants' perceptions, motivations and emotions.

Mark Woodward a 54 year old, male, brick layer and husband was interviewed via online video call whilst in the comfort of his home, selected for his representation of the older communities who grew up watching Terminator and doesn't trust modern technology.

James Lazarus a 7 year old, male, student was interviewed in person in his home selected to represent younger communities and for his optimistic approach to modern technology since he is growing up with it. (Image, right middle, is not James Lazarus, since no photo or permission for photo was given)

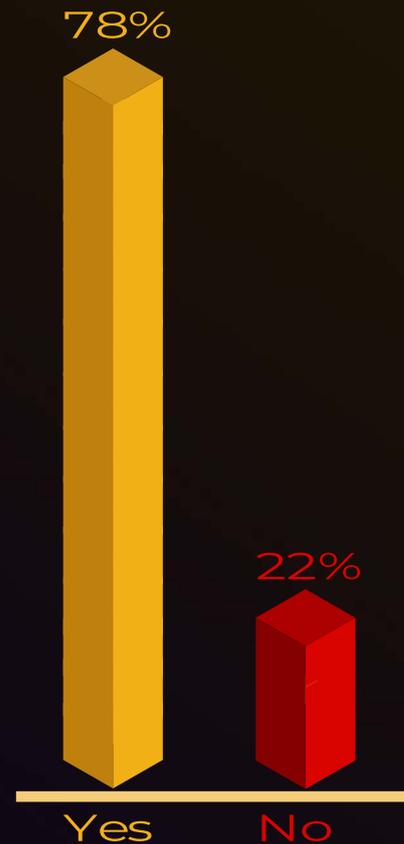
Flavie Guyonvarch, a 18 year old, female, student from France was interviewed in person in her own home selected to represent a community of those who have grown up with technology but are uneducated on what it is.



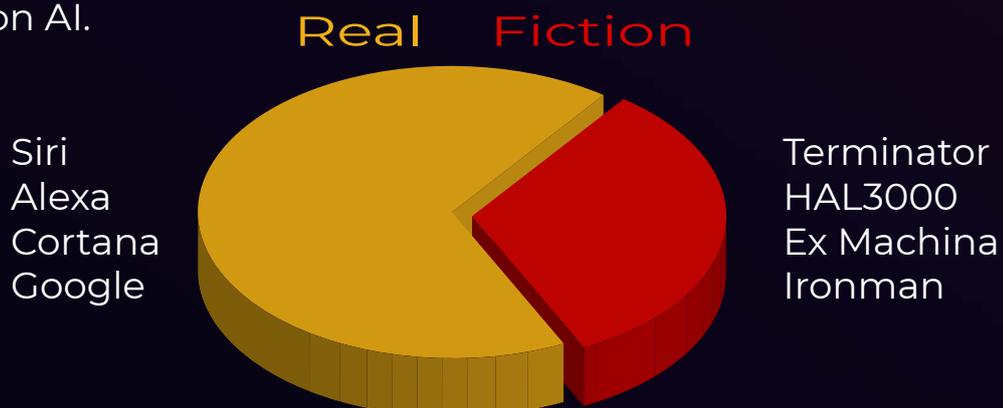
# RESULTS & DISCUSSION

## Survey

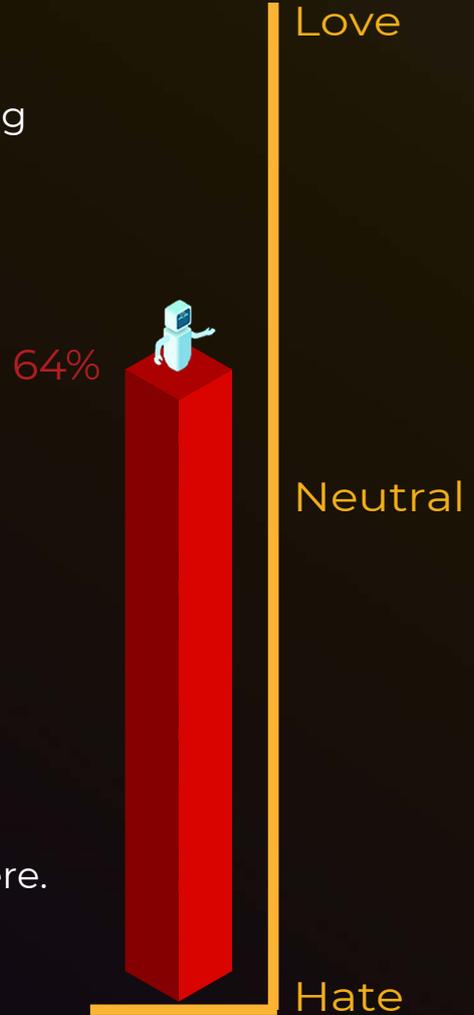
The results from the survey were surprising. The first question 22% of the respondents did not know what AI is. By being able to select these 6 respondents I could see their specific answers for later questions. For example respondent #19 answered no to knowing what AI is however later they answered yes to using both the AI on their smartphone and in their home, which in order to be able to answer that question they must know what an AI is. Not only that but this asks the question whether 22% is a true representation of people who do not know what AI is?



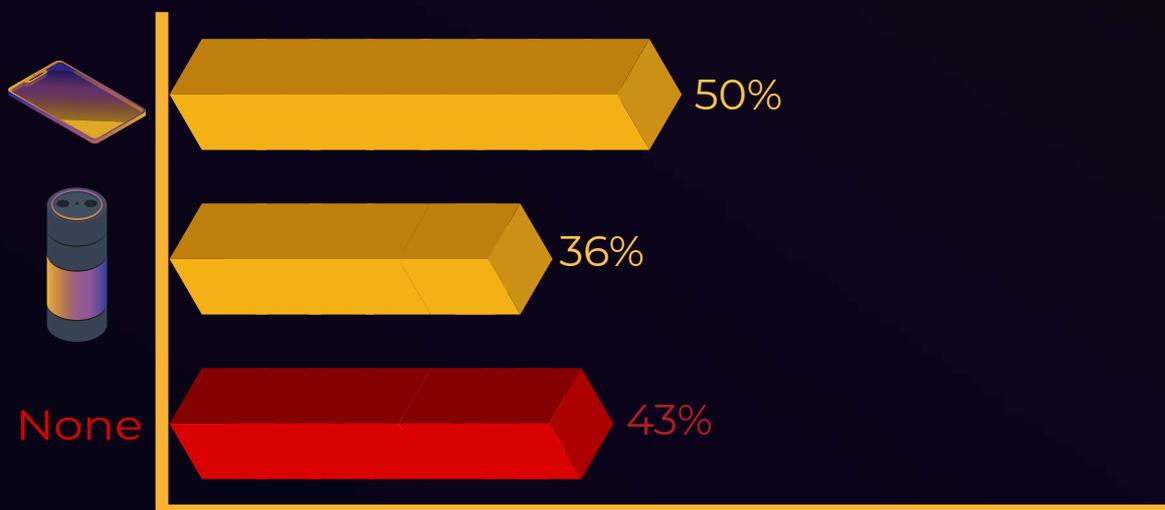
The second question of the survey asking respondents to **give examples of AI** also gave me an interesting result. I was expecting the majority to be media fictional influenced however most respondents gave real world AI examples. I then split these examples down into 3 pie charts, the first being the real against fiction ratio then the next 2 charts breaking down each of those sections, Terminator being the most popular fictional AI and Siri being the most popular real AI. I was surprised to see the publics knowledge in real world AI from some respondents even mentioning facial, vocal & fingerprint recognition AI.



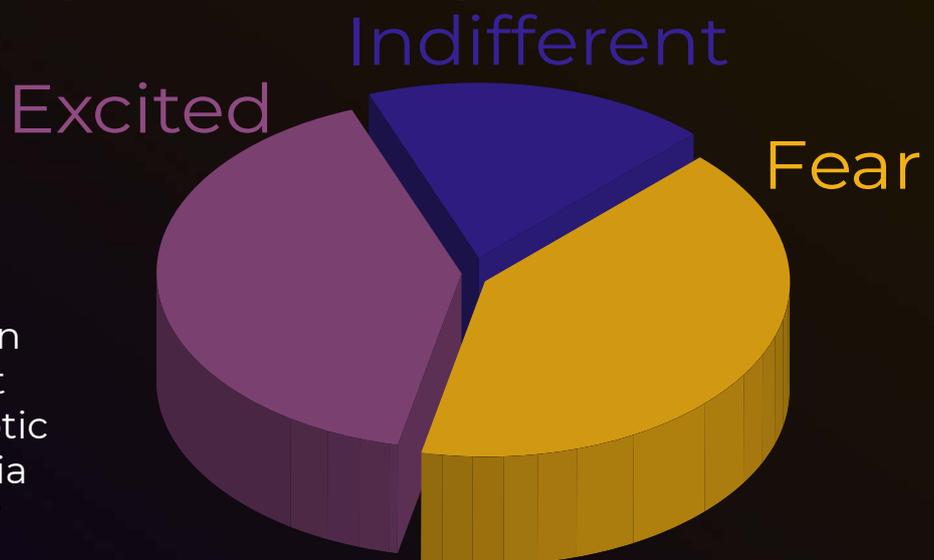
The next question asked was a slider question "What is your current opinion on AI" and the answers here were interesting that the majority were either positive or neutral towards AI with the lowest answer being 29 and the highest being 100 with the average calculated to being 64%. This helps show extremes for example Only 2 respondents answered with a number lower than 50, upon closer observation to respondent #2 who answered 29% to this question I was confused to see their answer to later questions being that they would trust the Amazon drone delivering them the package and that they are somewhat accepting to the future of AI. This could possibly be due to not yet trusting AI but thinking it will get better in the future or possibly misunderstanding the question here.



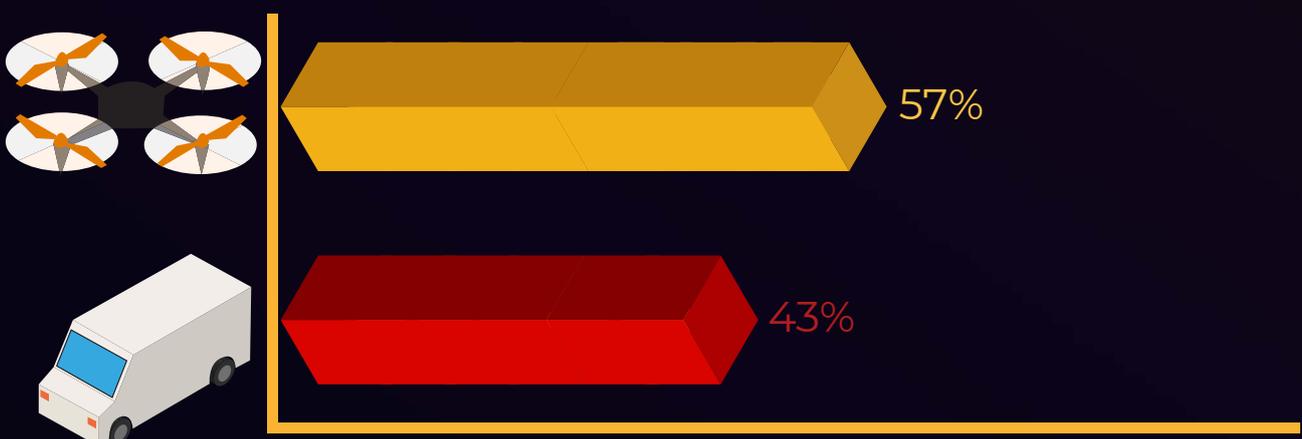
The fourth question asked respondents whether they use the AI assistant on their smartphone or if they have one in their home, a lot more respondents than I was expecting answered yes to both the smartphone and home AI, however there are still 43% that do not use the AI's at our disposal. This could be a problem in itself to solve by trying to get more people to use the AI's we already have. At this point one could split the respondents into two categories those who are adapting to the future technology around us and those who are not.



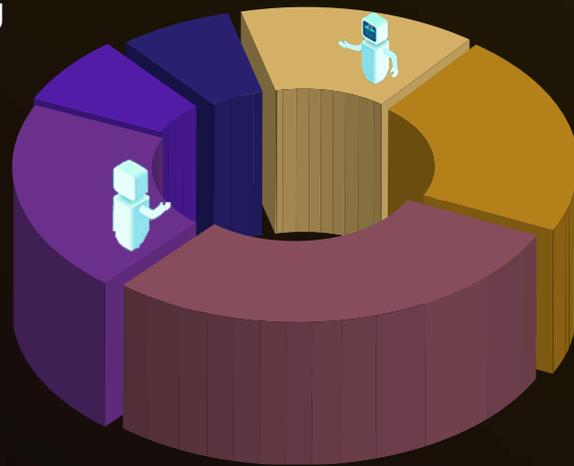
The fifth question asked respondents **whether they have seen Boston Dynamics robotics and AI development videos**, followed by an explanation of said videos. 18% of respondents had not seen the videos so for this question I decided to focus on those who have seen the videos with a pie chart. The majority are either excited or indifferent about the future of robotics, this correlates with my previous questions identifying whether the respondents use the AI around us and how they feel about AI. Though the problem at hand here is not those who look forward to it, it is in those who fear it, the 18% who fear the future of these types of robotics need to be further questioned in more detailed about why they fear a robotic future. Has the media influenced this fear?



The next question I believe directly matches the data shown before it, the question being whether the respondent **would prefer a drone to deliver their package in a couple hours or a human to deliver the next day**. With the exact same number being 43% of people not supporting the technology around us and in our close future and the 57% supporting it. This question unlike the previous one is less directly about fear but simply just whether people are willing to put their trust and support in an AI to deliver their purchased goods. Are the 43% choosing human with the disadvantage that they get their package the next day because they want to keep humans in employment or because they don't want to accept the change that the future brings?



The eighth question “How accepting are you of a future of AI and automation?” Yielded a further depth to the previous question of the drone and the human, accessing further insight into those who are accepting of new technology on a scale from very to somewhat of how accepting they are and those between unaccepting to neutral the other end of the scale. Similarly to the information I have gathered thus far the accepting side of respondents take up 64% whilst the neutral to unaccepting side take up 36%. Being less situational and more direct I thought it would yield very different results to the other questions yet it hasn't thrown any respondents off by being so direct, it has however given me a deeper insight. Why are 14% unaccepting? This is what I want to find out in my quantitative research.



Accepting Neutral Unaccepting



The final question “Lets fast forward 15-20 years into your future and your boss lets you go to replace you with an AI, how do you feel?” Was intended not to see peoples emotions reacting to the situation of them being replaced by a robot like how it is worded but instead to see out of those who are going to be taking action rather than searching for new jobs. When being replaced in your job the obvious reaction is to be angry so I predicted most respondents choosing the angry option but out of those angry, how many would be choosing to move on and adapt to the future (in this situation with it being a bit more forceful) and how many are willing to riot to get back their job? 21% are willing to strike against the machines taking their jobs which to me raises to many questions. Are they educated enough in their knowledge of the future? Are they fighting for their job back because they love their job or because they love the idea of having a job? What can they do now to put themselves in a different job that won't replace them with an AI in the next 2 decades?



# Media Experiment

The results for the experiment exposing participants to AI centred films is organised into tables per question asked. I felt this would be the best way to organise answers and I will talk about specific quotes from the conversations afterward and analyse the tables.

What did you think about the film? Rate it from hated to loved

			
	Liked 	Liked 	Loved 
	Liked 	Neutral	Neutral
	Neutral	Dislike 	Liked 

How do you feel about the way the technology was displayed in the film?

			
	It looked amazing but realistically would be scary	Felt more realistic because its so similar to Boston Dynamics	Realistic because its so similar to the AI in houses already
	Robots should not look like humans	Was hard to connect with the technology because of the jokes	Was cool, felt very Black Mirror
	Too good looking was scary to think realistically	Felt exaggerated, for the technology level surely it would look a lot more modern	Hard to say since it was just a voice, but realistic for sure

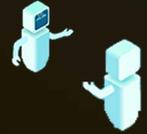
## How would you feel if this technology existed today?

			
	Hope it is friendly back towards its creators	Its good to use in police against bad guys so real people don't get hurt	Would help a lot of lonely people, which the world has loads of at the moment
	Scared	The robots were friendlier than some police now, I'd like that	Nobody would talk to each other anymore if they all prefer talking to their homes
	Would be awful, nobody would talk to each other anymore if they all talk to robots	Would be used for evil somehow	A lot better limiting it to voice, people would feel less threatened by the possibilities

One of the best debates to come out of this experiment was whether AI would actually be able to help solve loneliness or only further cause it, which in itself is a great problem to solve. More great points were brought up when participants were asked about the visuals of the AI, did the AI in Ex Machina make it look more or less friendly because it was a human body in comparison to Chappie very evidently being a robot body (even though it was humanoid) did the fact it had no skin, mouth and eyes add or take from the illusion? Which lead to another debate comparing the voices used being human like in Ex Machina and Her compared to Chappies more robotic talking. Discussions were made over what would make people feel safest or less awkward around but it would require much further research to come to a conclusion of whether faces and voices make AI more comfortable to be around or not.

What was learnt from this experiment is that people are a lot more comfortable with non mobile voice based virtual assistants rather than physical robotics that are mobile. Or is this perhaps due to the participants being new to robotics and AI, if this is to be researched further, real AI should be used to compare one another instead of using films.

# Interviews

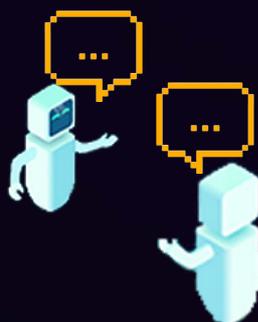
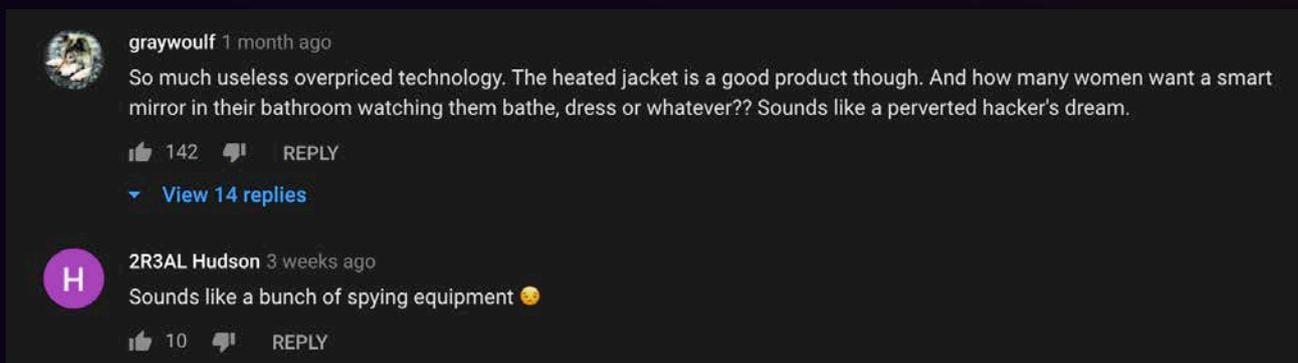


The interviews conducted were 5-10 minute semi-structured conversations to get interviewee's opinions on AI, I wanted the conversations to be kept semi-casual to keep interviewee's from feeling awkward to guarantee the information given to me was legitimate.

Mark Woodward was the first interviewee who spoke of a story of his friend in which £11,000 was stolen from him recently because the thieves phoned his wife, acting like the bank and knew everything about their account details, all they needed was the PIN, since she was in a rush and trusted that the man ringing her was with the bank she gave away the details causing them to steal the money. Mark doesn't trust AI not because of the AI themselves but how he believes anything can be hacked by people with malicious intent.



The problem here isn't in peoples trust with AI, it is their trust in technology as a whole and in my research online I found a lot of people commenting the same opinion about virtual assistants and new breakthrough technology in houses being "Spying equipment". The following photos are comments taken from a YouTube video showcasing new innovative technologies, further supporting Marks statement and later Flavie's. (Future Tech, 2020)



James Lazurus was the second interviewee who's idea of the future of robotics is being very based off of popular media, Marvels Ironman & Avengers franchises in particular, given that he is 7 years old one would expect this, however he is in the very positive mindset that our problems in the world like pollution, climate change and cancer will be solved by the help of AI working with humans. It was encouraging to see such a young persons views being so positive of AI. However when asked why he has these opinions he couldn't directly answer them (partly due to his age) but also because the only way he knows what AI is, is from exposure to popular media. This also raises the problem that are they teaching kids about AI at the right age in school if at all? I asked James if they teach him anything in school about AI and he told me that they have not.



Flavie Guyonvarch was the third interviewee who told me their opinion on AI was, to summarise, that she doesn't know enough to comment too much on it, the only AI she could think of was the "one in her phone". This raises the question similar to the one brought up from James of how educated on AI she is and whether anything about it was ever taught to her in school or college? Which apparently it was not. There are hundreds of resources on the internet to learn about AI but is it yet considered necessary to teach it in schools? Especially since we are moving into a future of AI.



Upon further conversation with Flavie, after explaining AI to her she told of a rumour she heard how home AI technology, especially those with cameras recognise ones living area and subtly advertise items on their social media feeds recommending things based on your conversations that it listens to even when you are not directly talking to the AI. Agreeing with Marks point about the confusion of home AI being used as "spying equipment" to either want people to spend more money on for example Amazon, or like the other example Flavie brought up in our conversation it being similar to a Black Mirror (Brooker, 2011-present) episode in which hackers blackmail society members based on their viewing history and what they do in front of their cameras assuming they are turned off, further fuelling peoples fear in modern technology.

# CONCLUSION



This research aimed to identify the public's perception of AI and gain a better understanding of public generalised knowledge on the topic and its future. Based on quantitative and qualitative analysis of research gained it can be concluded that within the public there are fears and misconceptions of the security of AI technologies and a missing education on what AI is.

To revise my initial research question I would rephrase it to:

**Modern Technologies: how might design thinking be utilised to encourage a positive mindset change towards technology for good?**

However further research is needed to determine the relationship between misconceptions of technologies security and education gaps in AI. I believe this research project has been a success and I have uncovered a lot of opinions on AI helping shine a light on the more precise modern problems the main one being people's trust in the security of the cameras and microphones that these modern technologies bring.

