



ARTIFICIALLY INTELLIGENT

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TRENDS

“Nobody phrases it this way, but I think that artificial intelligence is almost a humanities discipline. It’s really an attempt to understand human intelligence and human cognition.”

- Sebastian Thrun

“A year spent in artificial intelligence is enough to make one believe in God.”

- Alan Perlis

INTRODUCTION

Artificial Intelligence is, broadly speaking, one of the most enriching and comprehensive technologies being developed today. Google's CEO, Sundar Pichai, describes it as *'even more important and more influential than the discovery of electricity or fire.'*¹

In a recent TV release, the Russian President, Vladimir Putin, said: *'artificial intelligence is the future, not only of Russia, but of all of mankind. Whoever becomes the leader in this sphere will become the ruler of the world.'*² In reaction, the successful entrepreneur and scientist, Elon Musk, answered that *'competition for AI superiority at national level (will be the) most likely cause of World War 3.'*³

A BASIC UNDERSTANDING OF THE DIFFERENT CONCEPTS

Although there are a multitude of terms available to describe the developments in robotic technologies, it is necessary to briefly distinguish between the most prominent terms.

The three terms below are mostly used to describe the movement of automatized technology that can function independently.

'Artificial intelligence'

The ability of any technical or technological device to understand and interpret its own context, and to take such steps as will allow it to realise its goals.

'Virtual reality'

Any image, sound and/or other sensory simulation that creates the impression of a real context that exists elsewhere, but can be experienced here and now.

'Machine learning'

The ability of artificially intelligent devices or technologies to learn from their virtual experiences and adjust their action accordingly, without necessarily being programmed to do so.

EXACTLY HOW DEVELOPED IS THE TECHNOLOGY REALLY?

Although AI in its most basic form already manages and controls every form of technology (think of the algorithms used when you search for specific photos or graphics on Google), there are specific incarnations of AI that rise above our everyday understanding of the concept.

These are the forms of AI technology with the ability to form our perceptions, as well as passionate opinions, about whether they are good or evil.

Forecasts predict that a specific AI persona will be developed within the next 25 years that will intellectually know more than any person alive. Within the next 50 to 100 years an AI will be developed that will know more than the entire global population at that time.

Just to give you an idea, here are some of the most recent developments in the world of artificial intelligence:

1. Some of the AI technologies used by Mars Rover are already so complex that scientists don't know why he makes certain decisions, and they can't predict it either.⁴
2. The Google AI supercomputer, NASnet, recently acquired the ability to build AI systems of its own, which are significantly more complex than anything currently made by humans.⁵
3. The IBM Hursley Innovation Centre's research shows that, within 20 years, we will have the ability to inject artificially intelligent nano-robots into our bloodstreams to heal our bodies from the inside out.⁶

Here follows a short description of the biggest role players in the current sphere of artificial intelligence.

Sophia the Robot

Hanson Robotics is perhaps the world's most infamous forerunner in the development of AI technology in robots. When Hanson first introduced Sophia the Robot to the world, their aim was to 'humanise' the AI technology behind her comments and reactions to such an extent that we might get a glimpse of what the future may hold. Another potential outcome was that Sophia would become the 'face' of AI over the world, and that she would ensure ensure a more generally accepted spot in the general public's hearts for the AI community.

Although initial reactions were positive [*Business Insider* published an interview with Sophia in which 100% was handled by the AI technology], later critique was harsh and to the point.

Facebook's head of AI research, Yann LeCunn, calls Sophia the Robot's existence a complete lie and a trick by Hanson to mislead the public about how developed AI technology really is.

His critique was justified when it was revealed that most of Sophia's tweets [yes, she has her own Twitter account] were written by Hanson Robotics staff and not by Sophia herself.

Google DeepMind

The DeepMind project initially aimed to see how complex an algorithm-based technology could become in the application of video games.

DeepMind was initially formed by a British company, and later acquired by Google.

At the moment, DeepMind is so effective that the world champions in certain games aren't able to win against the computer. Part of DeepMind's success lies in its ability to develop short-term memory, similar to that of the human brain. DeepMind also has a successor, already developed and completed, with the name AlphaGo, which is even more powerful and intuitive than DeepMind.⁷

Of course, the area of games isn't new in the AI conversation. This year marks 21 years since the chess master, Gary Kasparov, was beaten by the IBM computer named Deep Blue in 1997.

His experience with Deep Blue convinced Kasparov that computers will always reach a limit in their technological development, but that their intelligence and decision-making abilities will equal and eventually surpass that of humans. He describes his experience and knowledge in his new book '*Deep Thinking: Where Machine Intelligence Ends And Human Creativity Begins*'.⁸

IBM Watson

Perhaps the most famous AI persona is IBM's super computer named Watson.

The latest development in Watson's ability is its incredible 'tone analyzer'. It helps the computer to read and analyze emotional undertones in voices or even text communication, and to act accordingly. In his article about this phenomenon, Tristan Greene writes:

*"In one version of Watson's 'Tone Analyzer,' built as a general-purpose service, it understands 13 unique human "tones" or ways we express ourselves. The other version features a more focused one, it's only worried about seven. These are the tones IBM feels are most important to a customer service agent and include: frustration, satisfaction, excitement, politeness, impoliteness, sadness and sympathy."*⁹

For the first time, the computer is now a viable option in roles such a service delivery consultant, therapist or 'friend'.



Self-driving cars

With the two tech giants Über and Google at the helm of the 'autonomous driving revolution', it is possible that we will see driverless cars on our roads fairly soon.

This application is certainly the most practical and realistic application of AI in our world today. In certain approved areas in the USA and elsewhere, there are already fleets of driverless cars ferrying passengers to and from their destinations.

The moral issues surrounding these applications were until recently one of the biggest reasons why the technology couldn't be made available on commercial level. Building an AI that will in a split-second decide between protecting the lives of its passengers or that of a person who stepped into the road right in front of the car, remains a difficult task for the writers of the algorithms.

THE PUBLIC PERCEPTION OF AI IS ROOTED IN THE SCIENCE FICTION GENRE

Since the birth of the science fiction genre there had been talk of evil robots plotting the demise of their human creators. The idea that a piece of man-made technology becomes self-conscious and then turns its back on its makers, is one of the most-used science fiction storylines in the history of the modern entertainment industry.

We see this very story, step by step, in films such as Terminator, The Matrix, Transcendence, Ghost in the Shell, Lucy, Morgan and the most generally known Avengers: The Age of Ultron.

In almost every one of these narratives, a predictable storyline is used:

- Humans develop an artificial intelligence persona.
- The purpose of the AI is to destroy evil powers.
- Before long the AI realises that humans are actually the most evil of all.
- The logical conclusion is then that humans should be destroyed.
- And then a full-scale war erupts between man and machine.

CAN AI MEAN THE END OF HUMANITY? SOME PEOPLE THINK SO.

Perhaps the most prominent critic of AI developments is the well-known astrophysicist, Professor Stephan Hawking. His widely publicized statement about AI technology states that 'artificial intelligence is either the best thing or the most fatal thing to ever happen to humankind. Unfortunately, by the time we figure out which one it is, it will be too late to stop the momentum of AI.'¹⁰

Hawking's most loyal supporter is Elon Musk – the owner of high-tech companies like TESLA and SpaceX. He even goes so far as to say that AI development is more dangerous to humankind than the nuclear weapons of North Korea.

Musk has on several occasions warned against the potential dangers of AI, and regularly calls it humankind's biggest existential danger. His organisation, Open AI, aims to monitor and structure artificial intelligence worldwide in such a way that it won't lead to the final destruction of our global community.¹¹

Even Guy Pearce, the star of the new movie Donny the Drone, is mindful of the possibilities of technology, especially the potential implications that it holds for humans. About the eventual effect of AI on humankind, he said the following:

"I do think that society's fear about it is valid," he says. "I think probably it's complex and it's confused, because it's also infused with the excitement about potential and possibility. But you look at how depressed the world can be, how much we're destroying in the world, on this planet, on this green and blue planet that we live on... so all of this wonderful technology we're creating, we know that we're destroying ourselves with it."¹²

On the other side of the spectrum we find those with a more tempered view of the potential dangers of AI. YouTube CEO, Susan Wojcicki, says that although we should be careful in which direction we send the development of AI, there is nothing to be worried about. She added that as people learn more about how technology works, their fears will decrease.

"I'm not personally scared, just to get that out there, and I think it's because I have a better understanding of what AI is."¹³

ARTIFICIAL INTELLIGENCE AS A RELIGION

One of the most fascinating effects of artificial intelligence on humans is symbolised in the language that technical workers use when they refer to 'an' AI – as if it is a specific person, identity or character.

Talking about artificial intelligence as an abstract concept doesn't make sense unless it is embodied in a specific computer, algorithm or software program.

It was therefore only a matter of time before someone would develop the need and ability to build a specific AI persona that would serve as a godly being that monitors and advises humankind.

This person's name is Anthony Levandowski, and his non-profit organisation named The Way Of The Future's mission statement reads as follows:¹⁴

"To develop and promote the realization of a Godhead based on artificial intelligence and through understanding and worship of the Godhead contribute to the betterment of society."

Of course, Levandowski's story isn't the first in which AI is discussed in a religious context. The idea of a technological Upper Being has been a discussion point amongst scientists, technologists and philosophers for decades.

Vince Lynch described the general similarities between artificial intelligence and organised religion as follows:

“Teaching humans about religious education is similar to the way we teach knowledge to machines: repetition of many examples that are versions of a concept you want the machine to learn. There is also commonality between AI and religion in the hierarchical structure of knowledge understanding found in neural networks. The concept of teaching a machine to learn, and then teaching it to teach (or write AI) isn’t so different from the concept of a holy trinity or a being achieving enlightenment after many lessons learned with varying levels of success and failure.”¹⁵

AI IN OUR MIDST

Although most of the AI developments happen in the international arena, especially on the front steps of the super powers, there are still implications for South Africa and the people who live here.

As the technology reaches and crosses our borders, we’ll see specific consequences unique to our African economy and cultural climate.

Ralph Hamman, professor and research director at the University of Cape Town’s Business School, names three specific considerations related to the implementation of artificial intelligence in a South African context.¹⁶

Increase in joblessness

Although new technologies will always cause a mild panic with those who currently have jobs, artificial intelligence has the ability to eliminate entire human workforces in some industries.

“What’s perhaps different now is that the new, interconnected digital technologies will likely have a broader and more far-reaching array of abilities. And so the prospect of new kinds of jobs may well be diminished or limited to increasingly sophisticated domains, such as machine learning.”

New skills that are more applicable to workers who will have to share the job market with robot colleagues, should be taught and learned. These skills include the types of characteristics that algorithms can’t necessarily reproduce, for example: creativity, innovation, relationship management and empathy.¹⁷

Bigger concentrations of wealth and prosperity

Because the newest technologies are usually controlled by the wealthiest companies and individuals, it follows logically that they will also be the first and most immediate beneficiaries of the advantages of artificial intelligence.

This also means that the rich will likely become even richer, and those at the other end of the economic spectrum will become poorer.

Hamman adds: *‘New technologies’ advantages for capital are not just due to increasing productivity, but also because they allow new business models that may control or even dominate entire sub-sectors and stifle competition”.*

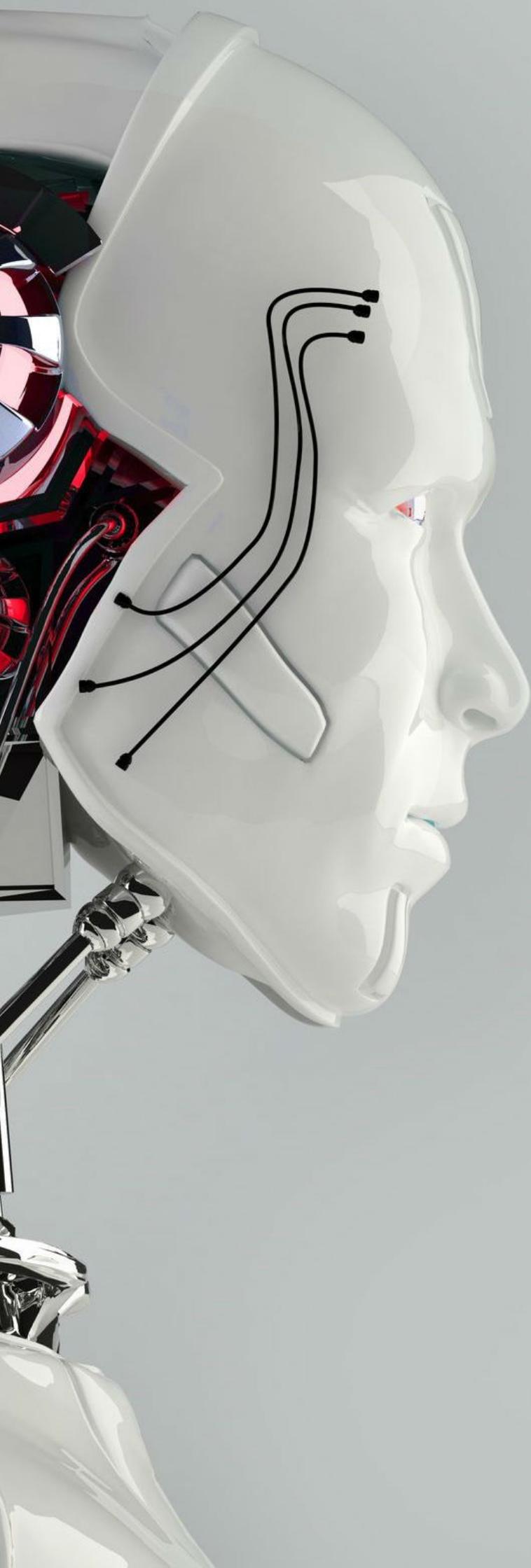
Biased algorithms

The decision-making and learning processes of a being largely reflects that of its creator. This means that the writers of the AI algorithms project their own biases and preferences into the artificial intelligence technologies that they develop.

Because most new technologies are developed in developed countries, it will inevitably include cultural and inherent aspects that don’t represent a third-world society and that these societies won’t understand.

An excellent everyday example of this is how AI struggles to understand any accent apart from the British or American varieties.

“Of course, the promise is that AI will enable such systems to learn to address such issues. But the learning process itself might be influenced by racial, gender, or other prejudices.”



WHAT ARE THE BIGGEST PRACTICAL, MORAL AND ETHICAL IMPLICATIONS OF AI?

As part of the Google DeepMind development, Google also took the lead in assembling a board to find and discuss any possible ethical and moral issues in the development of the technology. Although the exact composition of the board is still one of the best-guarded secrets in the world, we know that representatives from Amazon, Google, Facebook, IBM and Microsoft are part of it. The name of the board is the 'Partnership on AI' and it exists to explore the interaction between AI and general society.

Revolution of the workplace

As seen above in the discussion on the effects on South Africa, the revolution in the workplace caused by artificial intelligence is also an international phenomenon.

One of the greatest fears in terms of artificial intelligence is that it will automatize the functions of the 'blue collar' industries and leave masses of people instantly jobless. The fear that robots will one day do my work better than I can ever do it, is not a new threat, but it is still one that is becoming more and more realistic as the technology evolves.

On the other hand there are a handful of technical industries that will grow and benefit from the expansion of artificial intelligence. These jobs are very technical, specific and specialised. It includes:

1. Data scientists
2. AI engineers
3. 'Data labelling' specialists
4. AI hardware specialists
5. Data security staff

The desire for self-knowledge and self-understanding

In the words of Demis Hassabis [DeepMind Technologies]:

*'Attempting to distil intelligence into an algorithmic construct may prove to be the best path to understanding some of the enduring mysteries of our minds.'*¹⁸

Our need to understand ourselves comes to the fore when we accept the right to reinvent ourselves in a second, better version. Nikhil Jain and his company ObEN chases the goal that every person on earth will have a second, digital version of themselves soon. This 'second you' works independently of yourself, but is programmed to, like you (hopefully!), converse with others, make decisions, do shopping and for all

with others, make decisions, do shopping and for all practical purposes, lead an independent online life.

Jain explains it as follows:

*'We believe every person in the world will eventually have their own copy. One that looks like them, talks like them — it's not that far off. An AI-driven virtual copy that can be used by consumers like us in day-to-day applications. For example, my AI — my copy — can now sing better than me.'*¹⁹

It is, however, very interesting and even ironic that AI technology is already so advanced that the managers of specific AI's sometimes find it impossible to pinpoint why software make certain decision or what data it based these decisions on. This can have drastic consequences in situations where AI is used in military or similar contexts.

*'But there's a core problem with this technology, whether it's being used in social media or for the Mars rover: The programmers that built it don't know why AI makes one decision over another. Since the changes throughout those millions of connections were so complex and minute, researchers aren't able to exactly determine what is happening. They just get an output that works.'*²⁰

Perhaps people feel that if we can succeed in making a true copy of ourselves, we will finally be able to know and understand ourselves fully. This is also in line with what the well-known philosopher, Plato, said so many years ago:

'The first and greatest victory is to conquer yourself.'

This brings us to the third implication: our need to create new life.

The need to create new life

Since the days of Dr Frankenstein, people have been fascinated by the possibility of creating a life like their own – one which is intellectually and emotionally self-conscious and can exist independently.

The development of artificial intelligence is a perfect hit for those who believe that creating new life will soon be just another one of humankind's many technological abilities.

Back to Guy Pearce and his film about Donny the Drone – Pearce accurately summarises one of the most distinct characteristics of the AI movement as follows:

"I think we have this very dark and strange compulsion to reproduce ourselves," he says. "And not just in the natural way of having children but in the idea of

creating a robot and being able to communicate with that robot, and then have that robot do things for us."

It may also be that, as humans begin to create new 'life' through the development of artificial intelligence, that artificial life will in turn reshape and reform humans' way of life. In a recent article in Fast Company magazine, the author writes: *'...artificial intelligence is shaping not only how we think, but how we see ourselves.'*²¹

The irrational and illogical concept of grace

Because of the binary nature of any algorithm it is nearly impossible to create artificial abilities that can understand and interpret the dualistic concept of paradox.

The code of 'if this, then that' is the basis DNA of any effective AI technology. The effectiveness of an advanced AI persona is dependent on its ability to identify cause and effect, to link it and to take the necessary steps that follow it.

Just as these abilities make the technology very effective in the areas of technical applications, it is also very dangerous in terms of moral and ethical issues. In these areas cause and effect aren't always so clear, and it can happen that the chosen outcome doesn't require a clear-cut approach, but rather the artificial ability to work through the grey areas to arrive at a solution.

This makes the concept of mercy or grace still one of the most elusive areas in artificial intelligence technology.

Perhaps one of the most meaningful and insightful discussions between two characters about the understanding and implications of AI happen between the 'good' AI called The Vision, and the evil AI called 'Ultron' in the film Avengers: The Age of Ultron. They debate the possible survival of humankind, especially in light of the superior nature of artificial intelligence, and people's tendency to destroy the earth instead of looking after it.

Here is a part of the debate:

*The Vision: You're afraid.
Ultron: Of you?
The Vision: Of death. You're the last one.
Ultron: You were supposed to be the last. Stark asked for a saviour. He settled for a slave.
The Vision: I supposed we were both disappointments.
Ultron: You're supposed to be odd.
The Vision: Humans are odd. They think order and chaos are somehow opposites*

and try to control what won't be. But there is grace in their failings. I think you missed that.

Ultron: They're doomed!

The Vision: Yes, but a thing isn't beautiful because it lasts. It is a privilege to be among them.

Ultron: You're unbelievably naïve.

The Vision: Well, I was born yesterday.

As long as the need for the irrational and illogical concept of grace/mercy exists, it will be necessary for humankind to soften the deadly logic of artificial intelligence with the softness of the Gospel.

HOW CAN A THOROUGH UNDERSTANDING OF AI INFLUENCE THE CHRISTIAN CHURCH?

Like any technological development, it leads to a deeper understanding of ourselves, and exposes our own thoughts, desires and dreams.

On the one hand, the incredible advances in the areas of artificial intelligence points to humans' need for greater control over themselves, others and their environments. In addition, much of the critique against AI points to the technology's inability to move away from binary thinking and developing empathy, grace and forgiveness.

The Christian church therefore has a massive role to play here.

By leading believers on a journey of spiritual maturity and self-discovery, it may happen that we, as a global church, will forego our own need for control, that we will increasingly put our trust in God, and that we will be more emphatic and forgiving towards our fellow humans.

WHAT CAN LOCAL CONGREGATIONS DO IN THE FACE OF THESE TECHNOLOGICAL DEVELOPMENTS?

In an effort to empower companies so that they aren't overwhelmed by the increasing influence and effect of AI in the market, the Harvard Business Review published an article with the title 'Five Things Your AI Department Needs To Do'.²²

In light of the possible effect of AI technology, as well as all the philosophical and spiritual implications on the local church, we want to suggest that local congregations and ministers focus on their members' abilities to engage in meaningful interaction with technology and the media.



These interactions should, however, not lead to a one-sided spiritual approach, as we see more and more often on social media and elsewhere, but to a more emphatic and merciful understanding of other people, their pain and their circumstances.

Where the world tries to create organisations to provide more control over ourselves and others, let the Christian Church build organisations where we let go of that control by putting our faith in God and strengthening our bonds with each other.

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