



Australian Government

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**Launch of the Centre for Artificial Intelligence and Digital
Ethics**

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AI on my device, not in the cloud

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Let me start with a pop quiz.

Who said the following? "Computers make excellent and efficient servants, but I have no wish to serve under them".ⁱ

Was it Alan Turing, the father of computer science and artificial intelligence? No.

Surely then it was author Isaac Asimov who devised the Three Laws of Robotics designed to prevent robots harming humans? No.

It was none other than Mr Spock, the half-Vulcan, half-human Science Officer and second in command of the Starship 'Enterprise'.

You may recall that the Enterprise's mission of exploration and intergalactic diplomacy was ably supported by an assortment of high-tech gadgets.

Phasers, tractor beams, tricorders, and... an on board computer – capable of performing, within the confines of the ship, all the processing that was necessary to answer the Enterprise's queries.

The crew of the Enterprise weren't at all concerned with sharing personal and military secrets with the computer, and they certainly didn't get bombarded with endless advertisements.

That was the magic of the Enterprise computer: all of its processing was localised.

And herein lies the technological gulf between those on board the Enterprise, in the future, and us residing on this planet, in the present.

When I use my iPhone, and I use Siri a lot, I press the button and say "Siri, call my wife, Elizabeth Finkel". And Siri very happily replies "calling Elizabeth Finkel".

And it works really well... unless of course I am in an underground car park. In that case, Siri goes silent for 5 seconds, 10 seconds, before sheepishly saying "uh oh I'm having trouble connecting".

What this tells me is that the speech processing is not being performed on my iPhone. Instead, it takes place, on an unbelievably fast server, thousands of kilometres away.

My instruction goes by optical fibre to a server, a gigantic, powerful computer in the United States, in about 50 milliseconds. The server processes my words and sends them back to my phone as digital instructions rather than the original audio.

Nearly everything smart you do on your phone, is actually handled by servers; that means all the information about what you are doing is stored, deconstructed and analysed by servers devoid of any morals.

They are servers not servants, and, as such, they present an ethical dilemma.

I, of course, want the immense benefits that AI provides; but I am alarmed that, in order to do so my smart device relies on the AI in the cloud.

From the cloud, companies can identify me, follow me around, send me advertisements, and potentially share my information with third-party organisation.

In this new age of Artificial Intelligence, our key challenge is to harness the power of science to enhance human lives without sanctioning practices that violate human dignity.

It is my hope, therefore, that CAIDE, the Centre for Artificial Intelligence and Digital Ethics, in joint collaboration between the faculties, will have a two-pronged approach in guiding the development of AI and digital ethics: one short-term and one long-term.

In the short-term, with servers being the unavoidable foundation of today's AI, we must always remember this basic truth: no matter how fast the pace of AI innovation, it must never surpass the primacy of human rights.

For innovation divorced from values, a head without a heart, can only serve to harm humanity.

Totalitarian states offer a cautionary tale of what can happen when technology is turned into a tool for tyranny.

My belief that AI must serve the individual, and not the other way around, is rooted in my own story.

I stand here today as someone whose life was made possible by the promise of our ideals, and the protection of our laws.

My father came to these shores in search of that promise and protection.

He was born in Bialystok in north-eastern Poland and as a young man had been sent by his father to the southern part of the country to establish a rug-making business.

But the Second World War interrupted this venture.

Being Jewish, Dad's family suffered Nazi persecution that, for the first time in history, was facilitated by data and technology.

Punch-cards with census information, and tabulating machines able to sort 25,000 cards per hour, were re-purposed by the Nazis to target individuals deemed undesirable by the regime.ⁱⁱ

Many of Dad's relatives were systematically identified and executed for the crime of being alive.

Of course, the Nazis had the pretence of justice. They had courts. They had a constitution. But these were designed to serve as a cynical veneer for murder and oppression.

The rule of law twisted and degraded into a perversion of law.

Dad spent most of the war in Siberia, before he and his brother made it here on the first ship to bring out Jewish Holocaust survivors.

When he arrived in Australia, he found that the strength of the state rested on the strength of our democracy.

He found citizens free from fear, who held their leaders accountable through open and honest elections.

He found the same technologies that had wrought such terrible crimes in Europe used here for the collective good.

And an independent judiciary dedicated to defending the liberty and equality of all.

And that promise has only grown over time.

We must always remember that the same enlightened society that advanced the cause of science has also advanced the cause of justice.

The same persistence that opened up new frontiers of discovery, also opened new doors of equal opportunity.

As the holders of this legacy, we bear great responsibility to ensure these sacred ideals continue to be afforded to everyone.

Indeed, this spirit of achievement and special responsibility has defined the University of Melbourne, in particular, ever since its foundation stone was laid in 1853.

It is that spirit that has made this institution a central part of Australia's intellectual heritage and a central part of our larger national story.

This institution has been the home of many firsts: the first university established in Victoria. The first woman to graduate from an Australian university.

But key to its mission has been to ensure those firsts led to more breakthroughs. Progress has been this institution's hallmark.

Generations of dreamers and innovators have come to these halls determined to strive for more. Armed with a willingness to question conventional wisdom and change the way we see the world.

None more so than Professor Graeme Clark, inventor of the Bionic Ear.

As Professor Clark once noted: "All the scientists around the world said it wasn't possible".ⁱⁱⁱ But it was possible.

And now, emerging researchers it's your turn.

You have doors open to you never before afforded to any people in any age. You can help foster a society where our enduring ideals, and our technological aspirations, are both furthered and strengthened.

By design, CAIDE will not be a silo: it will work on incorporating AI into *all* fields of study, thereby becoming a connective tissue across the University.

By conducting interdisciplinary research and teaching, supporting emerging researchers, and collaborating with national and international industry and university partners, CAIDE can foster a cross-pollination of ideas that will lead to advances of unlimited potential.

And this, I believe, is exactly what will be required in the future to ensure we can pursue the tremendous possibilities of A.I while still fulfilling our moral duties.

In the long-term, I believe that the way forward for AI is *more* technology.

I want us to 'boldly go where no one has gone before' and make the computer on our phones so powerful that there is simply no need to risk our privacy or security.

I want the power of the Star Trek computer on my phone, with all the processing nous and capability to take my complex questions, interpret them without ever seeking advice from a server, and then anonymously reach out to the cloud to get the answers to what I need.

AI on my device, not in the cloud.

And please don't tell me this ambition is 'highly illogical'.

In fact, I *know* we have the capacity to 'make it so'.

In November last year I attended a government summit called Tectonic, hosted by the Minister for Industry, Science and Technology, Karen Andrews.

Tectonic explored opportunities to maximise the benefits of AI for Australia.

It was there I first learned about Home Guardian, an Australian company with a very simple system that has the potential to revolutionise the aged care, disability and hospital sectors.

Using a world-first artificial intelligence device, Home Guardian uses sensors to monitor movement. Its single-minded job is to alert carers or family members if an unexplained fall occurs.

The AI inside Home Guardian is trained in advance. Without even being connected to the internet, it knows how to identify objects in a room, what normal behaviour and interaction is, and most importantly, what isn't normal.

Once abnormal interaction or behaviour is detected, it alerts a loved one, carer or nurse via text message – all without compromising the user's privacy.

Because no images are sent outside the user's home, and no internet is required, Home Guardian is able to do its job without ever needing to consult an external server. Without ever needing to risk your privacy.

Imagine for a moment downloading an app for your smartphone or digital home assistant designed for a similar purpose. An app that, unbeknownst to you, has been compromised, allowing cybercriminals to spy on you and determine when your home is empty.

I'm afraid such a frightening prospect is coming closer to reality.

Last year, German researchers were able to create four apps for Amazon Alexa and four for Google Home, all of which passed the security vetting processes of both companies.^{iv}

On the surface, these apps were simple horoscope applications. In reality, they were "smart spies" that had the capacity to allow the researchers to spy on users and phish for their passwords.

At a time when Artificial Intelligence has some relevance to all, this revelation is disquieting for all.

For AI's future to be assured, it must be seen by the public as an effective and safe instrument for individual empowerment, and not as an instrument vulnerable to exploitation.

I want my future AI phone being *my* servant, not somebody else's.

As such, last year the Australian Government released a set of 'AI Ethics Principles' to build public trust, as well as help guide businesses and government to responsibly develop and use AI systems.

But these principles require that we take the actions that will give them meaning and purpose.

Our rights, our freedoms, are not a given. They must be jealously protected and constantly renewed to meet the challenges of our time.

The work you will do here, therefore, will have a profound influence on our homes, our communities and, ultimately, on our nation.

It will have a ripple effect on our daily lives, the lives of our children, and the kind of Australia they will inherit tomorrow.

I congratulate everyone who has worked tirelessly to make this wonderful vision a reality.

May CAIDE strengthen our nation's sense of purpose and ambition.

May it... live long and prosper.

Thank you.

ⁱ Star Trek (1966–1969). The Ultimate Computer. Season 2. Episode 24.

ⁱⁱ <http://www.writing.upenn.edu/~afilreis/Holocaust/black.html>

ⁱⁱⁱ Pioneering Miracles: Professor Graeme Clark and Dr. Anders Tjellström. https://youtu.be/zbVfK-c_7U4

^{iv} <https://srlabs.de/bites/smart-spies/>