A-01*

AI Researchers Call for Action on Autonomous Weapons
Open letter supporting the 'Act Now on Killer Robots' petition

We are members of New Zealand's academic community of AI researchers. We are writing to support the 'Act Now on Killer Robots' petition to parliament which calls on New Zealand to take a firm stand against weaponising AI and take action at the national and international levels.

We applaud the work New Zealand has done so far to develop a national policy on autonomous weapon systems, and we look forward to seeing a national policy that clearly defines a category of autonomous weapons (AWs) that are banned by New Zealand. We also urge New Zealand to engage actively in the development of an international framework to effectively prohibit and regulate AWs.

New Zealand is a developer of AI technologies, through work happening in the New Zealand tech industry, and also through our academic research, which we normally place in the public domain as is customary in academia. AI technologies often have very general applications: for instance, machine learning, computer vision, and robot technologies can all be deployed in many different domains. Our public domain AI research can be used for many socially useful purposes - but it could also readily be incorporated into AWs, developed anywhere in the world - an outcome that would be abhorrent to us personally, and we believe to the wider New Zealand public too. The only thing that can effectively prevent this from happening is effective international, as well as national, regulation to ban AWs. AI technologies are so general that the only way to control them is by regulating their use.

Autonomous weapon systems threaten to become the third revolution in warfare. If developed, they will permit armed conflict to be fought at a scale greater than ever, and at timescales faster than humans can comprehend. The deadly consequence of this is that machines - not people - will determine who lives and dies. Without regulation, another global arms race will be precipitated, compounding and intensifying existing arms races, at a time when the world must focus on reducing international tensions, and promoting international cooperation, to address critical global emergencies, in climate change and pandemic response. Furthermore, autonomous weapon systems would also end up in the hands of non-state actors such as terrorist organisations and even individuals. As New Zealand-based AI researchers, we urge the New Zealand government to do its utmost to ban the development or use of AWs, to prevent an escalation of deadly technologies.

An autonomous weapon system is one which is not under 'meaningful human control'. There is a commonly articulated distinction between a fully autonomous weapon system, that 'once activated, can select and engage targets without further intervention by a human operator' (US Department of Defense Directive 3000.09), and a weapon system with a human controller 'on the loop', whose operator can monitor and halt an otherwise autonomous weapon's target engagement.[1] There have been suggestions that meaningful

human control could be ensured through a human 'on the loop' applied through programming constraints governing target selection and engagement, and an ability to disengage the system if required.

Many of us have experience of how humans can control automated systems; these researchers wish to voice scepticism about the argument that a human 'on the loop' is sufficient to ensure meaningful human control. Often, the speed of engagement may well prevent meaningful human control from being achieved by providing a “disengage” button to a human. But it is not just a matter of speed. Human factors research in psychology clearly shows that humans struggle to adequately monitor systems that operate autonomously for any length of time.[2] This is what makes it hard for people to operate a car that 'mostly drives itself', but occasionally requires intervention by a human driver to avoid a crash. AI research also shows that humans can learn to trust an AI system over time, to the extent that they do not question the recommendations or decisions being made and simply assume that the computer is correct.

We are also concerned about the possibility for errors in the operation of AWs - especially errors that arise through the compilation of unrepresentative training sets, leading to various forms of bias. These problems have been thoroughly documented by AI researchers, and no current AI technologies are immune to them. But even if AI systems improve to a point when they perform better than humans on the relevant measures - still a good way off, in our estimation - we still do not want to turn over decisions about life and death to machines, and we still don't want to see another arms race which is still at present entirely avoidable.

Autonomous weapon systems that remove meaningful human control from determining the legitimacy of targets and deploying lethal force sit on the wrong side of a clear moral line, and will make the world less secure. New Zealand has a long and proud history of moral leadership in this area, as seen for instance in its strong position against nuclear weapons, and its role in the Convention on Cluster Munitions. We hope that the current New Zealand government can continue to build on this proud legacy.

Signed (as at 17 November 2021):

Assocociate Professor Alistair Knott, Associate Professor of Conputer Science, University of Otago

Dr Andrew Chen, Research Fellow, Koi Tū: The Centre for Informed Futures, The University of Auckland

Professor Michael Winikoff , Professor and Head of School, Te Herenga Waka-Victoria University of Wellington

Dr Fabio Morreale, Lecturer, University of Auckland

Professor Stephen Cranefield, University of Otago

Dr Rodelyn Jaksons, Data Scientist, Plant and Food Research

Dr Thomas Gregory, Senior Lecturer in Politics and International Relations, University of Auckland

Mr Pradeesh, Student, University of Otago

Dr Veronica Liesaputra, Lecturer, The University of Otago

Mr Jithin, PhD Scholar, University of Otago

Professor Brendan McCane, Professor and HoD, University of Otago

Dr Brendon Woodford, Senior Lecturer, University of Otago

Mr Ali Abdul Hussain, PhD Student, Massey University

Dr Geeta Duppati, Senior Lecturer in Finance, Waikato Management School, University of Waikato

Dr Harith Al-Sahaf, Lecturer, Victoria University of Wllington

Dr James Atlas, Senior Lecturer, University of Canterbury

Dr Nick Lim Jin Sean, Post Doctoral Researcher, University of Waikato

Nuwan Gunasekara, PhD Student, University of Waikato

Dr Feng Hou, Postdoc, Massey University

Dr Nirmal Nair, Associate Professor, University of Auckland

Mr Wayne Rumbles, Associate Professor, Te Piringa - Faculty of Law, University of Waikato

Dr Haibo Zhang, Senior Lecturer, University of Otago

Mr Jinge Li, Data Scientist, Interpine

Dr Karaitiana Taiuru

Professor Anthony Robins, Professor of Computer Science, University of Otago

Dr Steven Mills, Associate Professor, University of Otago

Associate Professor Michael Cree, University of Waikato

Miss Katrina Bennett, R&D Engineer, Soul Machines

Gray Manicom, PhD student, The University of Auckland

Mr Kiarie Ndegwa, Data Scientist, Dragonfly Datascience

Dr Peter Whigham, Associate Professor, University of Otago

Dr Neset Tan, PhD Student, The University of Auckland

Dr Andrew Lensen, Lecturer in Artificial Intelligence, Te Herenga Waka-Victoria University of Wellington

Mr Jordan MacLachlan, Doctoral Candidate, Victoria University of Wellington

Dr Ruwang Jiao, Postdoc, Victoria Unversity of Wellington

Mr Kaan Demir, PhD Student, Victoria University of Wellington

Dr Mark Sagar, CEO, Soul Machines

Dr Khurram Jawed, Director of Research, Soul Machines

Mr Zackary Molloy, Student, University of Otago

Professor James Maclaurin, Co-Director, Centre for AI and Public Policy (CAIPP), University of Otago

Caitlin Owen, University of Otago

Mr David Knox, Data Scientist, Lynker Analytics

Abira Sengupta, PhD, Otago University

Dr David Eyers, Associate Professor, University of Otago

Dr Michael Mayo, University of Waikato

Daniel Guppy, PhD Candidate, Otago University

Professor Eibe Frank, Professor University of Waikato

Mr Hayden Andersen, PhD Student, Victoria University of Wellington

Mr Jian Liu, Data scientist, Plant and food research

Mr Davis Cooper, PhD Student, Victoria University of Wellington

Professor Geoff Wyvill, Emeritus Professor, University of Otago

Associate Professor Peter M Andreae, Deputy Head of the School of Engineering and Computer Science, Victoria University of Wellington

Professor Neil Dodgson, Dean of Graduate Research, Victoria University of Wellington

Alvaro Menendez, PhD candidate, University of Auckland

Dr Tony C Smith, Senior Lecturer, University of Waikato

Dana Contreras, PhD student, University of auckland

Mr Baligh Al-Helali, Postdoc, Victoria University of Wellington

Mr Damien O'Neill, Doctoral Candidate, Victoria University of Technology

Professor Bing Xue, Victoria university of Wellington

Mrs Amritha Menon Anavankot, Doctoral Candidate, University of Otago

Mr Daniel Thomas Braithwaite, PhD Candidate, Victoria University of Wellington

Ms Briony Blackmore, PhD Student, University of Otago

Mr Harisu Abdullahi Shehu, PhD Researcher, Victoria University of Wellington

Professor Lisa Ellis, Steering Committee Member, Centre for AI and Public Policy, University of Otago

Dr Stefanie Zollmann, Senior Lecturer, University of Otago

Dr Andrew Vonasch, Senior Lecturer, Psychology, University of Canterbury

Dr Fei Dai PhD, Otago University

Professor Hans W Guesgen, Chair in Computer Science, Massey University

Dr Janet Toland, Associate Professor, Victoria University of Wellington

Dr Tobias Langlotz, Associate Professor, University of Otago

Dr Nathan Pages, R&D software engineer, SoulMachines

Dr Oliver Sinnen, Associate Professor, University of Auckland

Dr Zhiyi Huang, Associate Professor, University of Otago

Professor Holger Regenbrecht, Head of Department, University of Otago, Information Science

Pascal Omondiagbe, Research Software Engineer, Landcare Research/ Otago University

Dr Kuda Dube, Lecturer, Massey University

Mr Amr, PhD candidate, Victoria University of Wellington

Professor Rhema Vaithianathan, Professor AUT

Dr Daniel Wilson, Professional Teaching Fellow, Waipapa Taumata Rau / University of Auckland

Dr Damien William Mather, Senior Lecturer, University of Otago

Professor Tim Dare, Professor of Philosophy, University of Auckland

Dr John Williams, Senior Lecturer, University of Otago

Dr Danielle Lottridge, Senior Lecturer, School of Computer Science, University of Auckland

Dr Suzanne Woodward, Researcher, Public Policy Institute

Dr Thomas Lacombe, Professional Teaching Fellow, University of Auckland

Hemi Edwards, Research Assistant, University of Auckland

Dr Juergen Gnoth, Professor, Otago University

Dr Lech Szymanski, Lecturer, University of Otago

Dr Ethan Plaut, Lecturer, Waipapa Taumata Rau | University of Auckland

Dr Jonathan Conder, R&D Software Engineer, Soul Machines

Professor Nikola Kasabov, Professor, AUT

Sara Cole Stratton, Founder, Māori Lab

Dr Val O'Reilly, Executive Director, The Career Development Company

Dr Linley Jesson, Group Leader Data Science, Plant and Food Research

Ms Hanna Van der Giessen, Clinical Research Scientist, HeartLab Limited

Dr Greg Bodeker, Director, Bodeker Scientific

Dr Martin Takac, Senior R&D, Soul Machines Ltd.

Associate Professor Grant Dick, University of Otago

Professor Albert Bifet, University of Waikato

---

[1] 'Defense Primer: US Policy on Lethal Autonomous Weapon Systems', US Congressional Research Service, Dec. 2020

[2] See e.g. Zerilli et al., *Algorithmic Decision-Making and the Control Problem, Minds and Machines* (2019) 29:555–578

*** Document A-01**, in Appendix: 'Act Now on Killer Robots' Petition Submission Supporting Open Letters and Submissions, stopkillerrobots.org.nz @KillerRobotsNZ