National Hui Report

Centre of Machine Learning for Social Good





CENTRE OF MACHINE LEARNING FOR SOCIAL GOOD

Event on 23 August 2024

National Hui **Background**

The Centre of Machine Learning for Social Good (ML4SG) is a research centre established at the University of Auckland. ML4SG's mission is to advance fundamental knowledge in machine learning and data analytics while addressing the most challenging and pressing health, environmental, and societal problems of our time. This is the first centre in Aotearoa focusing on using machine learning to solve high-impact societal issues, working collaboratively with domain experts. Since the centre's establishment a year ago, significant progress has been made on a keystone project and other ongoing projects advancing the centre's cause. Currently, the centre is undergoing iterative improvements to strengthen its approach on projects and expand its reach.

In line with the centre's mission, a National Hui was established to promote the collaboration essential for advancing our goals. Various groups from different backgrounds were invited to the Hui on the afternoon of August 23rd 2024 from 12:00 – 3:00, hosted at the University of Auckland. This event provided the opportunity to showcase the centre's activities to communities and encourage their involvement. This year's Hui began with two keynote speakers who highlighted the potential of ML and AI in social good sectors. This was followed by an open discussion on the centre's white paper and concluded with a showcase of the centre's flagship project and other initiatives.

Purpose

- To showcase the centre through its current progress and work
- To strengthen relationships and build a community centred around utilising ML and AI for social good
- To further establish the centre's values and principles through collaborative feedback and discussions
- To consolidate the centre's approach in future social good projects





National Hui General Outcomes

The Hui brought together around 30 people from industry, research spaces, local council, government, and community. Attendees specialised in various domains including environmental, health, social science, and technology, fostering a rich exchange of discussions. The introduction of the centre's draft white paper generated good quality conversation regarding the principles and values underpinning the centre. Keynote speakers provided insight on the potential of machine learning and AI for social good projects in environment and health, and the centre's flagship project was showcased. Open engagement was encouraged and emphasised to solidify the centre's identity as community-built and founded upon shared goals and passion.

Discussions

Machine Learning and AI Applications

In order to connect to an audience with various backgrounds, the National Hui presented various speakers that gave valuable insights in using machine learning and AI in different fields. This emphasised the transdisciplinary approach that the centre embraces, demonstrating its commitment to integrating diverse perspectives and expertise to address complex social challenges.



Environment – DNA Biodiversity Drive

Motivation

- Crucial to understand Aotearoa specific insect and fungal ecology
- Huge changes in ecology overtime that can ultimately impact local biodiversity
- Community ecology is massively contingent and is difficult to predict using apriori laws

Solution

- Citizen science approach that asked community groups to take bug and biodiversity samples from car number plates
- With this sample, alongside the routes taken by their cars, researchers can effectively track and identify the biodiversity in different areas in Aotearoa
- Please contact *richard.o'rorke@auckland.ac.nz* for a sample collection package and be a part of the project!

Healthcare - The Healthcare System

Motivation

- The healthcare system's failure to address inequities effectively results in the persistence of avoidable health complications and deaths
- Ineffective approach in specialised care and proper health information distribution
- Massive amount of unstructured routinely collected (administrative) data that may contain important clinical details
- Significant disconnect in health systems wherein crucial health information are being held out causing intermittent data delivery and slow diagnoses

Machine Learning Applications

- Resource planning
 - Analyse rich unstructured administrative data to effectively allocate resources to relevant subgroups
- Quality improvement
 - Reduce inequities in medical implementations and interventions by timely and clinically-appropriate monitoring
 - Minimise interventions in cases involving uncertain combinations of medical treatments
- Clinical trial causation
 - Use machine learning models in improving analyses and equitability of clinical trials, that would otherwise be expensive and intractable





National Hui ML4SG Progress Showcase

Within a year since the first National Hui, ML4SG has made significant strides in defining its identity as a centre through its flagship project and white paper. As a community-driven initiative, the centre is dedicated to delivering tangible benefits for social good and the local community. This year's National Hui engaged participants in shaping the centre's approach to social good projects, community building, and its core principles by inviting their active participation and feedback.

White Paper – A Roadmap for Machine Learning for Social Good in Aotearoa

Centre's Motivation

- Machine learning can be utilised as a tool to deliver positive social impact in areas such as environment, healthcare, social welfare, and more.
- Solutions must be grounded within the local Aotearoa context and underline the centre's bicultural foundations
 - Huge focus on underrepresented groups
 - Local and global impact might have varying solutions

Centre's Process to Social Good Projects

- Must align with the community values that underpin the centre's principles
 Maori and indigenous values
- Must work well with the community it provides a solution to
 - Expectations, responsibilities, and project endpoints must be clearly agreed on
 - Need to consider its values to different sub-community groups
 - Available resource, scalability, and feasibility are important factors in approaching a solution
 - Must be intuitive and accessible for the groups involved
- Respect a transdisciplinary approach to designing a solution
 - Need all parties involved to co engage and collaborate
 - Requires well defined partnerships centred around clear communication and obligations



Open Discussion

- Need to reconsider how the centre is defining social good. Need to redefine the utilitarian context in the white paper. Perhaps restructuring its scope to give more importance to communities that need it the most.
- Must consider how to closely approach relationships. Resource allocation and funding are crucial in the research process, making it essential to actively seek partnerships and collaborations that can make these resources more accessible.
- It is important to communicate the centre's approach in a way that is clear, accessible, and intuitive for the broader community. Since machine learning and AI are often misconstrued, it's essential to carefully convey what it is capable of.

Flagship Project - Stoat ReID



- ML4SG partnered with Te Korowai o Waiheke to track down elusive stoat breeding pairs in Waiheke Island. The centre presented the solution of a vision machine learning model that can recognise specific stoats.
- Limitations in technological resources and data were recognised during the project. The centre received photos that were unclean and needed to be filtered through. Furthermore, the centre needed to avoid creating a model that is computationally expensive.
- The solution needed to be both accessible and cost-effective for the organisation. Although the main model is already performing well, the centre is now focused on developing an intuitive interface that simplifies the model's complexities, making it easier for users to interact with.
- The centre and Te Korowai o Waiheke worked on creating a close partnership, adopting a transdisciplinary approach that consolidated knowledge between both the centre's and the organisation's specialists.







Call for Feedback

We value your insights and invite you to share your thoughts on the Centre's mission, the draft white paper, and our flagship project. Your feedback will help us better align with community needs and improve our work. Please send your comments to *ml.socialgood@gmail.com* Thank you for your valuable feedback!



NATIONAL HUI REPORT / PAGE 7



A National Hui Report from the Centre of Machine learning for Social Good

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