INDIGIDATA AOTEAROA

Kirikiriroa (Hamilton)
Aotearoa New Zealand
21 - 24 August 2023

Post-Event Summary Report

Introduction

Tēnā koutou, tēnā koutou, tēnā koutou katoa.

From the 21st to the 24th of August, the inaugural Indigidata Aotearoa 2023 was held at Te Whare Wānanga o Waikato. In recent years there has been significant advances in the fields of Indigenous data science and sovereignty. The Indigidata Aotearoa programme was designed to develop an understanding of Indigenous data science and sovereignty alongside some of the best researchers in Aotearoa New Zealand. The fully funded wānanga was open to Māori (tauira, kaitiaki, kaipakihi) participants from across Aotearoa. Applications were received from more than 35 respondents, and 23 tauira Māori attended the inaugural event.

All research conducted in Aotearoa New Zealand should involve consultation with Māori. Thus it is important that Māori understand enough about the technical, ethical and cultural issues to engage in robust discussions and make decisions from within a korowai of mana Motuhake. The team at Te Kotahi Research Institute hosted 23 tauira from around Aotearoa; and from a diverse range of backgrounds including - post and undergraduate, Iwi Māori organisations, corporate and community.

During the wānanga tauira were fortunate to wānanga with some of the best researchers in Aotearoa New Zealand, such as:

Dr Kali Dale
Associate Professor Maui Hudson
Associate Professor Te Taka Keegan
Dr Warren Williams
Professor Tahu Kukutai
Dr Alvin Yeo
Professor Annika Hinze
Dr Kali Dale
Dinindu Senanayake
Dr Tyler McInnes
Dr Nisha Ghatak
Nick Jones
Dr Nic Vanderschantz
Vanessa Clark
Kevin Shedlock
Zane Rawson
Manaaki Vercoe
Dr Nick Lim
Dr Paul Brown
Professor Albert Bifet
Dr Kepa Morgan
Aaron Murrihy
Tasman Gillies
Matt Bixley

Te Kotahi Research Institute and Indigidata Aotearoa 2023 tauira express our gratitude for the opportunity provided and the time shared by all of these Tangata Rongonui. A very special thank you is conveyed to our esteemed international Keynote Speaker – Dr Kali Dale. Dr Dale is from Bemidji, Minnesota USA, and a citizen of the White Earth Nation of Ojibwe Indians. She earned her doctorate in Oncological Sciences from the University of Utah in 2022 and is an expert in Indigenous Data Science and Indigenous Data Sovereignty.

Sponsors

Funding to hold the wānanga was generously received from several contributors. Te Kotahi Research Institute acknowledge support from the following institutions NESI, REANNZ, Genomics Aotearoa, TAIAO, and Tikanga in Technology.

Programme

Day 0 - Rātapu, 20 o Hereturikōkā (Sunday, 20th of August)

Arrive in Kirikiriroa

5pm – 5.45pm	**Check into accommodation** (Podium Lodge, Cambridge)
6pm - 8pm	**Welcome/reception dinner at accommodation** Reception dinner - Welcome - Housekeeping - Whakawhanaungatanga - Pre-workshop assessment - Prepare for Day 1

Indigidata Aotearoa tauira were welcomed to Hamilton Kirikiriroa on Sunday 20th August 2023 where a reception dinner and whakawhanaungatanga was held. The main focus of the evening session was introductions to each other and ngā kaupapa o te wānanga. Assoc. Prof Maui Hudson provided an overview of Indigidata Aotearoa, and officially introduced Dr Kali Dale. Tauira were excited to learn that the wānanga would officially commence with a field trip to Tūrangawaewae Marae in Ngāruawahia, to attend the official Karakia o te Kīngi Māori at the annual Koroneihana.


Tauira responses to Day 0 were captured as follows:

Patai: What are you hoping to get out of Indigidata Aotearoa?

- Learning more about Māori Data Governance and best practices for Māori data
- E rapu tauira ana matou mo tetahi hotaka mo ngaa iwi erua a Ngapuhi raua ko Ngati Hine.
- Networks and pathways that our children can participate in
- I'm hoping that I can have more understanding of Māori data and our obligations to care for it. It would be good to gain more information, support and networks. It's also priviledged being hosted by our Tainui & Whakatōhea whanaunga
- Get to know more about protecting indigenous data
- I just want to learn more about how data sovereignty is manifesting in areas outside of bioinformatics
- Knowledge, skills, networks
- Knowledge
- I am hoping to firstly understand more about data science and how it relates to indigenous. I am also hoping to meet new people and gain connections
- A better understanding of what Indigenous data is, how we can be better kaitiaki of that data and how we can ensure it exists for future generations.
- Improve my understanding and practical skills relating to data sovereignty and data science, and network and learn from others with relevant experience and skills
- A plan to protect taonga with cultural licensing. Te Ao Māori principles and values to emanate right through this kaupapa. upskill, gain useable tools to take home. Support local initiatives. Build capacity, network and seek who wants to be on our team to advocate for the Nagoya protocols
- New connections and better understanding.
- I'm hoping to come away from this wananga with a well rounded understanding of indigenous data science and its applications to Māori data. Additionally, I hope to make more connections within this space and feel a sense of community as I continue my journey in Māori research.
- Understanding on the process, for this kaupapa listen to other views.

- Learning, networking, discussion
- Gain knowledge and resources to better develop my position and understanding of Māori Data Sovereignty.
- 1) To better understand coding language 2) Explore the current handling of Māori data and strategising ways to enhance frameworks/infrastructure, ensuring Māori governance and operation, and how to navigate those conversations.
- I want to learn and understand more about indigenous data sovereignty, particularly Māori data sovereignty.
- Principals relating to Indigenous data that can be translated & integrated into the mainstream corporate realm that ensures it retains its authenticity and is not compromised. Validates indigenous data principals for our iwi and whanau.

Day 1 - Rāhina, 21 o Hereturikōkā (Monday, 21st of August)

9am - 9.45am **11am - 11.30am**	**Travel to Tūrangawaewae Marae - Koroneihana - Te Rā o Kīngi Tuheitia - Karakia at 10am** **Return to UoW Te Kohinga Marama Marae, UoW**
11.30am	**Whakatau - Introduction to Indigidata**
12pm - 1pm	**LUNCH**
1pm - 1.45pm	**Introduction to Indigenous Data Science -** *Assoc Prof Te Taka Keegan*
1.45pm - 2.30pm	**Introduction to Indigenous Data Sovereignty** - *Dr Warren Williams*
2.30pm - 2.45pm	**BREAK**
2.45pm - 3.30pm	**Iwi Data: Whakatōhea / University of Waikato (Coding at schools)** - *Dr Alvin Yeo & Prof Annika Hinze*
3.30pm - 4pm	**Te Kāhui Raraunga - Māori Data Governance Model** - *Prof Tahu Kukutai*
4pm - 4.15pm	**BREAK**
4.15pm - 5pm	**Māori Data: Ngā Tikanga Paihere / Local Contexts** - *Assoc Prof Maui Hudson*
5pm - 5.15pm	**Participant evaluations of the day**
5.15pm - 7pm	**Kai Hākari at Te Kohinga Marama Marae** **International Guest Speaker -** *Dr Kali Dale*

Kiingitanga hold Koroneihana (coronation anniversary celebration) each year.
It is a calling together of all Māori to discuss important issues, as well as the bringing together of a continuous and highly regarded genealogy. It is an open invitation to visitors from Aotearoa and throughout the world, to join and to celebrate the unique and important customs and traditions of Kiingitanga, and of Māori.

A reference to *Indigenous Data Sovereignty* can be read in the following excerpt taken from Te Arikinui Dame Te Atairangikaahu speech she made at the 35th Koroneihana celebrations in

2001.

> *"Kīngitanga stands for the love we bear for one another. It tells when we are right and what is right.*
> *It stands for Mana Motuhake, the importance of our faith in ourselves under God.*
> *It draws us back, always to have respect for orderly conduct according to both Māori custom, the lore, and law of the land which came with the Treaty that was signed by two people during the reign of Queen Victoria."*

Tauira and the team from TKRI felt incredibly honoured to be able to take part in the Koroneihana celebrations. We were treated to an "almost" front seat position on the marae ātea directly behind the bust of our treasured tupuna Te Puea Herangi, and an unofficial meet and greet with the CEO of Waikato Tainui – Donna Flavell.

Tauira responses to Day 1 were captured as follows:

What did you learn during today's sessions that you anticipate using in the future?

- The Kōrero around making frameworks that are thorough yet applicable
- As a PhD graduate in the subject I am very satisfied with both the content and quality of the subject matter. 3 of us are from Te Tai Tokerau and we take back home valuable lesson in which to teach our two iwi. Very satisfied with the highly quality presenters. Ngaa mihi ki a koutou
- There was so much - is it possible to receive the powerpoints of each kaikorero please?
- lots about who benefits the data and how to ensure that its looked after under tikanga
- Te reo Māori as the default for building
- I learned more about data sovereignty and the firstly the difference types whether it be our actions or food or values. I will use this to make better informed decisions that may result around this area.
- Status of indigidata as a movement
- More about what is happening around the motu and data governance
- Te Kāhui Raraunga model and report for data governance will be especially helpful
- Public services Statutory Treaty obligations
- I have a broad understanding of data science now
- Everything 💜
- Māori data governance model within contexts of using statistical data
- Māori data governance model mahi
- Information about data systems
- Better knowledge around data science and what's involved
- I found the data governance model useful and want to apply data sovereignty principles into my own work
- The discussions that have been generated during the day have been great to add both information and thought provoking ideas. I have learnt not only from the speakers we've had but also from my fellow participants. It's been a great day.
- How values are described, I.e., English vs Te Reo Māori.
- Lots and lots of stuff, very overwhelming
- Recommend approaches for text and voice recognition for Indigenous data.

Was there anything you did not understand during todays sessions?

- Kao, pai ngā kaupapa katoa
- Personally more time I reckon to explain and understand more. I also think the areas were quite relayed but different so perhaps more in depth into what section of sovereignty each discussion was
- Understood entire day
- Regulation vs legislation I'd like to have elaborated on more, what they are and what the difference is
- I learnt heaps but still big gaps on what I want

- This bot skipped the last question lol can't see what I'm typing either. Development in AI Is prevalent and I'm seeing it benefit people but also can cause a lot of harm to Māori artist, business owners, community and Iwi and hapu
- Still processing the information from all of the sessions, but everything makes sense so far!
- Understood most of it!
- No was all very good very open minded

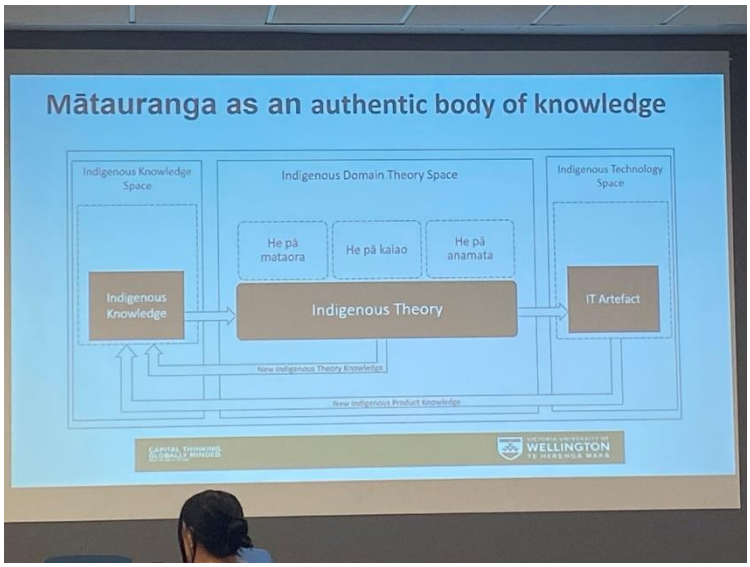
What is the most valuable thing you learned today?

- We shouldn't keep throwing the tangas at our pākehā collaborators
- classification of data/knowledge
- Still threading it all together; I enjoyed it all, but I would be keenly interested in further discussion as to how we might implement or standardise a Māori data governance framework for government agencies.
- making small steps in this area is important too.
- Relationships and language. Starting from indigenous language and perspective and translating to English
- Personally I think everything was important and interconnected. I believe all the information we talked about today shows everyone's different views that could lead to new exciting outlooks and ideas
- Knowledge update of indigenous data movement
- Meeting new people
- What questions to ask (or think about) - whose data, whose control, whose values, and who benefits
- The political landscape from Professor Kukutai
- Learnt more about data sovereignty and what it entails
- The interest our rangatahi have in learning/understanding
- The overlap and connections made between applications of indigenous data sovereignty and western ideas in data
- How smart some of our people are
- Data Governance model/Data Sovereignty
- All of it!
- To be better for the future generations.
- The issues surrounding AI, specifically ChatGPT and using te reo māori. Also the history of "aa" vs "ā".
- Just all the korero from the different speakers
- Knowledge with current exposure of Māori data

Day 2 – Rātū, 22 o Hereturikōkā (Tuesday, 22nd of August)

9am - 10.30am	**Coding session –** *Dinindu Senanayake / Dr Tyler McInnes* Introduction to Bash The command line is a powerful way to interact with your computer's operating system. In this coding session you will learn to navigate the file system and organise (copy, move, rename and delete) files, and even find hidden files on your system! You will then learn how these tools can be combined together to automate tasks.
10.30am - 11am	**Indigidata in the US -** *Dr Kali Dale*
11am - 11.15am	**BREAK**
11.15am - 12.15pm	**Takiwā -** *Tasman Gillies* Data visualisation on Takiwā to help support the work of the East Coast Exchange and Toha, especially post-Cyclone Gabrielle.
12.15pm - 1pm	**LUNCH**
1pm - 2pm	**Ngāti Tīpa / Māori Privacy Framework -** *Vanessa Clark*
2pm - 3pm	**Veracity project - Māori perspectives on Trust** - *Kevin Shedlock & Zane Rawson*
3pm - 3.30pm	**Introduction to E-sports -** *Manaaki Vercoe*
3.30pm - 4pm	**BREAK**
4pm - 5.30pm	**E-Sports and Activity** - *Manaaki Vercoe & Natalie Kusabs*
5.30pm - 5.45pm	**Participant evaluations of the day**
6.15pm	**Dinner - Pizza night at The Podium / visit whānau**

This was an interactive day with lots of movement between computer lab, lecture rooms, e-sports hub, and a visit to the newly opened Te Paa. Tauira were treated with maatauranga from coders, international indigenous expertise from Dr Kali Dale, hapū and iwi personalised data maatauranga experience, and the exciting and interesting world of e-sports.



Tauira responses to Day 2 were captured as follows:

What did you enjoy most about today?

- I quite liked the introduction to bash coding
- E sports, brother has a plan and is killing it
- I enjoyed the Programming aspect because I enjoy programming and everyone did well and it showed everyone coding isn't impossible and everyone can do it
- The Māori carvings all around University
- New learnings
- Coding, veracity project and e-sports
- Every kaikorero was inspirational - I love the indigenous data space. Ethical innovation and technology.
- Ngati Tiipa korero
- Learning something new all over again! So great!

- The ethics stuff with Maui
- The coding session because I had never used Bash before and think it could be very relevant to my mahi and the introduction and referral for future opportunities will be really helpful
- I really liked the morning sessions, thought they were really valuable
- Whanaungatanga. The first session was great easy-to-relate to
- The E-sports activity and tour of the pā
- The tour we had with Nat was great 😁 was nice to hear some history behind the pā and the uni. Also didn't mind the coding session thanks to the help post-its!
- The bash session and Maui's talk defining these key concepts for this Indigidata space. Also Kalis talk about Indigidata in the US

What did you learn during today's sessions that you anticipate using in the future?

- Bash, as it's used a lot in Linux and is generally useful for programmers
- I have a lot more respect for the work that has been done this far in regards to data sovereignty
- I'm going to try learn more of this programming language at home cause found it interesting
- Still digesting
- Framework korero
- Veracity project, overseas work with Dr Kali Dale and e-sprots
- Unlike physical data/media, digital data/media could last an eternity, nuance on parameters, style, language and aesthetics are likely to change over time (decades, centuries), therefore, a qualitative narrative should be recorded as a protocol on version controls. Consider this now to ensure the context when versions are changed are captured through the generations.
- all components to support our non-profit AI system
- um few things - around importance on what year you wish to start your research
- Vanessa's korero has inspired me to research further for Hauraki
- The ethics stuff with Maui
- Knowledge of shell/Bash and the framework Maui talked through
- Definitely how to apply Māori data sovereignty principles in a practical way
- How Māori have developed their own interpretation about the kaupapa using tikanga
- Where to draw the line when data is considered a taonga
- The coding session will be useful moving forward.
- Bash and due diligence

Was there anything you did not understand during today's sessions?

- I think the subject were quite different so maybe how they relate to each other
- Took me a while to get coding down but got better as the session went on
- Lennox coding was new to me, but I enjoyed learning this and would like an opportunity to explore this further.
- I would like to discuss some aspects with Prof Hudson
- CODING session
- I wondered about e sports and data, especially in the context of the other mahi felt quite different, great korero but wasn't sure how to relate it

- Coding was very difficult, way out of comfort zone but appreciate the opportunity. Got lost in the last half hour but all good lovely presenters
- It was a bit overwhelming. Not clear what the main objective of each talk related to Indigidata

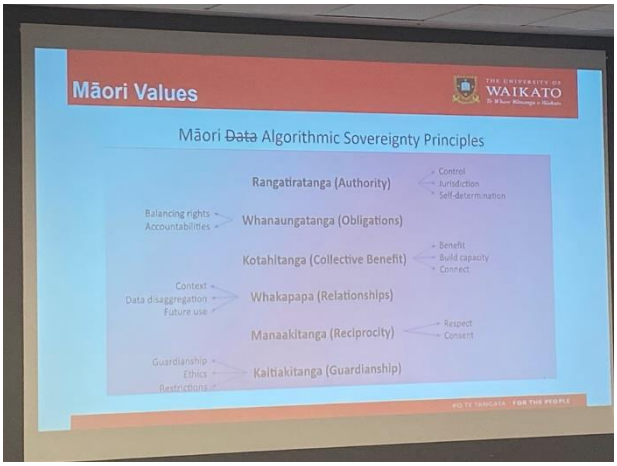
What is the most valuable thing you learned today?

- Bash coding
- We have as a group very different perspectives due to knowledge and experience
- The programming
- Still digesting it all
- Data sovereignty is a complex kaupapa
- All the knowledge was valuable in different ways
- The tenacity of people who continue to push the boundaries in the tech and AI spaces whilst ensuring indigenous integrity kawa is applied
- the need for substantive need to understand tikanga
- lots can't pick just one
- Probably Māori Privacy and ethics
- The TK labels
- Shell/Bash
- Ngā tikanga Paihere
- Loved the tainui- tanga that we learnt today, being marae-based. Having kaumatua there with us learning was very special
- The BASH session! Would love to learn more in the context of the type of analyses available/how to utilize it
- That gaming and e-sports aren't what they used to be
- There is not enough expertise to design and implement the data infrastructure needed. There is opportunity there for Māori to upskill in and be in control of. It is too early to think about AI.

Day 3 - Rāapa, 23 o Hereturikōkā (Wednesday, 23rd of August)

9am - 10.30am	**Coding session** - *Dr Nick Lim* **TAIAO – Scikit-learn (Machine learning)**
10.30am - 11am	**BREAK**
11am - 12.30pm	**Decolonising Algorithms** - *Dr Paul Brown*
12.30pm - 1.15pm	**LUNCH**
1.15pm - 2pm	**TAIAO Session** - *Prof Albert Bifet*
2pm - 3pm	**PANEL DISCUSSION -** *Moderator Assoc Prof Maui Hudson* **Part 1:** NESI (Nick Jones), Genomics Aotearoa, REANNZ (Aaron Murrihy) UoW How Infrastructures work
3pm - 3.30pm	**BREAK**
3.30pm - 4.30pm	**Mauri Model / Mauri-o-meter** – *Tasman Gillies*
4.30pm - 4.45pm	**Participant evaluations of day**
6pm	**Dinner at Alpino Restaurant in Cambridge**

The focus today was primarily on environmental data and included coding workshops with the Taiao Team and presentations from a variety of speakers. This was followed by a shared dinner at the Alpino restaurant in Cambridge.



Tauira responses to Day 3 were captured as follows:

What did you enjoy most about today?

- Networking and exposure to work that is happening in the background

- Really enjoyed the not a panel discussion, found it really valuable getting to talk about the kaupapa that we had been learning throughout the week
- Overall, the daily course content was satisfactory for the introduction to DS. The speakers were of high quality. Well worth attending. Congratulations on the stewardship of logistics, course content and delivery and leadership. Thanks on behalf of Gloria and myself. Ngaa mihi.
- Seeing reactions to mauri model
- That it was in the interest of our whanau
- The ideas discussed in the "decolonising algorithms" section were most fascinating
- Dr Kepa Morgan korero
- Learning about what tools are available
- Group work
- The application of the Mauri-o-meter
- Mauri Model and Dr Paul Brown
- Everything but the coding
- "Not a panel session" and Dr Kepa's talk
- The group discussions we had during a couple of the sessions. It gave an opportunity to unpack some things and get other views and opinions on the topics.
- Decolonizing algorithms by Paul, favourite session so far, well explained and nice to have a discussion after rather than one group discussion that shifts the conversation away too far
- The discussions
- I enjoyed the Panel, I think it would be good to focus on it more to see others people's view points

What did you learn during today's sessions that you anticipate using in the future?

- The Mauri Model and using it for work & listening to Tasman Gillies Journey
- some of the key take aways from the day, especially from Dr Paul Brown's talk
- Use of the R language as an alternative to MS Excel for hapuu or iwi manipulating data. While both are equal to the task the fact that R is open source may appeal to the client. A tribute to Ross Ihaka of Ngāti Kahungungu as co-equal partner who developed the statistical tool.
- Police profiling
- The opportunities of new people to work with
- Mauri o meter
- Mauri Model
- mauri model
- All components
- Great Mauri Model and Dr Browns work
- I enjoy Paul Brown session, learnt heaps
- The mauri-0-meter and how it could potentially integrate into my masters thesis and future studies
- The Mauri model was quite compelling and a nice way of really keeping things simple but impactful.
- Biases in algorithms and utilising the MA principles and mauri model
- Knowing when the applications of indigenising and decolonising can be used in algorithms and statistical methods.
- The information from others that influenced me

Was there anything you did not understand during today's sessions?

- All was clear. Thanks
- Python coding session was a bit over my head
- Coding
- all were satisfactory. high quality presentations
- Coding session and him talking to fast. It was hard to understand what we were meant to do.
- TAIOA session.
- The coding session was a little confusing to understand what we were doing. I felt it was missing the bigger picture of a narrative that would have made the session easier to understand.
- The machine learning session. I think it needed to be better contextualized and simplified ie. What is machine learning and where is it used. I think having questions and discussion throughout shifted the conversation too far away into too many topics that actually made it more confusing as well as trying to cover too many technical aspects.
- The coding in the morning went too fast for the amount of content. Might be better to do less and go in depth

What is the most valuable thing you learned today?

- that if you're are passionate enough about an issue that you will find a way of solving that issue
- need to think about the people behind the data when doing research
- An expert's presentation of the R language tool.
- Some interesting work being done in Aotearoa
- The work people are already doing in the space of AI and machine learning, especially combatting the misuses of such technologies
- Mauri o meter
- Mauri model used in Environ Court
- mauri model
- Skill levels of the presenters-special to Dr Paul Brown.
- Knowledge that we need to support more Māori into these disciplines
- All sorts
- Decolonising - Indigenising
- That all the people around me are full of knowledge and experience. It's a very humbling experience.
- Algorithm explanation was really great, input algorithm output and potential biases at all levels
- The importance of working with people from other areas not similar to yours. The concepts outside of my area of expertise is very important to learn. Especially when being exposed to ingenious sensitive data.
- The information during the panel and other view points

Day 4 - Rāpare, 24 o Hereturikōkā (Thursday, 24th of August)

7.30am - 8.30am	**Breakfast (accommodation)**
9am - 10.30am	**R - Workshop 90 mins** - *Dr Tyler McInnes & Matt Bixley* *R is used worldwide in scientific fields as a powerful language for asking statistical questions and creating publication-quality figures. You will use the R programming language to investigate large, publicly available biological data sets. You will be introduced to functions and get an understanding of how R can be used to hold and manipulate data while identifying medically relevant genetic variants that show population-specific differences. Then you will learn how to use R to create stunning visualisations of your data using R's "Grammar of graphics".* *MSB 1.26 & 1.27*
10.30am - 11am	**REANNZ 101 Talk -** *Dr Aaron Murrihy* *MSB1.36*
11am - 11.30am	**Information searching in Te Reo** - *Dr Nic Vanderschantz* *MSB1.36*
11.30am - 12.30am	**Wrap up and Poroporaki**
	LUNCH - Grab and Go

The final day provided an opportunity to extend coding knowledge with a workshop on R, a computer language developed by Dr Ross Ihaka. We also had talks about REANNZ and a research project supporting information searching in Te Reo Māori.

What is the most valuable thing you learned this week?

- Everything...I enjoyed learning about every aspect that was discussed
- Algorithm blow my mind, Takiwa, kaupapa awesome
- The technical aspects of Data Science are consistent with other tertiary institutes abroad. This is the easy part. Its the mātauranga Māori aspects that need more ti.me and effort. Check out my Linkedin page at LL (Ed) Robson
- Indigidise vs decolonise
- right data and bad data
- The importance of data sovereignty and its impact on algorithm bias. This discussion taught me to be aware of indigenous data and decolonising data
- I really cannot say - I feel like this kaupapa is dynamic due to the autonomy of respective spaces/whanau. I loved every aspect of the wananga, and believe indigenous data is a culturally qualitative therefore parameters are dynamic and subject to the autonomy of the indigenous entity
- Personally it was everyone's viewpoints and why they have them. I might disagree but still understand their viewpoints
- Data is currency, data is power, data is control. This is more than enough motivation to protect Māori data from exploitation

What did you learn during Indigidata 2023 that you anticipate using in the future?

- I will try my best to tell all the tamariki I come across to look at Data and Computer science as a future career. Especially if they are interested in these subjects at kura already. Inform them of the opportunities available to them if they choose to pursue this career
- Lots just understanding on where does Māori sovereignty data site in this I.t world? It's robust korero to have and understand it broken down
- A course outline for my iwi and hapuu
- Limit use of te reo in AI providers to maintain its integrity and mana
- good so far but things may change with new tech!
- Everything
- Firstly I enjoyed it lots so will try do events such like it more often. Also just how important data is to people and how unimportant to others
- I gathered a holistic approach and was brought up to speed on where its heading in the future. Yesterday, I was with James Paul Govt Chief Digital Officer at Internal Affairs who I could keep up with cause I had learnt the language and had a good grasp of the ecosystem

What is the most valuable thing you learned this week?

- 30 to 45 mins of talking and 30mins of interactive games and tools. Some people I knew were struggling to focus all day to people talking so mixing it up a bit will help people get excited and engaged in the topic. More commercial models of success in this industry. Alot of R &D but most people will work in a commercial model most of their life
- Location was great, more examples on how things are used as in data information? Hapū/Iwi spaces
- There were some things creeping to the Māori technology vernacular that need to be peer-reviewed otherwise the subject begins to look scruffy. Data Science is elegant keep it that way. One presenter (without tertiary education) was adding words to the established framework just for the sake of saying it is Indigenous. ie Indigenous Cloud. No such thing exists. Keep it scientific and precise. Very much like Tikanga Māori
- Schedule - allow time for discussions, even if that means fewer talks
- Less talks so that participants can spend more time on a project and working as a team to solve a common problem with our combined backgrounds. Maybe using the Mauri o meter as an example of what can be achieved. I also think that the coding sessions require more time to learn for the audience that was present
- Aspects of the kaupapa require cultural change - how do we normalise indigenous practise to normalise this culture
- Another day will help with time pressure. But more Panels to see everyone's viewpoints more instead of everyone thinking everyone agrees
- I enjoyed it but was kinda info overload so maybe all presentations could have been pre-recorded and we viewed 2 weeks prior then we could have just had a summary and planned to discuss all the content in an interactive workshop style in smaller focus groups. I was more interested in how we could bring the tools home to reach outcomes relevant to our community

Any final comments about the wānanga?

- I would do it again and I found it a lot of fun :) So grateful for the opportunity and I feel truly blessed

- Well organised by Maui and Te Kapa. Special shout out to Susan and Tuti for looking after us all. ngaa mihi ki a koutou
- Thank you for facilitating an amazing opportunity, and for being so welcoming. Fantastic people and loved hearing everyones perspectives and walks of life. An experience I will treasure. Ngā mihi maioha
- have the information early and send time to be updated ! but overall all good thanks again ,
- Priviledged for the great experience and it was really enlightening. I understand it was the first of many so rooting for the next participants to have a much better experience
- Excellent - loved it, please invite me again!
- It was really fun and I enjoyed it lots. Thank you very much for the opportunities and you guys did a brilliant job :)
- Māori data Governance is definitely a space I want to be in and hope to keep ahead of the game. Any future events please keep me in the loop. I identified plenty of opportunities so would be good to collab further. We are in the process of setting up a Māori A.I Research Centre to train people in this Field so any help would be appreciated. Please could we also get copies of all the presenters slides cause we plan on having a debrief on it as soon as it comes thru. Thanks for putting the programme together, really awesome kaupapa. If you are keen to come to Waitangi in the future please let me know as I'd be keen to help organise. Mauri ora



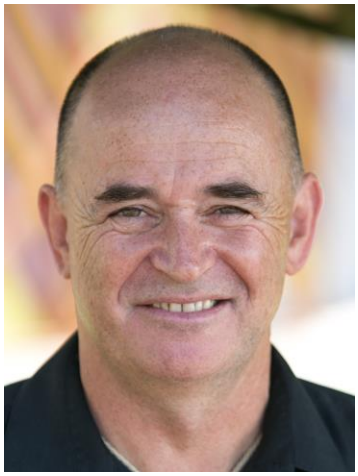

Speaker Biographies

Dr Kali Dale

Kali Dale is from Bemidji, MN, USA and a citizen of the White Earth Nation of Ojibwe Indians. She earned her doctorate in Oncological Sciences from the University of Utah in 2022 researching transcriptional regulation in cell growth signaling that is often mutated in several cancer types. Dr. Dale is a postdoctoral researcher at the Native BioData Consortium where she manages the laboratory with the first next generation sequencer on a Tribal reservation. Her current areas of research are COVID-19 testing and sequencing, spatial transcriptomics, and Indigenous Data Sovereignty.

Associate Professor Maui Hudson

My Iwi affiliations are Whakatōhea, Ngāruahine, and Te Māhurehure. I am an interdisciplinary researcher and currently hold a position as the Director of the Te Kotahi Research Institute. I am a founding member of Te Mana Raraunga Māori Data Sovereignty Network and the Global Indigenous Data Alliance as well as a co-author of the CARE Principles for Indigenous Governance. I am a Co-Director of Local Contexts and co-developer of the Biocultural Labels. I am also a Co-Director of the Veracity Lab and ENRICH Equity for Indigenous Research and Innovation Coordinating Hub.



Associate Professor Te Taka Keegan

Nō Waikato-Maniapoto, nō Ngāti Porou, nō Ngāti Whakaue hoki. Kei Ngāhinapōuri e noho ana, kei te pūtake o te maunga o Pirongia. Kua roa ia e mahi ana ki te Whare Wānanga o Waikato, me tana aro ki te whai huarahi mō te reo rangatira ki te ao hangarau. Te Taka received a Diploma in Computer Engineering from CIT (Wellington) in 1987. He spent six years working as a hardware engineer for Datacom and Digital before returning to the Waikato and Waikato University. He received a BA through the Te Tohu Paetahi stream (Māori immersion) and in 1996 was awarded an MA having completed a thesis on traditional navigation. Te Taka worked with the Māori Department and then in 1997 switched to the Computer Science Department. He completed a PhD in 2007, titled Indigenous Language Usage in a Digital Library: He Hautoa Kia Ora Tonu Ai. Te Taka has worked on a number of projects involving the Māori language and technology. These include the Māori Niupepa Collection, Te Kete Ipurangi, the Microsoft keyboard, Microsoft Windows and Microsoft Office in Māori,

Moodle in Māori, Google Web Search in Māori, the Māori macroniser and SwiftKey for Māori. In 2009 Te Taka spent 6 months with Google in Mountain View as a visiting scientist assisting with the Google Translator Toolkit for Māori. Further work with Google led to Translate in Māori. In 2013 Te Taka was awarded the University of Waikato's Māori/Indigenous Excellence Award for Research. In 2017 Te Taka was awarded the Prime Minister's Supreme Award for Tertiary Teaching Excellence.

Dr Warren Williams

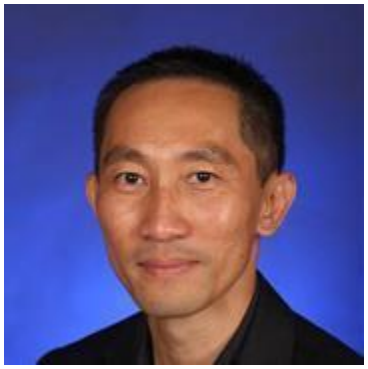
Dr Williams has extensive experience in IT, business and tertiary education spanning more than 25 years. He has held executive and senior management roles, and is active in tribal and community-level groups.

As the Chief Executive for 20/20 Trust, he is passionate about enabling and empowering people through education and technology. Digital inclusion programmes are the core of the 20/20 Trust service provision.

Experienced in hapū and tribal kaupapa he's contributed to portfolios such as Treaty Negotiations, Environment, Education, Research, Employment, and key relationships in the Waikato including local councils and the business community. His governance and leadership experience includes national and regional boards, working with Māori and entrepreneurship groups, digital technology advisory groups for Government and NGO's forums, and regional economic development.

Professor Tahu Kukutai

Tahu is a Co-Director of Ngā Pae o te Māramatanga and is Professor of Demography at the National Institute of Demographic and Economic Analysis, University of Waikato. She specialises in Māori and Indigenous demographic research and has written extensively on issues of Māori population change, Māori identity, official statistics and ethnic and racial classification. She is a founding member of the Māori Data Sovereignty Network Te Mana Raraunga and the Global Indigenous Data Alliance. She co-edited the landmark book *Indigenous Data Sovereignty: Toward an Agenda* (ANU Press) and a forthcoming edited volume *Indigenous Data Sovereignty and Policy* (Routledge). Tahu has undertaken research for numerous iwi, Māori communities, and Government agencies, and is a member of the Chief Science Advisor Forum. She was formerly a journalist and has degrees in History, Demography and Sociology from The University of Waikato and Stanford University.



Dr Alvin Yeo

Alvin Yeo develops, manages and runs the Work Integrated Learning (WIL) component of the MInfoTech (Master of Information Technology) postgraduate programme at the University of Waikato, New Zealand. The MInfoTech is offered under the Auckland ICT Graduate School (AGS), a partnership between University of Auckland and University of Waikato (under the purview of the School of Computing and Mathematical Sciences (SCMS)). In addition to managing the internships, Alvin helps connect industry and community with SCMS, specifically, the researchers in the Computer Science Department, Software Engineering Department, Design Department and the Mathematics & Statistics Department. At present, Alvin convenes and co-teaches the CSMAX570 paper, Preparing for the ICT internship. The paper was designed based on research carried out with Wilf Malcolm Institute of Educational Research and Centre of Tertiary Teaching and Learning. Prior to this role, Alvin Yeo conducted research and worked in the area of Information and Communications Technologies for Rural Development (ICT4D). He has been involved in R & D (Malaysia, Japan, EU funded) projects. These projects were conducted in partnership with government, industry and indigenous communities in remote and rural locations in Malaysia. Alvin continues to work in the area of Community Engaged Learning with a Māori community.

Professor Annika Hinze

Annika Hinze is a Professor in Computer Science at the University of Waikato, and Head of the School for Computing and Mathematical Sciences (CMS). She originally studied Technical Mathematics, Computer Science and Electrical Engineering at the Technical Universität Berlin, Germany and received her PhD in Computer Science from the Freie Universität Berlin, Germany., She joined the University of Waikato in 2003. Her research interests include location and event-based systems and digital libraries. Her work in location and event-based systems is concerned with algorithmic aspects of detecting complex patterns in data, such as detecting hazard patterns in data streams from forestry workers wearing smart vests in dangerous work environments. Her research in the digital library field centres on the boundary between algorithmic processing and user interaction, such as identifying semantics of information, modelling of delivery context, and the question of how best to display information to the end-user. Her research often involves cross-disciplinary contexts, involving colleagues and industry partners from science, geography, education, and Māori/Indigenous studies. She strongly believes in the benefits of collaboration, coaching and mentoring, and is enthusiastic about technology for good.

Natalie Kusabs

Ngāti Tūwharetoa, Ngāti Maru ki Hauraki, Ngāti Raukawa and Te Arawa. Business Manager at Te Mata Punenga o Te Kotahi (Te Kotahi Research Institute) working collaboratively with the iwi, hapū, and hāpori of Te Whare Wānanga o Waikato and University of Waikato researchers. Project Manager (and a researcher) for the MBIE Endeavour Tikanga in Technology project creating a more culturally responsive digital environment for Indigenous communities. Researcher on SRF Pātai: Examining Te Reo Māori Internet Search aiming to develop tools and resources to support online activities for reo Māori speakers. Using experience in Work-Integrated Learning (WIL) to connect Maōri organisation/mentors and tauira through the University of Waikato undergraduate WIL programme. Previous experience in tertiary and secondary science education, post-harvest horticultural engineering and plant physiology research.

Dr Nisha Ghatak

Nisha is a Research Communities Advisor and Training Lead at New Zealand eScience Infrastructure (NeSI). Her research and publication background is in postcolonial literary theory and digital humanities. She's passionate about the community building aspect of her work which enables her to connect with researchers from different domains and assist them in advancing their digital skills. Nisha is also the Regional Coordinator and Executive Council member for The Carpentries. Before her current role, she was a Postdoctoral Fellow at the University of Auckland.

Dinindu Senanayake

Dini is a Research Support Specialist at New Zealand eScience Infrastructure (NeSI) with a particular interest in Genomics and Bioinformatics. He joined NeSI following half a decade of research experience gained in the field of Cancer Genetics, Chemical Genetics and Bioinformatics.

Vanessa Clark

Vanessa is Pouhere Kanapu | Executive Director of Kanapu, under the korowai of Ngā Pae o te Māramatanga Māori Centre of Research Excellence and based at the University of Waikato. Vanessa spent the majority of her career in the Information and Communications Technology
sector in Hong Kong, the UK, Australia, and the USA. Since returning to NZ in 2011, Vanessa
has held a variety of roles in the private and public sectors; including Kā Hao Māori ICT Development Fund (Advisor), Te Māngai Pāho (Board member) and Science for Technological Innovation National Sciences Challenge (Kāhui Māori). In 2021, she was elected to Te Arataura, the tribal executive of Waikato-Tainui. Her research interests include: Māori data sovereignty and entrepreneurship. She has a Bachelor of Business Studies in 1992 (Massey) and Masters of Management Studies in 1998 (Waikato).

Kevin Shedlock

Ko Kevin Shedlock (nee Walker) toku ingoa Ko te whare tapu o Ngapuhi raua ko Ngati Porou me ki Whakatōhea te iwi Ko Ngati Hau, Te Kapotai, Te Aitanga a Hauiti ngā hapū Mauri ora!! Technology framed as "the digital artefact" is altering the way indigenous peoples live their lives opening many challenges to both their heritage and traditions as a representation of their digital selves when engaging technology. Whilst the IT artefact offers new ways for indigenous peoples to revisit heritage stories using the likes of virtual reality or technology that is immersive, interactive and intelligent, concerns are being raised in the way indigenous knowledge is being produced, stored, augmented, and disseminated. On the one hand, tribal knowledge contains well-rehearsed processes and practices commonly found within an individual, group, community, or in artefact format. On the opposing hand, the IT artefact is becoming a container for tribal knowledge constructed for similar purposes replacing the former as holders of knowledge. Currently no practice exists to guide the construction of technology aligned with indigenous understandings during the creation of knowledge. My research involves working with indigenous communities to better understand technology within an indigenous lens. I am interested in virtual reality technology that delivers perceived awareness connections and embodied sensory connections within an indigenous socio-technical system (iSTS). This involves: - Organising the construction of the IT artefact ex-ante/ex-post. - Working with indigenous data filters in an immersive, interactive and intelligent setting. - Being spatially located inside technology such as virtual reality.

Zane Rawson

Ko Zane Rawson toku ingoa

Ko Te Rarawa te iwi

Ko Ngati Manawa te hapu

I am a masters student at Te Herenga Waka - Victoria University of Wellington in the School of Information Systems. My background is in a mix of information systems and computer science with a particular focus in AI & ML. My current research involves working exploring factors of trust from a Māori perspective and how these can be incorporated in the development of an IT artefact. I am particularly interested in artificial intelligence and how these factors can be incorporated to create an intelligent agent that takes on a te ao Māori perspective.

Dr Nick Lim

Tēnā koutou katoa,
Ko Bukit Mertajam te maunga,
Ko Sungai Rambai te awa,
Ko Penang te motu,
No Malaysia ahau,
Ko Lim tōku whanau,
Ko Nick tōku ingoa.
Nō reira, tēnā koutou, tēnā koutou, tēnā koutou katoa.

I am a postdoctoral research fellow doing research in machine learning and artificial intelligence. I obtained my MSc (Mathematics) and PhD (Statistical Learning) from the University of Waikato and my doctoral dissertation is on "Ensemble learning of High Dimensional Datasets". Prior to doing my graduate studies, I worked in a semiconductor MNC as a component design engineer. I am passionate about technology, education, social justice and the welfare of children. In my free time, I enjoy photography, music, paper craft, cooking, and the mountains.

Dr Paul Brown

Ko Karioi tōku maunga Ko Whāingaroa me Kāwhia ōku moana Ko Tainui tōku waka Ko Tainui me Ngāti Hikairo ōku iwi Kei te noho au ki Kirikiriroa Ko Paul Brown tāku ingoa I am an early career researcher in Statistics, with research interests in computational Bayesian inference and statistical modelling. Currently, I am working on projects with police on a range of projects, including statistical modelling of crime and crime patterns in Kirikiriroa (Hamilton). As the use of data and algorithms in society become more prevalent, it is important that we understand the benefits and pitfalls that this may cause. On that front, I am

interested in issues of algorithmic bias - especially in the context of Aotearoa New Zealand, and am involved in projects that include Māori data and digital sovereignty.

Professor Albert Bifet

Albert is a Professor of AI, Director of the Te Ipu o te Mahara AI Institute at the University of Waikato and Co-chair of the Artificial Intelligence Researchers Association (AIRA). His research focuses on Artificial Intelligence, Big Data Science, and Machine Learning for Data Streams. He is leading the TAIAO Environmental Data Science project, and he is co-leading the open source projects MOA Massive On-line Analysis, StreamDM for Spark Streaming and SAMOA Scalable Advanced Massive Online Analysis. He is the co-author of a book on Machine Learning from Data Streams published at MIT Press. He served as PC Co-Chair of DSAA 2021, Co-Chair of the Industrial track of IEEE MDM 2016, ECML PKDD 2015, and as Co-Chair of KDD BigMine (2019-2012), and ACM SAC Data Streams Track (2023-2012).

Dr Kepa Morgan

Dr Kēpa Morgan of Ngāti Pikiao, Te Arawa whānui, Ngāti Kahungunu and Ngāi Tahu is Pou Hautū (Managing Director) for Mahi Maioro Professionals Limited and a Distinguished Fellow of Engineering New Zealand. Kēpa and his team combine mātauranga and science and engineering technologies to holistically evaluate and communicate ecosystem impacts using the mauri0meter and the Mauri Model Decision Making Framework. Their focus is Te Mana o Te Wai, and the creation of monitoring systems for communicating changes in the mauri of freshwater bodies (puna, awa, roto, ngae) and mauriora, and the assessment of impacts on mauri resulting from municipal infrastructure. These assessments are used to demonstrate whether or not projects achieve infrastructure belonging. Kēpa is a Ngā Pae o Te Maramatanga Fulbright Senior Scholar and in 2016 was awarded the Institution of Professional Engineers Furkert Award for Engineering Excellence in Green and Sustainable Technologies.

Dr Aaron Murrihy

Dr Aaron Murrihy is the technical lead for networks at REANNZ. His passion is for building simple, reliable, scalable networks and advocating for the same within the REANNZ membership. He is responsible for ensuring security of the REANNZ network infrastructure as well as driving innovation in the network space through adaption of new technologies and automation orchestration. Outside of work he can usually be found hitting the local trails on his mountain bike or with a ball on the futsal court.

Dr Tyler McInnes

Kia ora! I grew up on a dairy farm north and east of Whangarei out towards Whananaki South, and I loved biology from as early as I can remember. I went to the University of Otago to study a Bachelor of Science in Genetics and graduated after doing an Honours project looking at the genetics of plant-microbe symbiosis that allows some plants (legumes) to fix nitrogen from the atmosphere. I then did a PhD in Biochemistry studying epigenetic modifications, called DNA methylation, in colorectal cancer. During my PhD I was introduced to the field of bioinformatics and it was a steep learning curve teaching myself a programming language and some statistics. After completing my PhD I worked as an Assistant Research Fellow in the department of Zoology, analysing RNA-sequencing data to investigate limb development and regeneration in the frog *Xenopus laevis*, before starting a full-time permanent position as a Teaching Fellow in the Genetics Teaching Programme. In mid 2022 I took up a position as Bioinformatics Training Coordinator for Genomics Aotearoa where I oversee a portfolio of workshops to train scientists in bioinformatics and genomics. In this role my goal is simple: to upskill researchers in bioinformatics and genomics. In practice this means that I work with experts in the community who have very specific knowledge and together we package that information into something that can be taught and shared with other people.

Manaaki Vercoe-Kameta

NBA2K Professional Player - Top 20 player in Asia Pacific. Competed in multiple online and in person tournaments around the world.
Created Rotorua primary and intermediate Esports academy in 2020.
NZMA Tutor for Esports level 3-4 (PTE) Owner of ESM - Creates Esports and Digital literacy programs for schools and NEET learners. “The reason I got into education is because I wanted to change education. You can’t doing anything about it looking from the outside”.

Dr Nic Vanderschantz

Previous to moving to the University of Waikato, I taught at Wanganui School of Design. I hold a Masters in Computer Graphic Design as well as a Doctor of Philosophy in Computer Science. I have worked at the university since 2005 and I am working at the crossroads of Design and Computer Science. My research and teaching experience allows me to work in and lead interdisciplinary teams with colleagues and students in Design, Computer Science, Education, Library Science, Engineering and Health. I have also had the privilege to work on a number of multicultural projects and have in recent years worked with students and colleagues to investigate bilingual information systems and interfaces. We have considered the linguistic landscape of dual language picturebooks, typographic presentation of indigenous languages, as well as the development of mobile apps, to support and encourage indigenous language revitalization and cultural knowledge retention.

Nick Jones

Nick is an experienced public sector leader, with a grounding in design thinking and innovation and technology diffusion. Nick founded and leads the New Zealand eScience Infrastructure (NeSI), a NZ research sector infrastructure investment. NeSI delivers powerful advanced research computing platforms and skills, and is a leading voice supporting digital innovation in research across a diversity of research communities nationally. Nick has been a director in several of his own private companies and partnerships, has been a board member of an incorporated society, and an advisory board member for several research centres and public sector initiatives and organisations.

Matt Bixley

Matt has worked in the Research Support team at NeSI for the past three years which is somewhat of a dream job - just helping other people do Science. He has a background in Quantitative Genetics, Statistics and Bioinformatics having worked with AgResearch for 20 years on Sheep, Deer and Cattle before a stint with Otago University working on Gout and Diabetes research in Māori and Pacifica populations. Outside work Matt spends a lot of time with a map and compass in hand exploring/racing around in the back country and getting into the nooks and crannies of Aotearoa and the world. He is President of the International Rogaining Federation (like orienteering but longer) where the focus of the role is a balance between competitive sport, engagement and participation.