advance

Spring 2013

Research with impact

Protecting our urban forest

Creating an arboretum at Unitec's Mt Albert campus

Unitec
Institute of Technology
TE WHARE WĀNANGA O WAIRAKA

contents

editor Simon Peel
writer Trudi Caffell
design Nadja Rausch
cover photo Simon Riera
printing The Image Centre

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Unitec Institute of Technology
Private Bag 92025,
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Auckland 1142, New Zealand
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phone 0800 10 95 10
web **www.unitec.ac.nz**

Creating impact through partnership

Unitec Institute of Technology is a member of a group of large metropolitan institutes of technology and polytechnics (ITPs) called the Metro Group. Collectively, and as part of an on-going conversation with government, we have been attempting to articulate the unique role that ITPs play in New Zealand's research and innovation scene.

Often when people consider the investment that government makes in research and innovation in New Zealand it is the Universities and Crown Research entities (e.g. NIWA and Callaghan Innovation) that are mentioned. This is understandable given the large amounts of financial investment made in these organisations, their research intensity, and the worthwhile outcomes of their work. That said, the work completed at ITPs sometimes flies under the radar. This magazine is one way we try to get our message out; by telling our research stories.

As part of communicating the value of research and development work done in the ITP sector we recently held a two-day symposium and industry showcase event in Wellington to which a range of government and industry representatives were invited. Each Metro ITP displayed one or two projects that exemplified how we do research and development in partnership with industry and business. Unitec's contribution was the whole house research project that provides an on-going, real-life test bed for building materials, construction techniques and building performance modelling. Readers will recall several stories we have written on various aspects of this project.

The wide range of projects presented by the other ITPs was impressive and included everything from a new type of wind turbine, an innovative exercise bike for people recovering from illness and farm management software to imprinted polymers. One thing that struck me was how relatively small amounts of investment, applied in the right places, can produce highly innovative and very valuable outcomes.

The government would like to see more alignment between institutions engaged in research such as Unitec, and the needs of industry and other community stakeholders, with less reliance on government support. Fortunately this is a direction of travel that comes naturally to Unitec and one that we emphasise through our strategies and everyday actions.

We believe our research has much more likelihood of being useful and providing impact when it is in partnership with the people who can actually make good use of that research and innovation.

If you want to know more about our work at Unitec please contact anyone featured in this issue of Advance or go to **www.unitec.ac.nz/research**

Associate Professor Simon Peel
Dean of Research and Postgraduate Studies

Lichen the new name

Unitec Natural Sciences Senior Lecturer Dan Blanchon recently had a species of lichen named after him by Chicago's Field Museum of Natural History.

Having a species of lichen named after him was recognition that Natural Sciences Senior Lecturer Dan Blanchon wasn't expecting – at least, not this early in his career. "You're not allowed to name species after yourself, it's not the done thing," he says. "So generally it's people who are later in their careers, or people who do something amazing who have a species named after them. I was quite surprised and blown away to have one named after me this early in my career. It's quite an honour."

The new species was originally part of the species Cladia aggregata. "It's found worldwide," says Blanchon. "Researchers at the Field Museum of Natural History in Chicago did some DNA work, and I sent them some specimens from Unitec and other places, and that bit of Cladia aggregata, one of the Australasian species of Cladia aggregata, was renamed Cladia blanchonii by Dr Thorsten Lumbsch and Dr Sittiporn Parnmen."

For those who want to find it, the newly renamed lichen can be found on Unitec grounds. "It's small, quite tubular, and it looks a little bit like crushed instant noodles. It's called a coral lichen, because it looks a little bit like coral, and it commonly grows on volcanic rocks. There are several volcanic rock outcrops on campus that are part of the lava flow that Unitec is built on."

According to Blanchon, the Cladia blanchonii lichen is an important part of our ecosystem. "It's part of the native biodiversity of our campus. Most of our campus is exotic plants – all the grasses are exotic, many of the trees are exotic – but when you look at the rock outcrops, all the lichens that are growing on them are native. So the rocks are hotspots of native biodiversity, and Cladia blanchonii is one of those species."

Blanchon is a strong defender of the importance of lichens, saying that they are ecologically important, but often overlooked. "This particular lichen would be habitat for insects that birds will eat, and it will also break down and make soil. So on somewhere like Rangitoto Island, where these lichens live and die, they break down and make soil for other things to come in. It's one of my crusades to raise awareness of lichen biodiversity, and all my research is around elucidating what biodiversity we have.

"New Zealand is really diverse in lichens; we have 1800 species, which is about 10 per cent of the known lichen species in the entire world. So from a biodiversity point of view, it's really important."

He says it's the uniqueness of studying lichens that attracted him to the field. "I think it's because very few other people study them, so there's a lot of work that needs to be done. We know most of our trees and shrubs really well, but the lower plants, and things like lichens, we don't know so well.

"And I just find them interesting: they're one of those unsung heroes of the New Zealand ecosystem because they have a lot of jobs, they're involved with soil formation, they harbour insects, and some of them leak nitrogen to fertilise other things. They're just really interesting."

An exciting new relationship

Unitec and the Nara Institute of Science and Technology (NAIST) in Japan have signed a Memorandum of Understanding (MOU) that will enhance co-operation between the two institutions by offering an exciting new dual doctoral programme.

Signed during a visit to Japan by Unitec Chief Executive Dr Rick Ede, this initiative will enrich research collaboration, strengthen international relationships and encourage academic exchanges of doctoral students.

NAIST has been the top-ranked national university in Japan over the past three years for both research and education, based on the quality of its postgraduate programmes. As a national university consisting solely of graduate schools that specialise in teaching and research in advanced science and technology, NAIST tackles problems at the frontiers of science in an environment of interdisciplinary and international cooperation.

The opportunity for Unitec to work with this highly rated university is globally significant, and a huge boost for the Computing Department.

Computing Head of Department Hossein Sarrafzadeh says of the new MOU: "Through this initiative, Unitec students will get the opportunity to undertake high-level research in cutting-edge areas of information science and build on the experience gained at Unitec's Cyber Security Research Centre."

Unitec Chief Executive Dr Rick Ede and NAIST President Dr Naotake Ogasawara at the signing of the MOU.

New Head of Department: John Stansfield

Newly appointed head of the Social Practice Department John Stansfield says he's been working in hot and dangerous countries for much of his working life. "I went to Papua New Guinea for the first time in 1976 as an 18 year old. It got deeply into my blood and it's never left. I've spent about a third of my working life in the Pacific. I'm fluent in Melanesian languages, and I love it."

Now living on Waiheke Island, Stansfield says his main career and research focus started as a question raised during his time at Unitec as a lecturer in the '90s. "I started to think, 'What if the most important piece of biodiversity at risk from extinction is not Hochstetter's frog? What if it's the way that we know and understand and decide things? The way we manage? What if there was a kind of extinguishing of diversity as a result of a cultural juggernaut out of the US, that says there is one truth about how you manage stuff, and it's about how white men in suits from Boston manage, and we will go forth and train the entire world to manage in this way.' That was kind of my big thought."

With that big thought in mind, Stansfield studied at the School for International Training in Vermont, US, for a Masters in International and Intercultural Management, before heading to Bangladesh for a year to do a post-graduate diploma in NGO Leadership and Management. Since then he has worked, lived and researched in the Pacific in a range of roles such as a consultant for the United Nations, lecturer for Unitec, and director of advocacy for Oxfam. "I've also had roles for various international agencies, like Save the Children Australia, United Nations Development Programme (UNDP) and the United Nations Food and Agriculture Organisation (UNFAO)."

He says he's excited to be back at Unitec. "There's always a great deal of passion and intellectual stimulation around here, especially at a time when tertiary education is going to change out of sight. I'm looking forward to meeting the challenges head on."

Research Symposium 2013

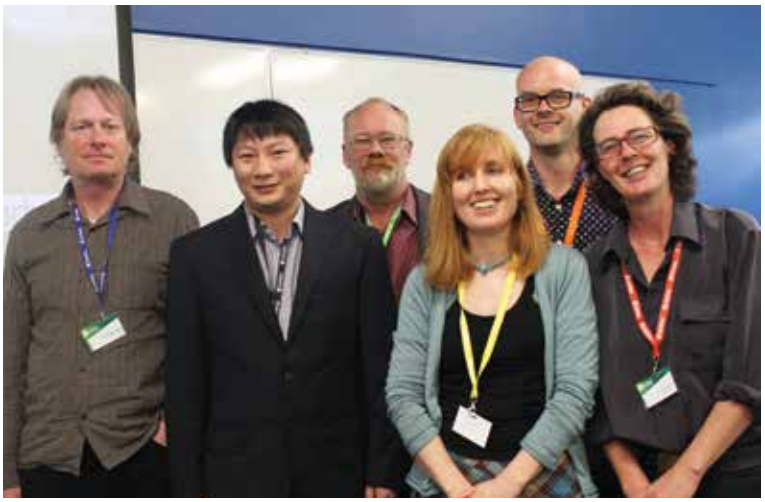
This year's Research Symposium showcased new research from a range of disciplines, the always-exciting Three Minute Thesis competition, as well as a new award to encourage undergraduate students to talk about their research.

The aim of the Research Symposium is to highlight the range of research taking place at Unitec across a broad spectrum of disciplines. It is also a chance for researchers to interact, network, and be inspired by the work being done by their peers.

The big award on the day was the Research with Impact Prize, this year hotly contested by five finalists and judged by a team that included Management and Marketing Professor Pieter Nel, Teaching and Learning Matauranga Māori Josie Keelan, and Executive Dean Academic Development Ray Meldrum.

Natural Sciences Senior Lecturer Mark Farnworth presented his research into the welfare of cats in New Zealand, contrasting the ways in which we deal with them as feral, stray or companion animals. Interacting with the people of Avondale was the central theme to Design and Visual Arts Lecturer Paul Woodruffe's research, in which he used a survey to understand the creative needs of Avondale locals.

Computing Department Doctoral Student and Lecturer Lei Song talked about creating an algorithm to analyse indoor pollution data from NIWA, (see the full article about the project on page 26) while Design and Visual Arts Lecturer Paula Buckley talked about her work to design a new writing aid for people crippled by arthritis. Finally Electrotechnology Lecturer Wayne Holmes spoke about his project to develop a



Clockwise from top left: 3MT winner, Joseph Chalmers. Research with Impact winners Paula Buckley and Jesse Dyer. Research with Impact prize finalists. At the prize giving. Undergraduate Prize competition speakers.

sensor that can assess defects in composite materials, specifically for the marine industry.

The winners were Paula Buckley and Jesse Dyer, with their arthritis writing aid. The research team also included Wendy Hook and Gillian Whalley and was completed in collaboration with the Awhina Waitemata Health Campus and the Waitemata District Health Board. Buckley says she was blown away to receive the prize, for a project that started as an attempt to make the life of her great aunt easier. "It began as a very personal project for me, but after seeing the positive changes in the lives of the people in our pilot, I've realised how much of an impact the pen will actually have. I'm excited that it's been recognised in this way, and I'm proud to be part of this team."

Another hotly contested event on the day was the Three Minute Thesis (3MT) Competition, which has grown in popularity to the extent that heats were necessary to determine the finalists. With topics that ranged from an assessment of online activism in Kazakhstan to the glass ceiling for female executives in the Vietnamese banking sector, it was an exciting and interesting event for listeners.

The winner was Master of Architecture student Joseph Chalmers, who spoke about his research into architectural boundaries through a reinterpretation of the Berlin Wall.

A new event for the Research Symposium this year was the Undergraduate Research Award, which was a chance for undergraduate students to show off the research they are completing as the final part of their degrees. The winner was Bachelor of Construction student Blake Hogarth, who spoke about his research into the cost and value of carpentry apprentices.

Dean of Research Simon Peel says that the event was again a fantastic success for everyone involved. "We use this event to drive the interaction between researchers at Unitec, and we often see collaborations emerge out of this day, whether it's from a casual conversation over coffee at break, or as part of a more formal section of the day. It's exciting to see the sparks first fly in a research idea that has been created through such a collaboration or partnership, and it's integral to the research culture at Unitec."

Global business

Receiving this year's Global Excellence Award from the Global Business and Technology Association (GBATA) was a huge honour, says Unitec's Creative Industries and Business Executive Dean Leon Fourie. "It's recognition of my continued contribution to GBATA. This will be my twelfth year with the organisation; I've been on the executive board for ten years as the Vice President, I serve on the editorial board for the *Journal of Global Business and Technology*, have been serving on the Conference Coordinating Committee that annually organises the GBATA conferences; and I've headed up two of the conferences, in 2004, and again in 2010. In addition to that, I have presented double-blind peer reviewed research papers at each of GBATA's annual international conferences over the past decade."

The chance to network and collaborate on a global scale with a multitude of cultures is part of the reason Fourie chose to join GBATA over other organisations. "GBATA has a truly international flavour, so you not only get exposed to benchmarked practices globally, but you also get the richness of its cultural reach. I also like the duality of it, the association attracts some of the top researchers in their field in the world, but also allow emerging researchers a place. In the time I've been part of GBATA, the membership has increased dramatically – we are represented in 46 countries, and attract around 400 delegates to the conference annually. It's an organisation with a truly global reach."

This year the 15th annual conference was held in Helsinki, Finland, and next year it is going to Baku, Azerbaijan, says Fourie. "It's made up of probably about 65 per cent academics and 35 per cent practitioners from industry and business. The conferences used to be held only in America and Europe, and when I came in I suggested that we go wider, to Asia and Africa, which we have done since then. I intend to bring the conference to New Zealand in the next two years as well, and host it at Unitec."

In Helsinki Fourie presented four papers; was a plenary session respondent, session chair, moderator and discussant at various sessions, and one of his papers was published in the Spring 2013 accredited journal, *Journal for Global Business and Technology.* "The papers are all HR-related. It is research in association with Unitec staff members Professor Peiter Nel and Senior Lecturer Andries Du Plessis, and it spins out of a 25-year longitudinal research project monitoring the efficiency of HR specialists and their contribution to business strategy."

As a senior manager, Fourie says it's tough to maintain the kind of research outputs he aims for. "Remaining research active, whilst doing the day job is a major challenge. In 2009 I set it as a goal to be PBRF rated in the 2012 round, and managed to do exactly that."

watch the video
www.unitec.ac.nz/advance/

photos: Simon Riera

Clockwise from top: The branches of Auckland's largest jacaranda tree near building 48. Senior Lecturer Penny Cliffin and her research assistant Daisy Tang sitting in front of the arboretum sign on Carrington road. Kowhai flowers. Penny Cliffin and Daisy Tang.

Unitec's Arboretum

Creating an arboretum of the trees on Unitec's Mt Albert campus has been a satisfying journey for Landscape Architecture Senior Lecturer Penny Cliffin.

The park-like surrounds of Unitec's Mt Albert campus are worthy of mention on many levels, but of particular note is the vast array of trees and shrubs that cover the 55-hectare grounds, many of which are historically significant or rare.

Establishing an arboretum on campus seemed only logical to Landscape Architecture Senior Lecturer Penny Cliffin. "I started working on the project around three years ago," she says. "One of our aims was to make more of the opportunities at the Mt Albert campus, for both teaching and research purposes. By documenting and managing the trees, we're able to more effectively plan and maintain our collection."

The project began with Cliffin – who did her Master's degree on Auckland's tree collections – investigating what was required to actually create an official arboretum. "I discovered that it needs to include the collection itself, the documentation about the collection, the labelling of the collection, the library associated with the educational scientific pursuit, and a herbarium. So we set about putting that together."

Cliffin and her team of students have now officially catalogued and named over 2,000 trees and shrubs – including more than 200 different species – and labelled around 100 of the most significant trees with the relevant information. With her throughout the process has been Cliffin's research assistant, Daisy Tang. "Daisy is a senior Landscape Architecture student. She has become passionate about trees through her involvement with the project and her work supervising other students in documenting trees has been invaluable, as well as her computer expertise with the database and website."

Tang says it was inspiring to be part of the arboretum project. "The features at Unitec are rich enough to be promoted as an arboretum. It's important to remind people of the great features that are right here, and be grateful for the environment that we're in."

As well as collecting data about the trees from the students, Tang also helped to set up the Unitec Arboretum's website and Facebook page. "My own project for the past year has been based on climate change, which is quite related to what we're doing with the arboretum, in terms of allocating a value to each tree's ability to negate the effects of climate change through the absorption of carbon dioxide," she says. "It's been hugely beneficial for me to be part of setting up the arboretum."

The website has been developed as the main public interface with the Unitec Arboretum and its database of trees. "It has a map on one side with all the icons, to find out the names of the trees – and their botanical names. And if you don't know the name of the tree but you know where it is on campus, you can go to the map and find it there," says Cliffin. "There are also videos of Daisy and I talking about the project."

The pair have labelled the first 100 trees using the same system used by the UK's Kew Gardens arboretum, and intend to continue with that over time, says Cliffin. "We felt that doing the top 100 most interesting or relevant trees and putting them onto a self-guided walk route would be effective to start with. We've just completed an update to the self-guided walk map on the website, to locate the trees by a number and say what its botanical name is.

"The label on the tree also has a QR code, and you can use your smart phone to link to the website and find out about the trees as you go. For example, we have a rare Japanese tan oak and the biggest Jacaranda tree in Auckland on campus and the map lets you know how to find them."

The creation of the arboretum is part of the Landscape Architecture department's research

What is an Arboretum?

An Arboretum is a living collection of plants and trees that can be used for scientific research and education, as well as to conserve and beautify an area. One of the main roles of an arboretum is to display a botanically significant collection with a variety of high quality examples to the wider public, including samples that can be used as prototypes for other gardens and plantings. They can be a stand-alone entity, or part of a botanic garden.

"A database of trees would help the Auckland Council with developing policy around utilising the urban forest to mitigate the effects of climate change."

The History of Unitec through our trees

According to Cliffin, the trees around the campus are not only a record of the natural environment; they provide evidence of the human history of the area, too. "The four distinct land uses of the campus can be experienced through the plantings of each era, from the early Māori settlers and the European farming communities through to the psychiatric hospital and the land's use as an education institution," she says. "The layers of history come alive through the knowledge of the different types of trees and shrubs present on campus – a kind of outdoor museum of trees."

The first era is the Māori inhabitation. "I think the water is the most significant link back to that era, because the waka would have come up Oakley creek before Great North Road went across there, and a dam was put in. They also probably cultivated vegetables on the good volcanic soil parts of the campus."

The next time period was the farming era. "The farming period was very short, probably only about 30-50 years. There would have been clearing of the land, and planting of shelter belts. The trees in the Oakley creek dip would also have been planted for protection against the south westerly winds. The dry stone walls are also from the farming times. There's a really nice stacked dry wall down by the wetlands, between The Hub and the gym."

Then there is era of the psychiatric hospital. "Some of the things we know about that time are that the buildings were designed to have broad outlooks to calm the minds of patients. The idea of 'airing courts' has also been written up. They thought the smell of conifers was almost disinfecting of the bad things in people's minds, so they planted those around the buildings. Gardening was seen as therapeutic for patients. Vegetables were grown down in the area still used for productive community gardens, and there was a large orchard."

The final period is the use of the area as an educational institution, up to present day. "The Ring Road avenue was planted in the early '90s, and there were new plantings and several new buildings at that time. Isthmus Group Architects won an award for the creation of the wetland in the mid-90s, which was designed as a natural feature to take the run-off that was part of the new carpark at Gate 4. The creation of areas like the Suffrage Gardens, and new plantings around newer Unitec buildings such as the sports centre are all indicators of the latest era of trees at Unitec."

strategy, and incorporates the department's research aims for the greater Auckland region, says Cliffin. "The Arboretum is useful for the analysis and planning aspect of landscape architecture. It allows us to work on projects like the regional planning of green infrastructure and environmental resources, as well as the concept of an urban forest. Our goal is for Auckland to be our laboratory in which to test those theories. The Unitec Arboretum is the first step towards doing that on a larger scale."

The next goal, says Cliffin, is to establish a wider Auckland database. "I have developed a lot of knowledge and skills while working on the Unitec pilot scheme and the next stage is to expand the model for the whole of Auckland. I've been writing a proposal for Auckland Council, and I've been to visit a couple of the local boards to talk about the project."

A database of trees would help the Auckland Council with developing policy around utilising the urban forest to mitigate the effects of climate change, says Cliffin. "Carbon sequestration – which is when trees absorb carbon dioxide, then turn it into carbohydrates in their structure, so it's no longer in the air – obviously provides a mitigation effect against greenhouse gases being released into the atmosphere.

"So the more trees we have, the better. There's lots of research about how much, and how it varies across climates, and across forest types. There's also research on water absorption, soil stabilisation, storm protection and temperature reduction. If they know how many trees they have and can measure the benefits, the council can more effectively plan the future of Auckland's urban forest."

Cliffin has found examples of other tree databases used by cities around the world: one she's particularly excited about is San Franscisco's Urban Forest Map. "It's a live open-sourced mapping programme, which generates eco-data, or sustainability data, from what's been entered into the mapping system, including information added by local citizens about the trees in their gardens.

"So from the types and numbers of trees logged into the program, the system adds up all the carbon sequestration that the forest is doing, and all the water absorption, for example, and then provides data the council can use to quantify the benefits. It's fantastic for councils because they can say, 'This is what our urban forest is generating', and then use that for future planning."

» contact

Penny Cliffin
Senior Lecturer
Department of Landscape Architecture
pcliffin@unitec.ac.nz

Botanical name: Ginkgo biloba

Common name: ginkgo, maidenhair tree

Family: Ginkgoaceae

Native to China, the ginkgo has distinctive fan-shaped leaves that turn a golden colour in autumn. It's considered a living fossil, recognisably similar to fossils dating back over 270 million years. Because it's a hardy tree, resistant to disease, insects and pollution, some specimens are claimed to be more than 2,500 years old. The female trees produce fruit-like seeds that smell like vomit once they have fallen, so the male trees are most often cultivated. The seeds are a traditional Chinese food, and are also believed to have health benefits including brain function and memory enhancement. We have examples of both male and female ginkgo trees around building 48.

Botanical name: Castinopsis cuspidata

Common name: Japanese tan oak

Family: Fagaceae

Originally from Japan, the Japanese tan oak is rare in New Zealand. It is a medium-sized evergreen tree, and a relative of oak. Its deadwood is host to many mushroom types, including the shiitake. Their flowers are unisexual, and individual flowers are either male or female, but both sexes can be found on the same tree. It grows in woods and ravines, especially near the sea. The nut is eaten boiled or roasted. There is a large Japanese tan oak on the western side of building 48.

Botanical name: Jacaranda mimosifolia

Common name: jacaranda

Family: Bignoniaceae

The Mt Albert campus boasts the largest jacaranda in Auckland, and provides stunning purple flowers in summer, so it's well worth a visit to the campus to view on the lawn in front of building 48. The jacaranda is native to Brazil, and its name is believed to be of Guarani in origin, meaning fragrant. Jacaranda are common in some areas of Australia and South Africa, and it's said that students in both countries believe that to have a jacaranda flower fall on them is good luck for their exams. It's also sometimes known as the Tree of Knowledge and Wisdom, so it's the perfect tree for our campus!

For more on each of these trees and to find their location on campus go to the arboretum website: www.unitec.ac.nz/trees/

Winning ways

Joanne Drayton's biography, The Search for Anne Perry*, was recently a finalist in the prestigious New Zealand Post Book Awards.*

When this year's finalists in the New Zealand Post Book Awards were announced, Associate Professor Joanne Drayton said she didn't believe it at first. "I was in the UK to present a paper at a conference in Oxford. I checked my emails, and there was an email from the PR person at Harper Collins, and it said 'You will probably know what this is about'. And I thought, 'I've been sued'. I thought something terrible had happened."

Even when Drayton opened the attachment, it didn't immediately set in. "I double clicked on it, and it was a confidentiality agreement. I saw the New Zealand Post Book Awards logo at the top and I still didn't realise what it was about. I rang my partner in New Zealand, and said I'm going to send you an email. So I had to send it to New Zealand to get it confirmed."

photos: Grant Southam

But it was a rush to get that kind of appreciation for her novel, she says. "It's such a huge amount of work, and sometimes you think to yourself, 'Was it all worth it?' But then you get something like this. I just couldn't believe it; I didn't expect to be a finalist."

Drayton's book, one of four finalists in the non-fiction section, is about the life of successful crime novelist Anne Perry, known to many New Zealanders as Juliet Hulme, one half of the teenage duo who murdered Christchurch housewife Honorah Parker in the 1950s. Perry was outed as Hulme in 1994 when Peter Jackson's movie about the murders, *Heavenly Creatures*, came out and a journalist tracked her down.

Drayton says she was extremely happy to be one of just four finalists in the awards. "I felt the victory was in being a finalist. I think to be a finalist is to have that viewpoint accepted as part of the New Zealand cannon, and that was enough for me."

The book still has deals being made around its publication internationally, with a paperback version poised to be released in Canada, a potential deal with Harper 360 for worldwide rights in discussion, and an American publisher talking with her publishers. "You just never know with publishing, it's a very uncertain business at the moment. But the book has done really well, actually, and my publishers obviously think that it has the potential to do more."

Even more thrilling, says Drayton, is the news that she has just signed a contract with South Pacific Pictures to option the film rights. "I turned them down initially, because I thought it was going to be another exploitation of one of my books. I've done two documentary films, with two different directors, and I ended up out of pocket both times. When South Pacific Pictures came to me, I thought 'No, I don't want to do that again.' But Harper Collins said to me, 'I think this is a bit more serious than that.'"

Despite the contract being signed, she's quick to point out that the rights being optioned doesn't always mean a film is made. "You've got to remember that 80 per cent of film options don't get out of the drawer once they get done. But this has taken them a year to negotiate, so I'm hopeful. It's down on the contract as a documentary, but I don't know specifically what form a film might take at this stage."

Drayton says she is grateful to the environment provided by Unitec for her own work, and the work of others around her. "Unitec and other polytechnics have supported some of the most important voices from a more peripheral position. I think people from the periphery of academia often feel less of an obligation to go with the company line – the assumptions and mores and values of their time – and I think you get a clearer and more honest voice.

"Unitec has been one of the key providers of an alternative and distinctive voice that sits outside the ivory tower of academia and offers a more incisive and honest view of New Zealand. It has created an environment of intellectual challenge and vibrancy, a kind of agility and stealth that comes from not being too comfortable."

» contact

Joanne Drayton
Associate Professor
Department of Design and Visual Arts
jdrayton@unitec.ac.nz

» contact

James Stewart
Senior Lecturer
Department of
Accounting and Finance
jstewart@unitec.ac.nz

photos: James Ensing- Trussell

Fishing for answers

Assessing how the fishing quota system is used by the commercial fishers it affects has been the focus of recent research by Accounting and Finance Senior Lecturer James Stewart.

New Zealand has one of the largest Exclusive Economic Zones (EEZ) in the world, stretching 220 nautical miles (roughly 370 km) around our coastline, and spanning well over four million km^2 of sea. It's no wonder that we have one of the most complicated and efficient quota management systems (QMS) in the world.

The QMS, which was introduced in 1986 after concerns about the depletion of New Zealand's fishing stock, has had much international attention thanks to its reach: around 100 species out of 130 are currently managed within the 10 Fisheries Management Areas (FMAs). "New Zealand's QMS is one of the best examples in the world of a system that is pervasive through a fishery," says Accounting and Finance Senior Lecturer James Stewart.

Stewart has been researching in the area of New Zealand's fisheries for the last ten years, and his latest project is for a report requested by the Ministry for Primary Industries (MPI) on how sections of the QMS are operating, particularly the Annual Catch Entitlement (ACE).

Each year, MPI determines a Total Allowable Commercial Catch (TACC) for each fish species in the QMS, and then uses those numbers to determine the ACE for each quota share owned by fishers. The ACE is integral to the QMS, as it tells fishers specifically how much they are allowed to catch per year.

Stewart's research is in collaboration with fellow Unitec researcher Associate Professor Jonathan Leaver, and is focused in two main areas. "It was firstly looking at the information channels in the ACE market," he says. "How well the market works, how well information flows, if information is accessible to everyone. Basically, whether the ACE market operates efficiently."

He attended the annual conference of the New Zealand Federation of Commercial Fishermen in May, where he asked fishers to do a survey on their participation in the ACE system. "We also asked them to comment on the main issues they had with the ACE system, and their suggestions for correcting those."

The second part of the research was more complicated, and involves an arbitrage system that has emerged between fishers who are over-caught on their ACE allowances. "If you catch more fish than you have ACE for then you have to pay a penalty fee, which is called a 'deemed value'," says Stewart. "The deemed value is a tax or levy and it is paid per kilogram on a catch over your ACE. It's proportional, so the higher over your ACE that you go, the higher the deemed value goes too."

The proportional nature of the penalty fee means that those fishers who are heavily over-caught are able to trade ACE with those who are less overcaught, thereby reducing the overall amount of deemed value required to be paid.

This information on the ACE trading is publicly available data, says Stewart. "We looked at the records of ACE trades, ACE balances and catch transactions for our research."

The report is due to MPI by the end of the year, and more information will be available next year.

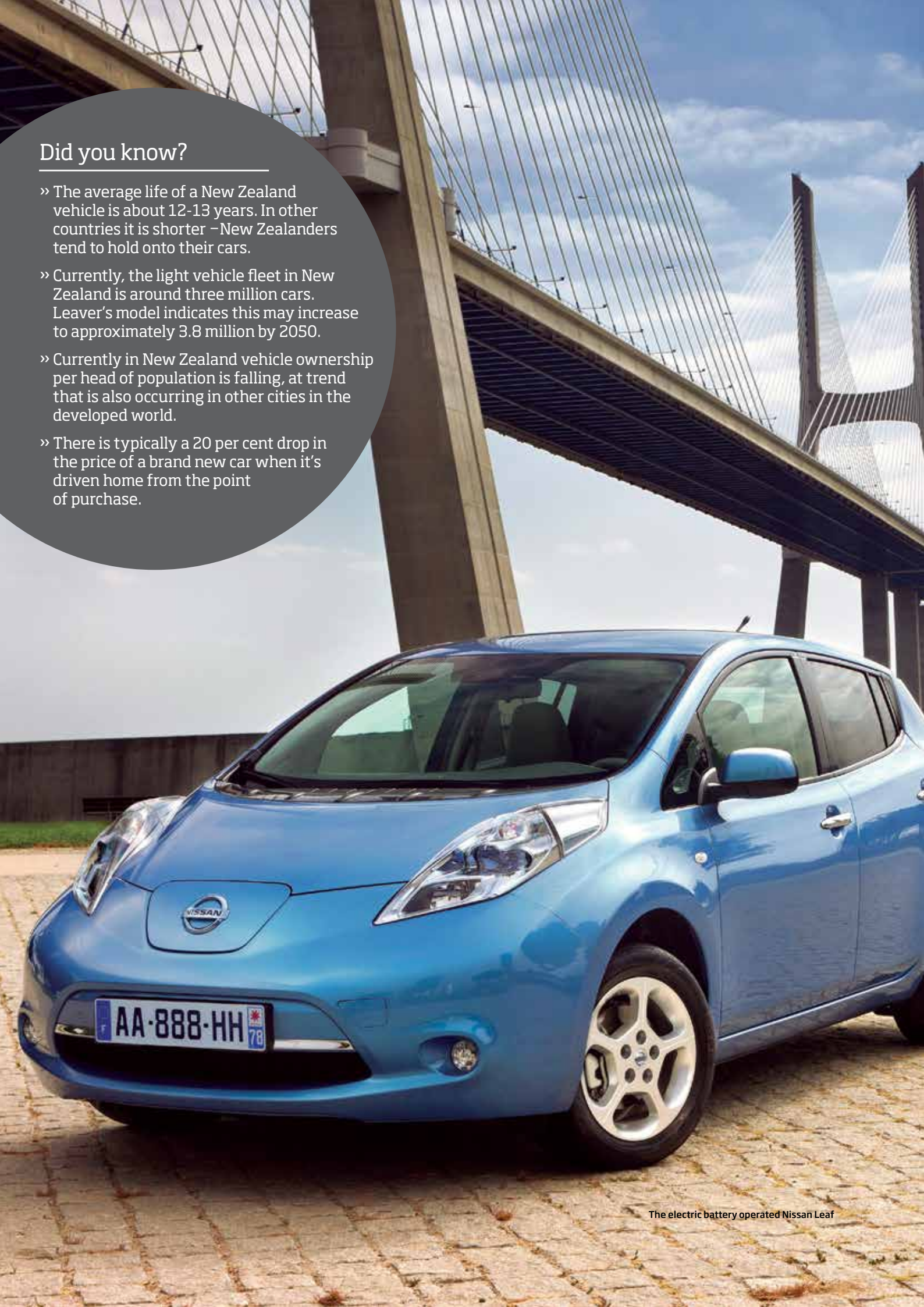
Did you know?

» The average life of a New Zealand vehicle is about 12-13 years. In other countries it is shorter – New Zealanders tend to hold onto their cars.

» Currently, the light vehicle fleet in New Zealand is around three million cars. Leaver's model indicates this may increase to approximately 3.8 million by 2050.

» Currently in New Zealand vehicle ownership per head of population is falling, at trend that is also occurring in other cities in the developed world.

» There is typically a 20 per cent drop in the price of a brand new car when it's driven home from the point of purchase.



The electric battery operated Nissan Leaf

Predicting the future of our roads

Civil Engineering Associate Professor Jonathan Leaver has a model that can assess the potential future of New Zealand's energy economy out to 2050.

What kind of car will you be driving in 2050? According to Civil Engineering Associate Professor Jonathan Leaver, there's a high chance it will be a hybrid car like the current Toyota Prius, and a smaller chance it will be an electric battery-operated vehicle like the Nissan Leaf or even a hydrogen fuel cell powered car like the recently released Hyundai iX35.

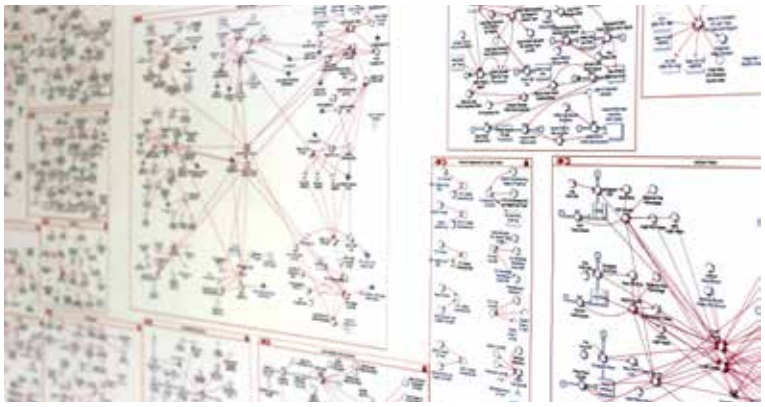
How does he know all this? Leaver, with assistance from three Stanford University interns, has spent the last ten years designing a complex model that takes the whole of New Zealand's energy economy into account – what it looks like now, and what it will look like in the future. "What we have done is create what other experts believe to be a very robust model to look at our energy economy and assess what alternative technologies might be on the road in 2050," he says.

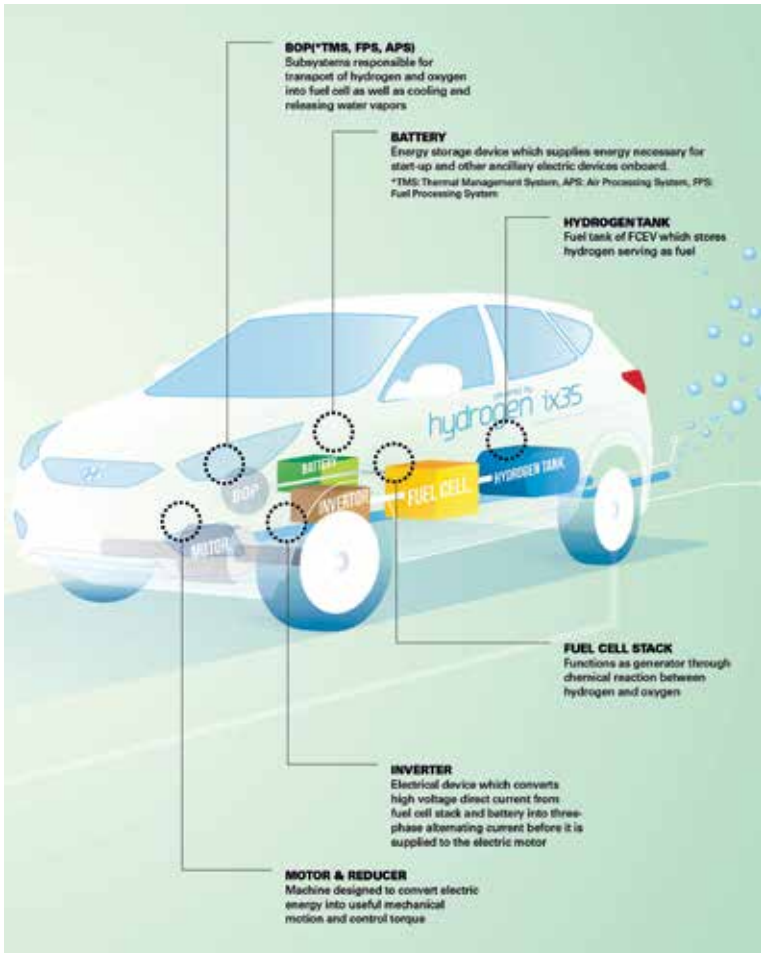
On the wall of his office at Unitec, Leaver has a huge printout of the model, a complex array of red lines, squares and circles, measuring the connection between the multitudes of variables. It's not a simple model by any stretch of the imagination. It includes around 5,500 lines of computer code and around 1200 variables, each of which has an algorithm or a formula assigned to it. "Each of the circles on the diagram is a variable, and the lines are lines of dependence to other variables. It's a little bit like a genealogy chart where you are looking at your family tree."

He first began working on the model, called UniSyD, in 2002 when he was contracted to do a project on the potential for hydrogen fuel cell vehicles in New Zealand. It didn't take long for Leaver to realise he couldn't look at hydrogen in isolation. "A student at Unitec had done a very basic model of New Zealand's electricity system, using a particular type of software called system dynamics, in which the computer variables are represented in the form of networks. It's visually quite simple to understand, so I decided that was the way to go for this project."

UniSyD divides New Zealand up into 13 regions and aims to meet New Zealand's energy needs by placing electricity generating stations, and other forms of energy generation such as hydrogen, in those regions where the model believes they are most viable. Then it uses a range of variables to assess the situation. "Hydrogen has become just one of many factors that the model is capable of considering," says Leaver. "For instance, it now includes water and air pollution costs, the New Zealand vehicle market, and the electricity market. It looks at all New Zealand's primary energy resources – including renewables such as hydro, wind, solar, biomass and geothermal, as well as non-renewables like coal and natural gas. It assesses how much energy is available, at what cost, to a nominal horizon of 2050. Every single variable has a formula or algorithm attached to it."

The model even includes less tangible variables. "It has a strong focus on modelling human behaviour, because that has such a strong influence on the composition of the vehicle fleet," says Leaver. "There have been studies done on how people react when they go into a car yard to buy a car. They don't think like economists; they don't look at the life of a vehicle and say 'What's the least net present value for me and my family?' People tend to





Top to bottom: Inside the Hyundai ix35. The UniSyD model on Leaver's wall. Features of the ix35.

The future according to UniSyD

- Most of the vehicle fleet will have the capability to run at least a small distance on a battery by 2050. So most cars will have, in some form, the capability of the Toyota Prius Hybrid – which can currently run for up to six kilometres on battery before switching to petrol.
- Many of the vehicles may well be diesel in 2050, because the diesel cycle is more fuel efficient.
- There will be a reduction in our fuel use because vehicles will become more fuel efficient and a proportion of their travel will be on batteries. However, it probably won't be to the extent that a lot of people would hope.
- The light vehicle transport fleet will continue to be dominated by internal combustion engine vehicles and hybrid vehicles like the Toyota Prius, with those vehicles forecast to comprise between 75 per cent and 84 per cent of vehicles by 2050.
- Hydrogen-powered fuel cell vehicles could contribute as much as 22 per cent in 2050, but that is under the particular provision that there is cheap production of hydrogen. If hydrogen has to come from fossil fuels, this scenario becomes unlikely.
- Biofuel vehicles aren't likely to constitute more than five to eight per cent, due to limitations on New Zealand's ability to produce cheap bioethanol and biodiesel in the volumes required.
- Pure battery electric vehicles are likely to be only between one to two per cent if they have a range of over 150kms, but they have the potential to rise to as much as seven per cent under particular types of market situations.
- The other significant factor is greenhouse gas emissions: there are a range of scenarios in which these could potentially reduce by up to 35 per cent by 2050. For example, through banning production from fossil fuels.
- However, greenhouse gas emissions could also increase by up to 17 per cent if you allowed for bulk production of hydrogen from the gasification of coal.
- Overall, New Zealand's renewable electricity generation will increase from 77 per cent in 2011, to a maximum of 92 per cent in 2050, depending on fossil fuel prices, carbon tax and government policy.

think in quite short time frames; three to five years. So if the car is more expensive but has savings in fuel costs, people want savings within three to five years."

Incorporating this data on behaviour enables UniSyD to make assessments on what vehicles people will purchase in the future. "For example, the short-term three-to-five-year thinking is a big disadvantage for electric vehicles," says Leaver. "That's been reflected in the prices for early second-hand electric vehicles. The Nissan Leaf purchased brand new is around NZD$69,000. But recently a one-year-old Nissan Leaf was auctioned and sold for around NZD$36,000. So there's a big difference between what the market is offering and what the average New Zealander is prepared to pay."

Having the right data is integral to the success of the model, says Leaver. "We've searched global literature; we've gone to government agencies such as the US Department of Energy, the US National Energy Laboratories, and the Department of Trade and Industry in the UK; and we've used refereed journal papers. If you start introducing data that is not robust then the credibility of the whole model starts to suffer. Researching the data that goes into the model would be about 20 per cent of the development time."

The UniSyD model recently came to the attention of Nordstar, a consortium of nine research institutes in Scandinavia. "They came to us out of the blue, and said 'We've searched around the world, and we think your model is what we're looking for.' We signed an agreement, and they sent a post-doctoral researcher, Dr Ehsan Shafiei, from the University of Iceland to work with me for two and a half months to learn about the model."

Nordstar has European funding to do an evaluation of the future energy direction in Scandinavia, and plans to use the model to help with this analysis. Shafiei has adapted the model for Iceland – which has a less complicated energy economy than other Scandinavian nations, and a population of only 150,000 people – and he's now looking to extend that into other parts of Scandinavia.

"There were several reasons we went with the UniSyD model," says Shafiei. "It's an up-to-date and innovative model that focuses on the energy supply sector with a detailed resource and technological specificity; the scope of the model covers a wide range of energy systems and interactions across the key energy markets; it highlights the transport sector and endogenous representation of transport fuel demand and greenhouse gas emissions; it was multiregional in its capability; and we felt there were strong similarities between Iceland's and New Zealand's energy systems."

Shafiei says the results from the Iceland version of the model are almost ready and they're currently checking, processing and analysing the results. "Switching the model to Iceland's case study has been a really smooth process because the original model was so well-documented," he says. "I have been very much supported scientifically by both Unitec and Iceland University."

According to Leaver the testing of the model at the University of Iceland is very valuable. "They've been working on it for a year, and they've already done a lot of robust testing," he says. "Until recently, Iceland has had someone working virtually fulltime developing the Iceland version and they're able to feed back some of the research they're doing to help us improve our model. We're also very pleased that Dr Shafiei is shortly heading to the US to work with leading systems dynamics experts at MIT and North Eastern University. This will enable us to incorporate some of their ideas into our model."

Other collaborations are on the horizon as well, including an agreement with Kanagawa University in Japan. "The model is going to be trialled on one of the 47 prefectures in Japan. There is also some interest from organisations within New Zealand who want more information on the potential of hydrogen fuel cell technology. We would definitely like to collaborate with more partners to see the model develop. But at the moment, it's very exciting to be working with the University of Iceland and Kanagawa University. It's got a second breath of fresh air, and we'll be able to take the model to the next level."

Leaver says the UniSyD model will continue to be updated with improvements as they appear. "For example, the model still needs the addition of other vehicle fleet types. It doesn't currently include diesel light vehicles, which we'd like to add to the model in the next 12 months."

As for the original research, the report for Callaghan Innovation and CRL Energy was able to make some useful conclusions on New Zealand's energy economy out to 2050. "To sum it up, unless there is government intervention to subsidise the capital cost of electric vehicles, then the proportion of electric vehicles in 2050 will probably be less than 15 per cent, and could well be less than 10 per cent," says Leaver. "Hydrogen powered cars will likely be an even smaller percentage. Fiscally neutral changes in government policy will be needed to avoid the vast majority of the vehicle fleet continuing to be powered by fossil fuels out to 2050."

"We would definitely like to collaborate with more partners to see the model develop. But at the moment, it's very exciting to be working with the University of Iceland and Kanagawa University."

» contact

Jonathan Leaver
Associate Professor
Department of Civil Engineering
jleaver@unitec.ac.nz

SUGGESTED ADDITIONAL WARD FOR MENTAL HOSPITAL, at the corner of Woodward Street and Gladstone Road. Ratepayers have protested to the Mount Albert Borough Council against the extension of the Mental Hospital in this district.

Resident managers at Penman House — Mr Ron Auty and his wife Helen.

Penman House — an old and gracious home.

Clockwise from top left: The house in an Auckland Star article from 1930. Mr and Mrs Auty from an article in the Central Leader in 1973. The house in 1973 from the same article, with the lower balcony covered in.

HISTORY

A new life for Penman House

The Unitec Research Office and Postgraduate Centre recently moved into Penman House on Carrington Road, a building with a long and interesting history.

Penman House, located just off the corner of Woodward and Carrington Roads in Mt Albert, and right next to Unitec's gate four, was built in the early 1900s - largely by staff and patients from what was then known as the Avondale Mental Asylum, and previously the Whau Lunatic Asylum.

First used by Medical Superintendent Dr Henry Meredith Buchanan as a residence, it was decided in 1930 that with 15 rooms, the residence was too large, for that purpose. After some local community debate, it was converted into an additional neuropathic unit for female patients. The first patients were admitted between 28 August and 31 December 1931.

Between 1933 and 1937, highly regarded New Zealand journalist, novelist and poet Robin Hyde (1906-1939) voluntarily lived at 'The Lodge', as it was then named, after she attempted suicide in June that year. A collection of her poems, *Young Knowledge: The Poems of Robin Hyde*, edited by Michele Leggott, contains poems written during her time there.

According to researcher Alison Hunt's 2005 paper on Hyde, "Buchanan's handwritten notes record his positive first impressions of Hyde, impressions that I believe were a determining factor in the nature of the mental health treatment afforded to Hyde from 1933 to 1937. That treatment had a profound influence on Hyde's development as a writer."

According to Hunt, Hyde's 1934 unpublished autobiography was written at The Lodge, after being asked to write it by her primary doctor, Gilbert Tothill. She addresses Tothill throughout the document, and describes her room at the Lodge as "a pleasant, quiet room".

Hunt says The Lodge was situated around 800 metres from the main Auckland Hospital building, and was described by

photo: Sir George Grey Special Collection, Auckland Libraries, NZ map 3500


photo: Lisa Truttman


photo: Lisa Truttman

Clockwise from top left: A map of the Carrington Road area from the 1950's. Recent photos of Penman House.

Buchanan as an "attractively yet economically furnished villa" for "twenty-four patients of either the advanced convalescent type, or for the admission of early border-line cases".

Hyde referred to it as 'The Grey Lodge' in her writing, a nickname also used by the District Engineer in a letter to Buchanan prior to her instalment at The Lodge. It appears to be a name used by those familiar with the building. It also seems to have been known as Oakley Lodge at some point during this period.

Hyde lived alone in a double room in what was then the newest ward in the hospital. Her room on the first floor had two sets of windows facing north and west. It was better furnished than any of the other wards, and she retained sole use of her room until she left in 1937. She lived and worked at The Lodge, and wrote her novel, *The Godwits Fly*, as well as five other books and two collections of poetry while she was living there.

The final stanza of her "Three Poems" gives a description of her room:

I should like to die in this room –
It looks towards the West.
Outside, the great bronze sickle of the dusk
Mows the red poppies of the sunset clouds.

Robin Hyde Young Knowledge.

In the 1970s the building was leased from the Auckland Hospital Board by the Baptist City Mission and used as a 'family-type' supervised boarding house for psychiatric patients on leave. They named it after the Penmans, a prominent family in the Mt Albert area, and it has been known as Penman House ever since.

Penman House was run by Mr and Mrs Ron Auty, who, in close association with the Baptist City Mission board and social workers, were attempting to help residents adapt back into the local community. According to an Auckland Star article in 1974 they had 22 residents aged from 17 to 72, at different stages of recovery, and some with part time work. These residents paid board from their wages or their benefit, and were given help with budgeting.

Mr Auty was quoted saying the atmosphere of the house was that of a family rather than an institution. "We feel that within the total context of the family there can be healing. We see a lot of problems, but in the midst of this we can see something happening as well," he said.

Penman House has been part of Unitec since 1992, when all the adjacent hospital land and buildings were purchased by what was then known as Carrington Polytechnic. Until recently, the building housed the Unitec Facilities Management department, and since July 2013 Penman House has been the home to the Research Office and Postgraduate Centre at Unitec.

The purpose of the Research Office and Postgraduate Centre is to support staff and student research by providing research management services such as strategic research funding, ethical review, grants and funding, and student thesis examination. The centre also provides facilities for postgraduate students including study spaces and a computer lab.

Dean of Research Simon Peel says it's a great new home for his department. "It's a beautiful old building with an interesting history. We're very happy to be here, and we look forward to working and meeting with others in this new environment."

photo: Jae Frew

Alex Williams and some of his students - out of a total of 40, he has two male students.

photo: Simon Riera

2%

men teachers in ECE

15%

Unitec has around 250 students on the ECE programmes at Unitec, spread across its three-year degree and Williams says there are around five or six men on the programme

100%

In the last five to six years, the number of men in early childhood education has doubled, going from one per cent to two per cent

Where are all the men?

Anyone with young children knows that male teachers are extremely rare in early childhood education. Unitec Lecturer Alex Williams has been looking at why this gender imbalance still exists, and talked to the men brave enough to be in this minority.

The lack of men in early childhood education (ECE) was an issue Unitec ECE Lecturer Alex Williams noticed right away when he moved into the sector. "As soon as I started visiting students out in the field, for me the question was huge: 'Where are all the men?' You go into any early childhood centre and you're unlikely to see a man. For me it was profound," he says.

Williams – who was a primary school teacher before moving into tertiary teaching 12 years ago – believes research in this area needs to be highlighted. "That initial exposure to ECE and the realisation that it's a highly gendered profession where men are largely invisible was what originally sparked my interest," he says. "But I also wanted to start a process of reframing early childhood education as a positive, meaningful, enjoyable and socially significant career for men."

"Society just doesn't see working with young children as something that men do."

According to Williams, there are three commonly perceived reasons why there are very few men in early childhood. The first and second are the low pay rates, and the low status of the work; both of these are understood to be associated with ECE being seen as a woman's area of work, which is traditionally undervalued. The third reason is the possibility of male ECE workers being accused of child abuse, as in the Peter Ellis case in the '90s.

But Williams doesn't believe these three reasons account for the overwhelming lack of men in ECE. "Early childhood education isn't that badly paid anymore, and we can come up with examples of low paid work that men are happy to do. Also, there are many examples where men are quite happy to do low-status work, although it is important that their sense of masculinity remains intact.

"The potential to be accused of doing something inappropriate is very real, and any man working in an early childhood environment will be aware of that reality, but these days early childhood education centres are designed so carefully, they're wonderfully safe environments.

"Statistically, child abuse doesn't happen in early childhood centres, it happens in the home, by people children know and trust. Added to that, men are quite comfortable working with children in other contexts, such as coaching young children's sports teams, and working with scouts and cubs."

Williams says the main reason behind the lack of men in ECE is our traditional stereotypes of what men and women are supposed to do for work. "Ultimately it's an issue about gender stereotyping and traditional gender roles. When we look more deeply at the way society has framed up and perpetuated gender stereotypes around what men and women do, we start to get at the heart of the problem," he says. "Society just doesn't see working with young children as something that men do. It's been framed up as a woman's activity, an extension of mothering, a nurturing and caring role and that's something we don't see as synonymous with what men do. This needs to change."

Once we understand the lack of men in ECE as a sociological issue, Williams says we can work on shifting that imbalance. "It's an issue related to the way we have limited people's choices based on gender. We understand that such limitations are unhelpful, and in many contexts society has worked hard to challenge those limitations. In professions like nursing, flight attending, caring for the elderly, we see more men represented

in those areas than there used to be. It's just that early childhood has been one area that has been really slow to see a positive step forwards in this regard."

While things are changing – the number of men in ECE has doubled from one per cent to two per cent in the last few years – it's not changing fast enough for Williams. "Everybody acknowledges that education is a socially significant, important aspect of our society, and to have such a socially significant activity exclude, through no act of its own, half the population, is incredible. Imagine if we only had male doctors, if 98 per cent of doctors were all men? We're looking at a situation that reflects social beliefs from 50 years ago. These are redundant, unhelpful, restrictive stereotypes about what men and women do, and I find it disturbing."

In an effort to help readjust this imbalance, for his most recent research project Williams decided to talk to the men who are already working in ECE in New Zealand, who are already breaking those traditional social and gender expectations. "There's not a lot written about the lack of men in ECE, and what there is tends to focus on why there are no men: that is, what's the problem? I felt that to understand the situation better, we needed to hear the voices of the men who are already working in ECE; to understand what encouraged them into this sector, and what it is about early childhood that these men like, what interests them."

"These are redundant, unhelpful, restrictive stereotypes about what women and men do, and I find it disturbing."

Williams was able to secure a grant from the Unitec Faculty of Social and Health Sciences to facilitate his research, particularly the intensive interviewing process. "I found 10 men currently working in early childhood. They ranged in age from early twenties through to 62 years of age, and they ranged in experience from two years' ECE experience, to 30-something years of experience, so I had a wide range of representation. I would meet with them in their work context and I interviewed them in a semi-structured way; I had questions I wanted to pursue, but I let them take the conversation where they felt most comfortable."

Williams focused on three areas of interest: "Firstly, I wanted to find out the background of these guys, what they did before they came to early childhood. The second area was what influenced their decision to join early childhood – remembering that these are not flippant decisions; it's a change in career that was underpinned by the need to gain the necessary qualifications. The third area was their experiences within early childhood, particularly the parts they found most rewarding. The focus was on the positive aspects, because I believe we desperately need to reframe early childhood as a positive, meaningful vocation for men."

The research emerged with some very clear themes across the experiences of all the men, says Williams. "The first thing that was interesting – and very profound– was that none of the men had entered early childhood as a first career. They all had experiences in other careers. They seemed to need some kind of hiatus in their life, or some kind of opportunity to review where they were going with their career.

"For some of them it was possibly a negative thing that occurred. I guess that talks to the reality that most men don't initially see early childhood as a career destination. They'd had businesses, driven trucks, been plumbers, done a number of different things, and through various situations in their lives had been provided with opportunities to review and re-evaluate their careers."

Often a key factor was being able to spend more time in an early childhood centre with their own children. "It involved positive contact with time; time to sit down and read a book, play in the sandpit, or do a puzzle, rather than the stress of having to drop their kids off in ten minutes to get to work on time. It's a big difference."

Having the extra time to spend with the children widened the perspectives of these men, and made them realise that they wanted to spend more time in that environment, says Williams. "A man might say to himself, 'I'm convalescing, and I've got the whole day in front of me, and I'm going to spend a couple of hours in the sandpit with my kids.' Suddenly they find the sandpit is a vibrant, happening place. In fact, the sand pit goes off; there's a lot of learning happening in the sandpit."

The second theme that Williams found among his research subjects was that they had a shared desire to be involved in something socially significant. "They wanted to do something that was important, and to make a contribution to society," says Williams. "The guys articulated that they were interested in doing something important, rather than just earning a living. That

photo: Jae Frew

Alex Williams talks to his two male students, Stephen Horne and Kiran Pollock.

altruistic sentiment was a commonality that existed across all of the guys I interviewed. They all believed they did meaningful jobs."

The last theme to come out from the study didn't initially make sense to Williams. "It was really odd; I struggled with it for a little while, and I didn't know why," he says. "The men said they wanted to do a job that was fun. They perceived early childhood education to be something that was enjoyable and fun, and initially I kind of saw that as a frivolous thing. But as I thought about it more, and I read around theories of play and learning, I realised that children learn within a fun context. Playing and learning are closely related to each other, and playing provides a meaningful context for children to learn."

Williams believes that by saying these environments were fun, the men were acknowledging that they were positive places in which learning was couched in a fun way. "I think that's something we lose as we move through the education system. When my children transitioned from early childhood education to primary school education, the 'fun' word slipped off the radar quite quickly. In ECE, the idea of fun and play are of significance within the learning context and have meaning and value beyond a pastime. Not all learning is fun, but if fun and play are given as much value as numeracy and literacy, it can help with their overall learning. We know from our own experiences in lectures and workshops that if we're enjoying ourselves, and if we feel that enjoying and being active in the learning process is valued, we're more likely to engage."

The research has shown some clear results about why these men chose to work in ECE, and Williams believes it's important information for the future. "In the last five-odd years there has been a much greater recognition from the early childhood sector itself, from our politicians, from the Ministry of Education and other interested parties, that the lack of men in ECE actually is an issue. And that it's an issue that won't change if we don't address it. What I wanted to do is provide some data so that if there is a recruiting campaign, it's well targeted. What we want to do is talk about why the men are there, and what they like about it. That's what this research was about."

And Williams says he has nothing but admiration for these men who have chosen to go against gender stereotypes. "We need to celebrate and acknowledge the brave men who are already working in early childhood education as social leaders. They are the guys that are actively challenging archaic stereotypes about what men and women do, and need to be acknowledged as such. They are the Kate Sheppards of our generation, but we don't see it.

"These men are consciously entering a profession dominated by women but still seeking to retain their masculinity. These men are modelling to young children, parents and wider society on a daily basis that men do nurture and care. Such modelling is at the heart of significant social change and we need to recognise and value it. They're seeking to be acknowledged as men, but doing a career that has been synonymous with women."

» contact

Alex Williams
Lecturer
Department of Education
awilliams@unitec.ac.nz

For the love of sport

A love of sport and a keen intelligence has led Associate Professor Lesley Ferkins into a career researching the governing boards of sporting organisations.

Associate Professor Lesley Ferkins on the slopes in Canada. Sport has been a big influencer in both Ferkins' professional and private life.

Returning to Unitec this year after a break of a few years was an easy decision for the Department of Sport's newest staff member, Associate Professor Lesley Ferkins. "I love the commitment to the students here at Unitec, and we do research in a different way here as well," she says. "It's about doing research that's meaningful, that will help people, and that's applied. It's research with a purpose, and I think that's great. Universities can be such an individualistic environment; people are pursuing their own ideas, whereas Unitec has a more collaborative approach to learning that places emphasis on the students."

Her own academic career began with an English Literature degree in the US, while on a tennis scholarship. After completing her degree, Ferkins returned to New Zealand to do her MA (Applied) in Recreation and Leisure Studies at Victoria University. "It was the only Masters in New Zealand at the time that had any relationship to sport. Basically I geared it to sport management," she says.

After finishing her degree she worked for sporting organisations such as the Hillary Commission, New Zealand Recreation Association, and Netball North Harbour. Ferkins then took on some casual marking work at Massey University. "I always swore I would never be a teacher because everyone in my family is a teacher. My parents, my siblings, and my grandparents, they're all teachers. And then I was rubbing the white board at Massey one day, and I realised, 'I'm a teacher.'"

After working at Massey, Ferkins moved to a new role at Unitec and completed her PhD. "I did the PhD completely part-time through Deakin University in Melbourne, over five years, and it

was an amazing, magical journey. My PhD and my research career are very much founded on Unitec's philosophy of applied and meaningful research."

Her area of expertise is around the governance of sporting organisations, particularly the boards. "More specifically, my research has been around developing the strategic capability in the governance of sporting organisations. One of the conclusions of my PhD was that in dealing with the boards in charge of the future of sporting organisations, one of the things that needed development was the strategic nature of what they were doing."

Ferkins uses the action research approach she learned at Unitec in her interactions with the sporting organisations she works with. Action research is a qualitative research process that goes through a progressive cycle of problem solving. "It's a great way of enabling things to happen. There is an immediate contribution, plus there are some really good outcomes for theory because you're working in such an immersed way. In that way you make a local contribution, but then also you're so involved in the process of change, it gives you this broader insight. It's real – you're in there, boots and all, doing stuff. Then you see what happens that helps advance the thinking, and that is the theory side of it."

When she left Unitec, Ferkins worked at AUT for two years, and then Deakin University in Melbourne for another two years. "I went up to Deakin and worked with my PhD supervisor, Professor David Shilbury, who has now become my primary collaborator in my research career. He is a world-leading researcher in sport management, so it's great to have him as my wingman."

Then, last year, Ferkins and her partner took some time out, and spent a year in Canada. "I was walking down the stairs at the apartment in Port Melbourne, and I said to my partner Steven, 'We have to go live in the mountains'. Melbourne is very flat, and I was missing the mountains big time. My partner got on the internet and booked a house in a place called Revelstoke in BC, Canada, and we just did it."

During their time in Canada, Ferkins had a 0.2 role with AUT in their School of Sport and Recreation. "I taught an online postgrad leadership and management course. I would go to the café in the morning on the ski hill and do my online comments and my online teaching, and then I would jump on the gondola and ski for the rest of the day. I did that for two half ski seasons. When we came back to New Zealand this role came up at Unitec, so I chose to come back here instead. It was a deliberate choice. But I still work closely with AUT in the supervision of PhD and masters students in sport management. Unitec Department of Sport and AUT School of Sport and Recreation have an agreement that allows me to be a primary supervisor."

The academic's new role at Unitec has a strong research focus; her own research, but also encouraging research among Sport Department staff members and students, and collaborations with other departments. She's been working on several new projects, including one with Professor

Eileen Piggot-Irvine, an Adjunct Professor in the Education department at Unitec, who now lives in Canada. "It's an international research consortium that's going to be researching with Eileen on the impact of action research on leadership development. It's an exciting project, although it's still in its formative stages."

As for her own research focus on the governing boards of sporting organisations, Ferkins says that although it's a bounded focus, it's something she appreciates. "They meet monthly and they're a group of seven. They have a certain function, and there are all sorts of things that spin off from that. The idea is that if we can get them running better, and doing better, then that will be seriously influential on the way they impact the sports system, especially the national bodies. That's my strategic approach to working with that group of people; they have a very big influence."

"It's about doing research that's meaningful, that will help people, and that's applied. It's research with a purpose, and I think that's great."

SPORT

» contact

Lesley Ferkins
Associate Professor
Department of Sport
lferkins@unitec.ac.nz

What's in our air?

Department of Computing Associate Professor Paul Pang has been working in collaboration with NIWA, using his machine learning expertise to analyse their air quality data.

photo: NIWA, Dave Allen

According to the National Institute of Water and Atmospheric Research (NIWA), we spend around 80 per cent of our time indoors – recent research indicates that exposure to pollutants can be higher indoors than outdoors. Understanding which pollutants might be in the air around us, inside as much as outside our homes, is becoming increasingly important, says Computing Associate Professor Paul Pang. "Poor air quality in New Zealand is estimated to cause 1175 premature deaths, and costs over NZ$4 billion each year. It's a hot topic for a lot of people."

Pang has been working on multiple projects in association with NIWA, the crown-owned research and consulting organisation with a focus on atmospheric and water research. The relationship was established three years ago when Pang approached NIWA asking to use some of their environmental data. "In many ways it was very well timed," says Dr Ian Longley, Programme Leader for Atmospheric Environment, Health and Society at NIWA. "I was coming to the realisation, as are many people in air quality science, that the amount of data we can collect is rapidly increasing. We're entering an era of big data, and while some fields have the computing power to know what to do with that, we don't."

Traditionally, they would have relied on statistical techniques to understand their data, says Longley. "Statistics is great when there is an underlying fixed pattern. When you've discovered the pattern, you can assume that it will continue into the future endlessly. But what we're looking at is a large amount of data coming in where the patterns are continually changing, so even once you've discovered the pattern, the pattern has changed."

The next frontier for NIWA was clearly computing. "But we don't have the skills; we don't have the expertise. And then Paul walked in our door, and he said that's precisely what he does. Not only that, but the particular brand of work that Paul was talking about, machine learning, was just the kind of tool we needed."

From Pang's perspective as a computer scientist specialising in machine learning, it's all about the data. He and his team had been working on algorithms associated with his research, and needed to test them. "Computational environmental analysis is quite a hot topic in my field, and environmental science is the research direction of New Zealand," says Pang. "But you need data. We believe that if we can work with industry partners, we're applying real problem solving, which is better for us and our students. Then this system will be acknowledged by our industry partners, and they in turn will have a big contribution."

The first project was based on air quality data from a specialist machine called PACMAN, which was designed by NIWA Urban Air Quality Scientist Gustavo Olivarez. "The PACMAN is looking beyond air quality management as it is now, and to the future," says Longley. "It's a device for measuring air quality in the home. We did some controlled tests with these machines: we had an experimental house, and a student who was doing scheduled activities, such as heating oil up in a frying pan. It was all timed, so we knew when they did it."

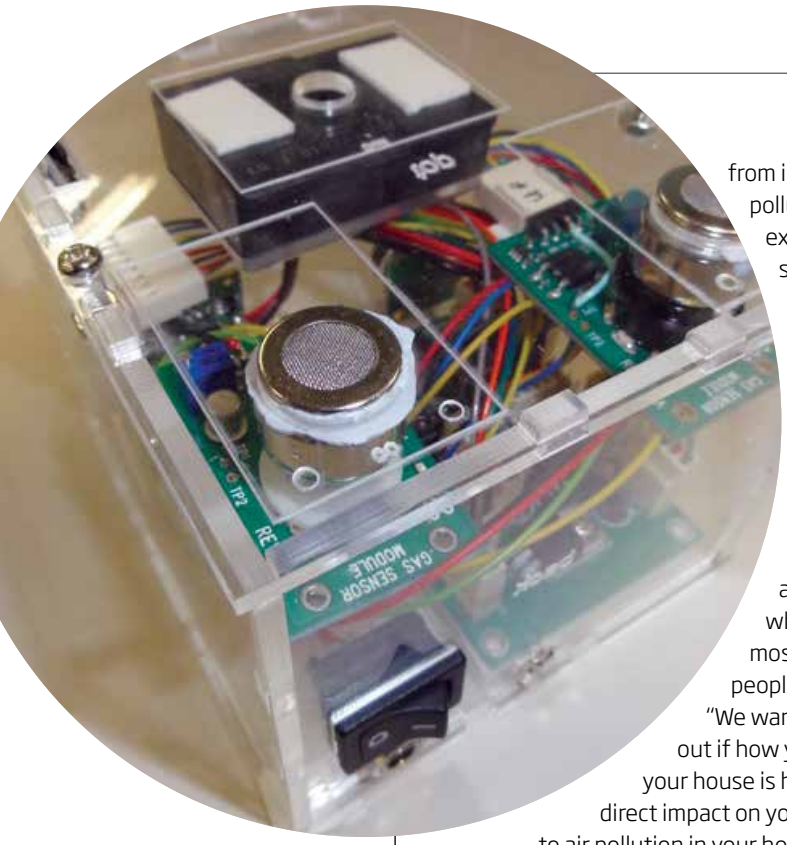
The PACMAN device was designed not only to assess levels of pollutants, but also to identify what people are doing in their houses to cause air quality problems without the use of invasive methods like video surveillance. "So it actually attempts to observe things like smoking, cooking and heating and distinguish between them. It does that by measuring multiple pollutants, and looking at the relative amounts of different pollutants produced, which gives us a fingerprint of what kind of smoke it is we're observing. It also has a motion sensor, an eye almost, which measures very fast."

These kinds of experiments are part of NIWA's research focus around the effects of air pollution on individuals, and the potential harm

Other projects with NIWA

Through the association with Longley, Pang has been able to offer his expertise to other projects within the NIWA divisions. He is doing boat-flow analysis around the harbour areas, based on camera data collected by MPI. "They want to know about the numbers of boats in and out, to help assess the total amount in terms of the fishery," says Pang.

The other project is around analysing scampi distribution. "They do surveys to find out how many burrows are made by scampi at the bottom of the sea, so they know their distribution," says Pang. "Again, we have the data in the form of cameras, and they want us to create computing methods to count the scampi burrows, which will automatically estimate the distribution of scampi."



PACMAN machine used by NIWA.

from indoor air pollution. For example, he says a lot of policy in New Zealand is focused on reducing the impact of burning wood on air quality, which is mostly done in people's homes. "We wanted to find out if how you heat your house is having a direct impact on your exposure to air pollution in your home. If your neighbour is burning wood and you're not, are you affected? Or is it your wider neighbourhood?"

The data the PACMAN machine produced created the problem the NIWA team asked Pang to solve. "The essence of the problem was that it generates an awful lot of data per second. What we needed was an algorithm to sift through that data, to do that identification process for us, because there's too much data to do it manually," says Longley.

The project started officially in February this year, when Pang's doctoral student Lei Song started analysing the data provided by Longley. "Lei's work is on incremental learning, which means we can train the machine incrementally to know what pollution is and what it isn't ; essentially what type of emission it is," says Pang. "It's a technique to train the machine to have a certain amount of intelligence, and the method can be used for problem solving."

According to Pang, the algorithm they created for the initial PACMAN data has a very high accuracy rate. "The accuracy of the algorithm is 80.14 per cent, which, compared with the other three main methods of measuring, is much higher. By that I mean it has over 80 per cent accuracy in interpreting the machine's data. The PACMAN machine itself has no intelligence to make a decision, but the algorithm developed by our group has intelligence to make a decision and interpret the results.

"Extensive testing has been done, and the results have been put into a journal submission. This is real world data, so we were very pleased with this level of accuracy."

The research is exciting for both parties, says Pang. "It's new research in terms of the data being new, and PACMAN itself being new. The incremental learning methods and algorithms that we've developed are also new, although we have been working on incremental learning systems for quite a long time," he says.

Now that the test data collected by PACMAN has been analysed, and the algorithm created, the research is going into the next phase, says Longley. "What Paul's team has shown is that they do have techniques to tackle this kind of problem. And now, the amount of that kind of data we're starting to collect is growing. We've put PACMAN machines in people's homes, as part of long-term studies looking at whether unhealthy air in your home can affect your health."

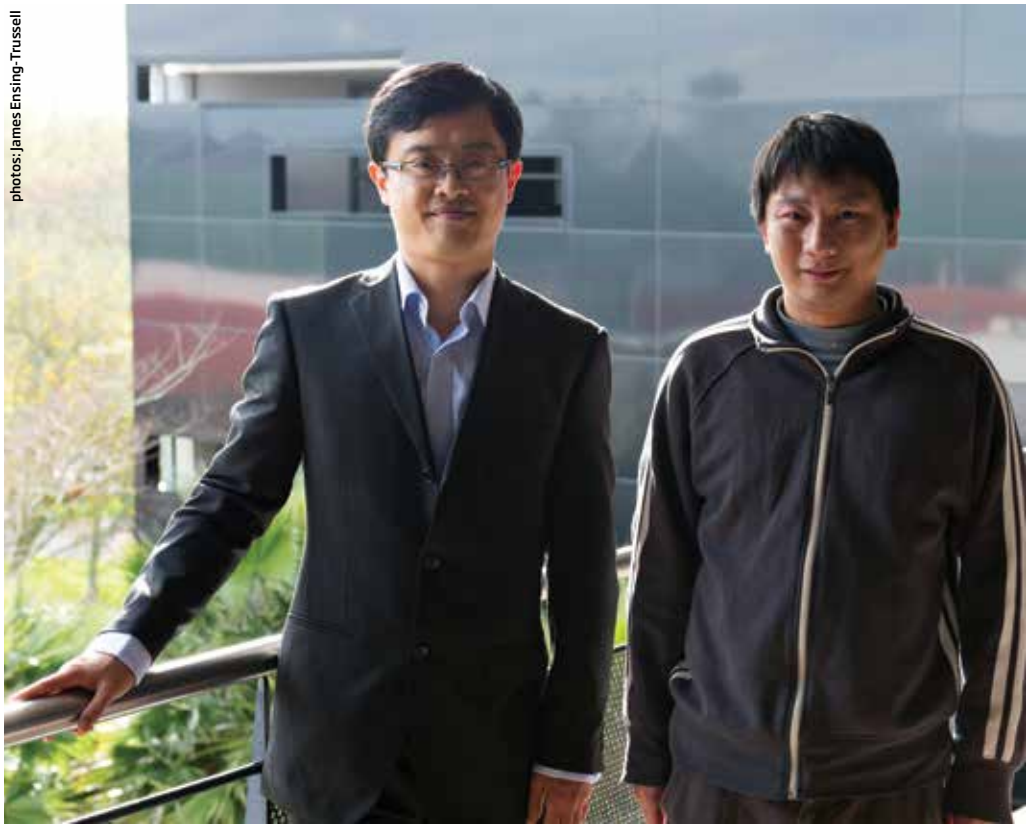
Once they'd successfully completed the first project, Longley was keen to get Paul's team working on another problem. "The second project is in many ways the simpler one, because it's a much more straightforward question. The regional councils, particularly Auckland, measure multiple pollutants at a number of sites around the region, particularly two pollutants called PM10 and PM2.5."

Particulate Matter 10, or PM10, refers to particles in the air that are smaller than 10 microns (one micron equals one thousandth of a millimetre). "They're in the air all the time; we're all breathing them in," says Longley. "But because they're smaller than 10 microns they're effectively invisible, unless you had a big thick cloud of them."

"Computational environmental analysis is quite a hot topic in my field, and environmental science is the research direction of New Zealand."

There are national standards around PM10s, so the councils are legally required to monitor PM10s and report on it, says Longley. "Internationally, there is also a standard called PM2.5, which is particulates that are smaller than 2.5 microns. So a few years ago the Auckland Regional Council started monitoring PM2.5. But it's expensive to measure both."

photos: James Ensing-Trussell



"There are many problems that have big data, for example: Is the climate changing? Is the weather changing? Are people responding to policy? "

Associate Professor Paul Pang and doctoral student Lei Song.

Because they had data with both types of PMs, the question Longley and his team posed to Pang was whether it was possible to predict levels of PM2.5 in the air, based on just the PM10 data. "We monitor PM10 nearly everywhere in New Zealand, and PM2.5 and PM10 are clearly related, so we thought it was plausible," says Longely. "Again, it was a perfect fit for Paul. It was a question we know councils and the Ministry for the Environment want an answer to, and Paul had demonstrated to us that he had the capability to do this kind of learning algorithm. I provided a sample of the data in April this year and the results so far seem promising."

Longley says it's a piece of work that feeds directly into environmental management. "There are other potential future spin-offs for this work. It allows you to make forecasts, projections, what-if scenarios, and it could be used as a policy evaluation tool. The other reason a lot of people are interested in PM2.5 is that the way we cost the health impacts of air quality is based on having PM2.5 data. If a new policy comes along, you can cost the impacts of the policy, and you can project the health benefits and savings from implementing that policy. That's the aim."

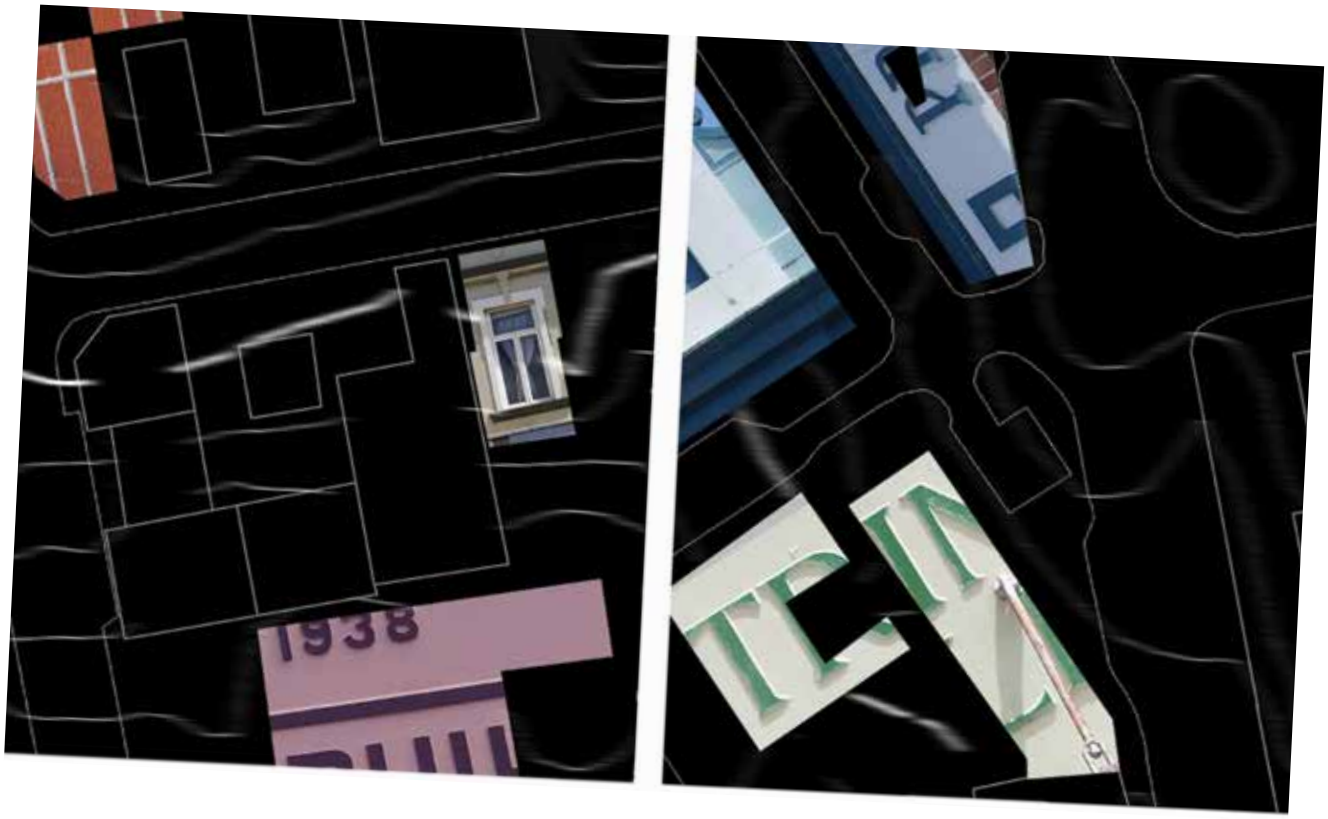
Longley says the potential to do more collaborative projects between the two teams is huge. "Right from the start, I saw there was potential for multiple projects that could tap into Paul's expertise, that would just pop up from time to time, and that's exactly what's happened. There are many problems that have big data, for example: Is the climate changing? Is the weather changing? Are people responding to policy? But if you have enough data you can tease apart these different influences."

The collaboration has been a success on both sides. "Because of the way NIWA operates and perhaps because of the way Unitec operates, we are both in a better position to collaborate than many of our international equivalents and competitors," says Longley. "For us, cracking the computing problem is the key to driving the hardware development and the policy uptake. If we can show that not only do we know what to do with the data, but we can do fantastic things that we couldn't do before, then that will attract investment to the development of the hardware."

For Pang, the relationship has been a chance to show off the capabilities of his team. "The way we convince people to work with us is that we say, 'You give us a chance to work on your problem, and we'll work out some initial results.' We've done that now, and NIWA are happy with the results of our first project. I should actually give thanks to the Unitec Research Committee, because their funding made our first project with NIWA possible. And after we'd proved ourselves Ian introduced me to other group leaders, so we now have relationships with several key personnel at NIWA."

» contact

Paul Pang
Associate Professor
Department of Computing
ppang@unitec.ac.nz



artwork: Krystina Kaza

The unstable city

Three Unitec researchers have come together on a multidisciplinary project, their aim to raise awareness of an important issue affecting cities across New Zealand.

The 2010/11 Christchurch earthquakes have had many far-reaching effects, not only for those living in the city, but for people around New Zealand. One of those repercussions has been the increased focus on the earthquake safety of buildings in towns and cities outside Christchurch, and how the various local and regional councils are dealing with this issue.

The reaction of the councils was the motivation for three Unitec lecturers to create The Unstable City Project, aimed at raising awareness of the issues around these potential new regulations. The project team, comprised of Photography and Media Arts Lecturer and Curriculum Leader Allan McDonald and Architecture Lecturers Krystina Kaza and Jeanette Budgett, says the Auckland Council's response was, in some ways, quite controversial.

"Basically, the initial impetus for the project was a concern that the Auckland Council had declared that there are an estimated 4,300 pre-1976 commercial buildings in Auckland that are earthquake prone, and they were being rather secretive about that list of buildings," says McDonald. "I was already photographing pre-1976 buildings when it was suggested that I work with Krystina and Jeanette on a wider project."

According to the project team, the situation continues to unfold, and the ability to pay for the strengthening of earthquake-prone buildings will largely determine their survival. Auckland Council is in the process of identifying buildings at risk and there are mandatory timeframes in which to get buildings strengthened. McDonald adds that the updated law is very clear – owners must fix their buildings or demolish them. "There is a very real fear, not just on our part, that this layer of architectural history is seriously under threat. If the money can't be found to secure a building, it will probably be demolished."

For building owners, this process has huge ramifications across a range of areas, from securing insurance to finding tenants, says Budgett. "It started with the question of the seismic strength of the buildings. But it's now becoming more of an economic issue; the economic and social diversity of the city potentially starts to be eroded because of this situation. Old buildings provide cheaper space, and if you knock out that economic level in the city, you get more corporate organisations in expensive buildings, so the risk is not just the loss of urban character but also an 'edgier' economic and social stratum in the city."

The team felt that the issue seemed to be flying under the radar for Aucklanders, compared with the response in other cities around New Zealand. "The implications for the townscape, and all the other flow-on effects in terms of cultural history and its preservation – particularly at a time when there's not a lot of money to reinforce and secure these buildings – is huge," says McDonald. "We felt it was an architectural, historical and cultural crisis."

Despite not knowing exactly which pre-1976 buildings might be affected by these new council regulations, McDonald has photographed buildings of the era, while Kaza has been using maps to illustrate the issue. "It was about finding a way that mine and Allan's works could talk to each other," says Kaza. "They're both photographs, just different types of photographs."

Kaza used a technique called a photogram – a process whereby several drawn layers are exposed directly onto photographic paper – to create her first map. "I had two goals, really; one was to talk about the sheer quantity of buildings that were at risk, and the other was to convey something of their character. Because many of them are old Victorian buildings, there's the potential for a lot of character to be lost."

The individual skills and interests of the three participants were used to create an exhibition that showcased the issues. "Krystina's working with maps, but she's working with mapping in a more imaginative way," says Budgett. "Allan's photographing these buildings, but he's not photographing all of them; it's not a catalogue. I'm writing about these issues, but we're not drawing conclusions, we're just trying to open the topic up."

The group's first exhibition was part of the Auckland Festival of Photography in 2012. "I was invited to participate in that festival, and I threw it open to Jeanette and Krystina," says McDonald. "That created an opportunity for Krystina's and my work to go on the wall, and Jeanette did the writing, which worked like a wall panel and provided a voice over on the video that introduced the exhibition."

Their book The Unstable City was published by Unitec's ePress at the beginning of 2013. "It's about a conversation of concern and common interest," says McDonald. "Jeanette wrote an introduction, I did one type of visual image, and Krystina did another. All those things come together and create something layered and, hopefully, substantial. We hope it will have an effect in terms of generating an awareness of this issue."

McDonald also had a presentation at the Talking Culture section of this year's Auckland Festival of Photography, and an exhibition of related material at the Anna Miles Gallery. In August the group presented a seminar on the book at the recent Auckland Art Gallery Triennial themed 'If you were to live here…' and Budgett participated in a symposium at Wellington's Adam Gallery entitled 'After the Event'.

Since their collaboration began there have been a number of policy changes around earthquake-prone buildings in New Zealand, both at a local and national level, including the announcements by Building and Construction Minister Maurice Williamson in August, after a consultation period that attracted more than 500 submissions. Changes included extensions to the timeframes that building owners have to carry out strengthening work, from 10 years to 15 years. There will also be a public register of earthquake-prone buildings through the Ministry of Business, Innovation and Employment, with the idea that central government will now have greater control in relation to earthquake-prone buildings.

Ultimately, the Unstable City Project team says they don't have answers to the on-going issues around these policy changes: their role is to encourage debate, so decisions are made via conscious choice, and not apathy. "There's all this talk about cultural production, but the three of us are also in the role of cultural conservation," says McDonald. "We're trying to preserve something, and build awareness around that.

» contact

Allan McDonald
Senior Lecturer
Department of Visual Arts and Design
amcdonald@unitec.ac.nz

photos: Grant Southam

Dealing with dilemmas

Professor Carol Cardno was at the forefront of educational leadership lecturing when the Tomorrow's Schools reforms were introduced in the early '90s. She's been helping education leaders deal with dilemmas ever since.

Educational Leadership and Management Professor Carol Cardno has been at Unitec since 1991, when she was headhunted to start up a new Centre for Educational Leadership. "In 1990 I won a Nuffield Fellowship award to the UK, to study principal development," says Cardno. "I was lucky enough to spend three months in the UK researching what they were doing over there. And while I was there I got a call from Unitec, who said: 'We're thinking of opening a centre to offer these sorts of programmes, have you ever thought of coming to tertiary?' It was absolutely, totally the unknown, but I thought, 'Why not?'"

At the time, she was Principal of Waitakere College and doing her PhD at the University of Auckland. "When I joined Unitec I was half way through my doctorate. My thesis was called Dealing with Dilemmas: a critical and collaborative approach to staff appraisal in two schools. That whole area of dealing with leadership dilemmas and building positive relationships in organisations is my major area of research."

Cardno's tertiary career grew out of the changes that school leaders were experiencing because of the 'Tomorrow's Schools' rollout in the early '90s. "Largely it was the Intermediate Schools Association of New Zealand – that was the spark for my career here at Unitec. They approached Unitec and said 'Offer us a programme, because we're going to have to become school managers now, with the schools becoming self-managed, and there's nobody offering anything. We think Unitec could offer it.' And that was the start of it all."

The first two courses were aimed at these leaders, who had to deal with a whole new array of problems. "They had to expand their thinking beyond curriculum, and leaving all the management – like the staff management, financial management, property management – to what were the old regional boards. The principals' roles expanded and they needed to understand what management was all about; and management is mainly about managing people. Property and finance is actually quite

easy, compared to some of the very difficult people problems that they have to cope with."

These were the early years of professionalising the qualifications for education leaders, she says. "Our programmes were growing at the same time as New Zealand Qualifications Authority (NZQA) was established, and all of those interesting programme developments around the early '90s. It was extremely exciting. Everything was on a fast-moving trajectory towards building professional learning for our community of practice."

Since then, the programme has gone through some changes, including making the educational leadership and management papers into post graduate programmes. Cardno was also Unitec's Education Head of Department from 1997 to 2011. "These days I'm concentrating full time on teaching and research," she says.

The focus of Cardno's research career has always been the area of dilemmas. She says that you deal with dilemmas by recognising them, and then utilising productive conversations. She also says that the dilemmas need to be owned by the leader. "On the one hand the leader wants to achieve an organisational goal or purpose, and on the other hand they want to preserve a positive collegial relationship. The dilemma always involves one other key person, but the most important thing is the ownership of that dilemma. To do that, they have to learn not to be defensive, but to use an alternative theory of action, which helps them to be productive."

It's not an easy process. Cardno has seen it work in practice many times, but the road to achieving this new way of relating to others is difficult. "Our instinct is to be defensive, and we have to understand and recognise that, and then we have to want to overcome that instinct. Dealing with human problems like this is the bread and butter of effective management, and to me that's at the heart of managing relationships – being willing to have the tough conversations."

In the course of her career she has completed research in every education sector, from early childhood through to primary and secondary school leaders. Her most recent project has been qualitative research in the Metro Group, made up of the six urban Institutes of Technology and Polytechnics (ITPs). "I've just had one paper published and another paper in press around that project," she says. "It was called Images of Academic Leadership in Large New Zealand Polytechnics. It's talking about how complex the notion of academic leadership is, there are so many different ways of imaging it. The people in the Metro Group were so good in giving me access to go in and do this research. I found that there are three images of educational leadership in the ITPs – the academic leadership that happens from the top, the front line of people doing the job, and then the people who are on the sidelines; the supporters."

She found that the academic leadership staff on the front line tended to have a more difficult time, as they were often pulled in three different directions: the teaching, the managing of their staff, and the research. "Usually they come from industry into polytechnics, say engineering or construction, to become a lecturer. They just get that sorted, and then they become a leader of lecturers, like a programme leader, and then suddenly someone says they should also be researching. One of the interesting things is how they cope with that."

The next phase of that research has Cardno really excited. "I want to study how to make the performance appraisal in the ITP sector something that is really beneficial for all parties. That is, making sure in a higher education setting that it embraces improving the quality of teaching, the quality of research and the quality of managing. I'd like to do research that can actually identify what performance appraisals should be like if they're going to benefit everybody, and most importantly the student, because we are able to constantly enhance their learning experience."

She has also recently published her latest book, *Managing Effective Relationships in Education*. "I wanted to showcase how the findings from twenty years of research activity can be applied to make a difference in education settings," she says.

Cardno says she is inspired by the people around her: colleagues, her students, and her research participants. "I think we've got to constantly search for guidance about how we can improve our practice. That's just the joy of doing this kind of role; you're working with school leaders, programme leaders, principals who all want to learn, and they're so motivated, because they believe their learning will ultimately improve the conditions for their students. It's a very motivational atmosphere to work in."

In the end, Cardno says she wants to make a difference to the education system. "I'm a qualitative researcher, so my work is about talking to people about what works. That's the reward – the people who are prepared to share their impressions and their opinions with me so everybody can benefit from their insights and new ways of looking at things. The purpose is always to do what we do, even better."

"That's just the joy of doing this kind of role; you're working with school leaders, programme leaders, principals who all want to learn, and they're so motivated, because they believe their learning will ultimately improve the conditions for their students."

» contact

Carol Cardno
Professor
Department of Education
ccardno@unitec.ac.nz

Student Research

Unitec congratulates the students who have recently completed significant postgraduate research in their chosen fields. The wide variety of topics reflects Unitec's focus on high quality applied research.

Master of Osteopathy

Name: Aimee Moore
Research: The Efficacy of Surface Electro-myographic Biofeedback Assisted Stretching for the Treatment of Chronic Low Back Pain

Name: YewJin Tan
Research: The Immediate Effect of Dry Needling Levator Scapulae on Neck Rotation Range of Motion

Name: Leigh Townsend
Research: The effectiveness of a mindfulness based stress reduction (MBSR) programme in a mixed chronic pain population

Name: Callum Farquharson
Research: The effect of a non-specific gluteal contraction on transient stiffness of the sacroiliac joint as measured by Doppler Imaging of Vibrations

Name: Alison Fisher
Research: The Effect of Cervical Spine Manipulation on the Postural Sway of Patients with Non-Specific Neck Pain

Name: Kathryn Frith
Research: Investigating inter-relationships between pain, mobility, and posture in patients with chronic neck pain following Osteopathic Treatment

Name: Monique Gasson
Research: The effects of osteopathic treatment on on-specific chronic neck pain and disability

Name: Andre Habib
Research: An exploration of New Zealand osteopaths' attitudes and beliefs about clinical practice guidelines and evidence based medicine: A qualitative study

Name: Stephanie Lo
Research: Perceptions and Attitudes of New Zealand Plunket nurses toward the use of complementary and alternative Medicine (CMA) in children

Name: Martin Ludwig
Research: Inter and Intra-rater Reliability of the Manual Assessment of Respiratory Motion ('MARM' technique) in Adults

Name: Ritisha Mistry
Research: The Attitudes and Self-reported Practices of New Zealand Osteopaths to Exercise Consultation and its use within Osteopathy

Name: Cheri Quinton
Research: A Production Trial of the Omnibus Ratings of Perceived Exertion Scale in treadmill exercise

Name: Tanya Russell
Research: The effects of dance on fall-related self-efficacy and quality of life, and the relationship between psychosocial and physical effects in older adults in New Zealand

Name: Lara Sanders
Research: A spatial analysis of the geographical distribution of musculoskeletal and general practice healthcare clinics in Auckland, New Zealand

Name: Nicholas White
Research: The immediate effect of osteopathic 'rib raising' technique on heart rate variability: A randomised sham controlled experiment

Master of Educational Leadership and Management

Name: Neil Watson
Research: Financial Decision Making in Four New Zealand Secondary Schools

Master of Business

Name: Daniel Hunt
Research: Exploring and Modeling Adolescent Entrepreneurial Learning Behaviours through Antecedents and Consequences

Name: Kalyaney Nou
Research: Conceptualization of Consumer - Brand Relationships: The motivation behind the formation and maintenance of Consumer-Brand Relationships and their consequences

Name: Sandeep Pant
Research: Conceptualising and Measuring Service Culture

Master of Design

Name: Robert Key
Research: What is Design Language in the Service of the Experience of Light?

Name: Janette Cervin
Research: Flowers in a Contemporary Painting Practice

Name: Rosanne Croucher
Research: Strange Connections: An Investigation into the Combining of Recognisable and Disparate Imagery in a Contemporary Painting Practice

Name: Vanessa Gleye
Research: Growing Discontent: Orchestrating a Painting Practice through Mimetic Applications

Name: Theresa Grieben
Research: Visual Storytelling and Journeying

Name: Clarence Lomiwes
Research: The Reframed Portrait: Redefining the Roles of the Artist and the Sitter within the Genre of Portraiture

Name: Dawn McCarthy Clayden
Research: Tabletop Tensions: An Investigation of Contemporary Ceramic Forms

Name: Kirsten Roberts
Research: An Investigation of Interiority: Beyond the Boundaries of Subject and into the Practice of Painting

Name: Helen Robertson
Research: Positive – Creating Meaning Through Narrative and Art Process

Master of Education

Name: Janet Malcolm
Research: Should I Stay or Should I Go? - First Semester Students' Experiences in a Tertiary Institution

Name: Li Jun (Ann) Wu-Ross
Research: Learning and Teaching Experiences in an Offshore Programme: Challenges and Strategies

Name: Aroha Beach
Research: Understanding Choices in the Grouping of Children within Early Childhood Education: A Study of Same-age/Multi-age Grouping Arrangements

Name: Manpreet Dhaliwal
Research: Teacher Perceptions and Management of Challenging student behaviours in Primary School Classrooms

Name: Lee Mui Choong
Research: From Pre-course to Subsequent Learning Experiences: A Study of Confucian-heritage International Students' Perspectives on an Intensive English Course in one New Zealand polytechnic

Name: Hongkham Vongxay
Research: The Implementation of Communicative Language Teaching (CLT) in an English Department in a Lao Higher Education Institution: A Case Study

Master of International Communication

Name: Coralie Owen
Research: Communicating an Organisation's Identity to Library Users: A Case Study within the New Zealand Community Library Sector

Name: Grit Fichter
Research: A Cultural Footprint in Auckland's Public Space

Name: Dapeng Wang
Research: The Role of Cultural Values on the Perception of Advertising as Offensive: A Case Study of Chinese Tertiary Students in Auckland

Master of Computing

Name: Neeharika Veerisetty
Research: Load Balancing in a Distributed Network Environment - An Ant Colony inspired Approach

Name: Ruibin Zhang
Research: A Computational Referencing Approach to Stocks Correlation Analysis

Master of Landscape Architecture

Name: Ryan Hodgson
Research: Designing Community Appropriation

Name: Joanne Leather
Research: Beyond Separatism

Master of Social Practice

Name: Teri Ann Harnell
Research: Created for a Purpose: Implementation and Evaluation The Lighthouse Programme

Name: Selina Ledoux-Taua'aletoa
Research: An Exploration into the Ways in which Multi-Generational Samoan Households Contribute to the Development of Societal and Collective Values about Aiga/Families in Contemporary New Zealand/Aotearoa/Niu Sila

Name: Soukphaphone Phanit
Research: The Relationship Between the Lao People's Democratic Republic (LAO PDR) and the Asean Commission for the Promotion and Protection of the Rights of Women And Children (ACWC) With A Focus On Women

Copies of these studies can be found in the Unitec library or through the Unitec Research Bank, unitec.researchbank.ac.nz

One dance step at a time

Falling over when you're over 65 is more than just a nuisance. It can be painful, debilitating and potentially life-threatening. It also costs the government millions of dollars in rehabilitation and healthcare-related expenses to get this vulnerable section of society back on track after a serious fall.

That's why Master of Osteopathy graduate Steve Chesterfield decided to study the effects of exercise on older people – to look at prevention rather than cure. "The government has cut back on funded exercise opportunities for the older generation, and I thought we needed to do something and get people involved," he says.

Chesterfield, who was the recipient of a Men's Health Trust Scholarship last year, aimed to show that a regular form of exercise would help reduce risk factors associated with falling, and thereby help to prevent falls and fall-related injuries in that age group. Chesterfield decided to use dance as a fun and sociable way to provide his test subjects with exercise over a nine-week period. He used two groups of over-65 adults, who danced once a week over that period. He then measured and analysed their lower extremity muscular strength, lower limb coordination and single leg balance. Fellow graduate Tania Russell concentrated on the psychological and social aspects.

Over the nine weeks Chesterfield says they noted a considerable improvement in the lower limb strength of participants as well as coordination and balance. "These results highlights that dancing as little as once a week can significantly reduce risk factors of falling in the older adult population. Dance is also an enjoyable activity for older adults and therefore the combination of fall preventative benefits with high attendance can help reduce falls in the older adult population and help reduce fall-related health bills."

While the project was a serious one for Chesterfield, he says it was also fun. "As hard as it was to complete the thesis, I thoroughly enjoyed working with the older generation and watching them get their grove on and enjoy themselves."

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phone 0800 10 95 10
fax +64 9 815 2905
web www.unitec.ac.nz
address Private Bag 92025
Victoria St West
Auckland 1142
New Zealand

Mt Albert campus
139 Carrington Rd
Mt Albert
Auckland 1025

Northern campus
10 Rothwell Ave
Albany
Auckland 0632

Waitakere campus
5-7 Ratanui St
Henderson
Auckland 0612

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