Mathematics-in-Industry for New Zealand 2017
Massey University, Palmerston North, New Zealand
26–30 June

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Mathematics is more relevant today than it has ever been. Educators looking for ways to inspire the youth of today in the importance of maths should look no further than the Mathematics in Industry NZ study week. *Now in its third year, it is being held at Massey University, Palmerston North on 26–30 June.* The study week concept has been going now for over half a century around the world.

For fields such as Engineering and Biology, it is easy to see their influence in civilisation through bridges or phones, medicines and food. However, the field of mathematics is often invisible in real-world applications, despite being the backbone of practically everything we do. MINZ is an event which aims to promote the benefits and diverse applications of mathematics by linking mathematicians with industry problems. Many academics, students and industry representatives will converge to solve challenges from NZ industry.

This year we are extremely excited to have challenges from six leading NZ businesses, Fonterra, Zespri, Transpower, Fisher & Paykel-appliances, Sanford Ltd and the Horizons Regional Council. The last tweaks are being made to this year's challenges, which will be posted on the MINZ website soon (http://www.minz.org.nz). The first four of these businesses have experienced MINZ before, and keep coming back because they get such great insights and the opportunity to meet remarkable students and academics from up and down the county. We have had exceptional students participate one year, snapped up by a business and present a new challenge the next year!

To begin to see the range of topics covered at MINZ, and where mathematics is front and centre of new innovations we can look back to review a few interesting examples. The first comes from Compac, an NZ-based fruit-sorting company going from strength to strength. One of their earliest stand-out offerings was the ability to sort fruit for packaging extremely accurately. To be fair, they are talking about thousands of pieces of fruit being bounced and moved on multiple high-speed conveyor belts — not normally conducive conditions for obtaining accurate weights. The information that the mathematicians proved while at the study week provided Compac the evidence needed to build a state-of-the-art machine, supporting their efforts to be a world leader in fruit-sorting equipment.

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Fonterra has supported the use of mathematics, and the MINZ event, for many years as they have on multiple occasions found extremely useful information after posing a challenge to the MINZ group. Fonterra is continually trying to understand techniques and methodology better in order to extract higher values from its milk products. Cheese is a growing high value export but to make this workable in the volumes Fonterra works with they need to get a handle on the dynamics of the process. One challenge needed us to find a way to predict cheese quality months ahead of when it would be ready for distribution. Mathematics provided multiple models taking in all types of variables which allowed the cheese producers the information they needed to make the best decisions, providing cost savings and delivery options to maximise profits.

From white gold to whiteware: today's consumer whiteware is getting smarter and smarter. With multiple sensors, switches and connections it can be complicated to decipher the amount of information being collected and then turn that into useful results. Fisher & Paykel produce some of the most fetching and user-friendly devices in the world. One such device, used by millions of people, is the clothes dryer. We blindly throw in bunched wet clothing, flick a switch and trust that an hour later perfectly dry laundry comes out. How this happens is not magic, but mathematics. It is mathematics that provides the computer in the machines the smarts to decipher all the information being thrown at it, tracking this over time and providing the answer to stop the machine at the correct time. Fisher & Paykel challenged MINZ to obtain a solution to eliminate false cut-offs caused by bunched

clothes for a new dryer product in development, and were extremely pleased at the results, but equally, those at MINZ can look forward into walking into Noel Lemmings and knowing their smarts helped that shiny new F&P dryer stand out from the rest.

These examples only scratch the surface of the challenges at MINZ. The industrial mathematics, engineering and statistical community are keen to hear what challenges await them in June. *Registrations to attend are now open* and can be found on the MINZ website. So join us (it is free) as we further prove the relevance of mathematics in our daily lives, and show direct evidence of its worth to business, industry and society.