

Shintaro Fushida-Hardy

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Research

Feb 2018 - Present, University of Auckland (Bachelor of Science (Honours) project)

Conformal geometry, supervised by Professor Rod Gover. I am studying the asymptotic curvature of constant mean curvature hypersurfaces in spacetimes. The research uses conformal tractor calculus, which is the natural invariant calculus on conformal manifolds. I am currently preparing the results of this research for publication (with Professor Gover).

Nov 2018 - Present, Auckland Bioengineering Institute

Battery modelling, supervised by Distinguished Professor Peter Hunter. I am applying graph-theoretic concepts to create more accurate and meaningful models of Li-ion batteries.

Dec 2017 - Feb 2018, University of Auckland

Fluid dynamics, supervised by Dr. Geoff Willmott. I investigated the drop impact dynamics of ferrofluids. Using high speed cameras, I collected quantitative data describing the dynamics of drop impact ferrofluid instabilities, which had not been done before. The data was meticulously organised and is still in regular use by Dr. Frederick Wells and Mr. Stephen Chung.

Dec 2016 - Sep 2017, University of Auckland

Continuum theory, supervised by Dr. Sina Greenwood. I explored the necessary and sufficient conditions for a generalised inverse limit to be an arc, and determined conditions for each direction. Prior to this research, only arc-like inverse limits had been investigated, rather than arc inverse limits.

Dec 2015 - Feb 2016, University of Auckland

Mathematical biology, supervised by Professor James Sneyd and Associate Professor Vivien Kirk. I investigated the effectiveness of symbolic regression methods to reverse engineer biological models from real data. I concluded that symbolic regression is not yet a useful tool to study calcium dynamics in T-cells, primarily due to insufficient precision in measurements.

Education

2018 - Present, University of Auckland

Bachelor of Science (Honours) (eligible to graduate, First Class Honours). 9.00/9.00 GPA, mathematics.

2015 - 2017, University of Auckland

Bachelor of Science, 8.68/9.00 GPA, mathematics and physics.

2014, Whangarei Boys' High School

National Certificate of Educational Achievement Level 3, Endorsed with Excellence.
Dux (valedictorian) of the school.

2010 - 2013, Huanui College

Cambridge International Examinations AS,
Cambridge International Examinations IGCSE.
I achieved the highest grades in my cohort each year.

Academic Awards

2019, Fulbright Science and Innovation Graduate Award, Fulbright New Zealand

Monetary value: 70,000 USD. (Offered October 2018.)

2018, Collins Prize in Mathematics, University of Auckland

Awarded annually to the student with the best overall result for a Bachelor with Honours in Mathematics.

2018, Senior Scholar Award, University of Auckland

Awarded to the students with the highest overall grades in their major.

2018, University of Auckland Faculty of Science Postgraduate Research Poster Competition

Awarded third place overall and a People's Choice Award.

Winner of the 2018 Department of Mathematics poster competition.

2015 - 2018, First in Course Award, University of Auckland

Awarded to the student who obtained the highest grade in a taught course. (Received in seven courses.)

2017, University of Auckland Postgraduate Honours Scholarship, University of Auckland

Monetary value: 13,000 NZD + course fees.

Awarded to students with a GPA of at least 8.00 who are applying for an Honours degree.

2014, Premier Award, New Zealand Qualifications Authority

Monetary value: 30,000 NZD.

Awarded to students who obtained the top 5-10 highest overall results in the New Zealand Scholarship examinations.

Work Experience

2018 - Present, Auckland Bioengineering Institute

Research Assistant. (See above.)

2016 - Present, University of Auckland

Graduate Teaching Assistant. I tutor approximately 50 university students in undergraduate mathematics courses each semester, most recently having tutored MATHS 332 - Real Analysis and MATHS 340 - Real and Complex Calculus. I also do assignment marking each semester.

2015 - 2017, Crimson Consulting

Tutor. I tutored high school students in Scholarship and NCEA Level 3 Calculus, Physics, Statistics, and Japanese.

2014 - 2015, Salt Air Cafe

I waited, cooked, cleaned, and served at the till.

Other Awards

2013, Assessor's Award, Shakespeare's Globe Centre New Zealand (SGCNZ)

Awarded to a performance chosen by an assessor at the national finals of the University of Otago Sheilah Winn Shakespeare Festival (UOSWSF).

Volunteering and Outreach

Environmental and Social Work

In Whangarei I founded "WECAN", a group to advocate for alternatives to fossil fuels, along with helping to maintain the community garden. Upon moving to Auckland, I was the Environmental Officer of O'Rorke Hall in 2015, and am an active member of the university Fair Trade Society. I have volunteered numerous times for the Royal New Zealand Society for the Prevention of Cruelty to Animals (SPCA).

Youth Leadership

I attended the New Zealand UNICEF Youth Congress and the Thinkers' Conference, held at St Cuthberts, Auckland, in 2013. I also attended the Northland Youth Leadership Summit in 2014, which led to the community project "Paint tha Town".

Maths Craft Festival

In 2016, I volunteered at the Maths Craft Festival, an event designed to elicit an interest in mathematics in the general public. My role was to explain mathematical concepts and inspire the public.

Referees

Professor Rod Gover
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Professor Tom ter Elst
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