

JOSHUA CHEN

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I'm a Masters student in mathematics majoring in mathematical logic, type theory and formal proof systems. My other work is in machine learning and natural language processing, with a current focus on social media analysis.

Education

Masters in Mathematics

University of Bonn, Germany

Oct 2015 – present

B.Sc. (Honours) Mathematics

The Australian National University, Australia

First Class Honours

Jul 2013 – Jul 2014

GPA 80% (Scale: 0–100%)

B.Sc. Mathematics

University of Canterbury, New Zealand

Dean's Congratulations

Feb 2010 – Nov 2012

GPA 8.64 (Scale: 0–9)

Burnside High School

Christchurch, New Zealand

Graduated as Dux

2008 – 2009

Work & Research

Targeted topic modelling for the E2MC disaster response system

Oct 2017 – present

Research assistant, Fraunhofer Institute for Intelligent Analysis and Information Systems

Homotopy type theory in Isabelle/Pure

Sept 2017 – present

Master thesis

University of Bonn

Visualization and enumeration of planar trivalent graphs

Mar 2015 – Oct 2015

Research assistant, the Australian National University

Developed algorithms in Scala to enumerate and automatically draw certain classes of planar graphs, as part of research to understand and classify subfactors and planar algebras.

Code incorporated into <https://bitbucket.org/scottmorrison/toolkit>.

The Temperley-Lieb categories and skein modules

Jul 2013 – Jul 2014

Honours research thesis

Final year Honours thesis in category theory and quantum algebra.

Available on the [arXiv:1502.06845](https://arxiv.org/abs/1502.06845) [math.QA], or alternatively at <https://tqft.net/web/research/JoshuaChen>.

Enumerating integer houses in cyclotomic fields
ANU Summer Research Scholarship

Nov 2012 – Jan 2013

Eight-week selective international undergraduate research program at the Australian National University. I used Mathematica and some abstract algebra to answer questions about the dimensions of objects in fusion categories.

Teaching

- Winter 2017 MA-INF 4111: *Intelligent Learning and Analysis Systems: Machine Learning*
(University of Bonn)
- Summer 2017 MA-INF 4112: *Intelligent Learning and Analysis Systems: Data Mining and Knowledge Discovery*
(University of Bonn)
- Fall 2015 EMTH119: *Engineering Mathematics 1B*
(University of Canterbury)
- Fall 2014 MATH1013: *Mathematics & Applications 1*
(Australian National University)
- Winter 2013 MATH120: *Discrete Mathematics*
(University of Canterbury)

Achievements & Awards

- Jul 2014 Speaker, Australian Mathematical Sciences Student Conference
- Jun 2013 ANU Mathematical Sciences Institute Honours scholarship
- Nov 2012 ANU Summer Research Scholarship
- Jan 2011 University of Canterbury Peter Bryant prize for Pure Mathematics
- Jan 2010 University of Canterbury Dux Scholarship
- Jan 2010 Outstanding Scholar Award, New Zealand NCEA Scholarship exams

Activities

ACADEMIC

- Oct 2014 – Sept 2015 Postgraduate representative, University of Canterbury Mathematics Society. Organized algebraic geometry and set theory reading groups.
- 2013–2014 Active member of the ANU Mathematics Society, giving talks on various topics to mathematical and general audiences.
- 2010–2012 Member of the University of Canterbury Mathematics Society
- Jan 2010 New Zealand International Informatics Olympiad (IOI) selection camp.

OTHER INTERESTS

- Nov 2016 – present I'm a member of **CorrelAid**, a student-run network of young data scientists.
- Jul 2014 I participated in the creation of a **website** modelling the effects of a proposed government

policy to deregulate Australian university fees. This was featured on the Guardian's datablog and received a fair amount of media coverage.

I'm also a keen traceur!