# Cecilia Li

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## Education

Mar 2017 – Nov 2017 **The University of Sydney**, Australia.
*Bachelor of Science (Advanced Mathematics), Honours Class I (Applied Mathematics).*
Completed a year of coursework and research in Applied Mathematics, writing a thesis titled "A Discrete and Continuous Dictionary".

Sep 2015 – Jan 2016 **The University of Nottingham**, United Kingdom.
*International Exchange Program, School of Mathematical Sciences and School of Computer Science.*
Extracurricular Activities: University of Sydney Exchange Representative.

Mar 2014 – Nov 2016 **The University of Sydney**, Australia.
*Bachelor of Science (Advanced Mathematics).*
Majors: Mathematics, Computer Science. Participant in the Science Faculty Talented Student Program.
Extracurricular Activities: Exchange Program Mentor, Sydney Genesis StartUp Program, Sydney University Mathematics Society, Sydney University Information Technology Society.

Jan 2008 – Nov 2013 **Hornsby Girls' High School**, Australia.
*New South Wales Board of Studies Higher School Certificate, ATAR: 99.50.*
NSW Board of Studies Merit List All Rounder and NSW Premier's Award Recipient.
Extracurricular Activities: Senior Prefect, SRC Treasurer, SRC Executive, SRC Junior Representative, High Resolves Leader, School Pianist.

## Academic Achievements

### Research Projects

Mar 2017 – Nov 2017 **A Discrete and Continuous Dictionary (Honours Thesis)**, The University of Sydney, School of Mathematics and Statistics, Supervisor: Robert Marangell.
We investigated results in the fields of second order linear difference equations and second order linear ODEs that seem to be the same in spirit. One such example is the Abel/Liouville/Jacobi identity, which states that the determinant of a fundamental set of solutions obeys a first order linear differential equation. It seems that the determinant of a fundamental set of solutions to a second order difference equation also obeys a first order difference rule. We attempted to explain the reasons for such connections, and used our findings to obtain approximations of solutions to periodic ODEs using orthogonal polynomials; the solutions of which are typically difficult to obtain otherwise.

Jul 2016 – Feb 2017 **Classification of Breathing Patterns Using Machine Learning Techniques**, The University of Sydney, School of Information Technologies, Supervisors: Irena Koprinska, Mark Read, Cindy Thamrin, Chinh Nguyen.
We explored the possibility of diagnosing respiratory disease by classifying fluctuations in breath intervals and airway mechanics. This method offers an advantage over current diagnosis through spirometry, which is difficult to perform and highly dependent on patient co-operation and effort. To classify patterns as healthy or diseased, we used machine learning techniques on data collected from patients in a clinical setting. Potentially relevant features were extracted and used for additional computations. We hope to use this research in developing a home breathing test that diagnoses instances of respiratory disease.

Mar 2014 – Jun 2014 **Unravelling the Dodecahedral Spaces (Group Project)**, The University of Sydney, School of Mathematics and Statistics, Supervisor: Stephan Tillmann.
We first delved into the properties of dodecahedra and the notion of different geometries, such as the Euclidean and hyperbolic geometries. We then used this as a starting point for investigating the world of tessellation, in which we can define different types of dodecahedral spaces depending on the gluing of opposite pentagonal faces, such as the Poincaré and Seifert-Weber spaces. I helped to present our group's findings in the annual Science Faculty Talented Student Program showcase.

### University Awards & Scholarships

2018 **Chris Cannon Prize**.
Awarded for the best Applied Mathematics Honours seminar presentation in 2017.

2017 **K.E. Bullen Scholarship No. III**.
Awarded to the female student who showed the greatest proficiency in Senior units of study prior to enrolling full-time in Applied Mathematics Honours.

2016 – 2017 **University of Sydney School of I.T. Summer Scholarship**.
Funding to extend work on the "Classification of Breathing Patterns Using Machine Learning Techniques" research project over the summer, supervised by Dr. Irena Koprinska.

2016 **University of Sydney Academic Merit Prize**.
Awarded annually to 600 undergraduate students who demonstrate meritorious academic excellence.

2016 **Dean's List of Excellence in Academic Performance**.
Awarded for maintaining a Weighted Average Mark of 85/100 or above in all subjects.

2015 – 2016 **Sydney Abroad International Exchange Scholarship**.
Awarded annually to 350 outgoing exchange students on the basis of academic merit, with students ranked by their Annual Average Mark.

## Experience

### Professional Experience

Mar 2018 – Present **Deloitte Touche Tohmatsu Limited**, Sydney.
*Graduate Analyst, M&A Analytics (Financial Advisory).*

- Wrote back-end functional updates and provided debugging support for the iDeal M&A Analytics and Narrative Science platforms using Dynamic SQL.
- Performed data validation, cleansing and wrangling using Microsoft Excel, Python, SQL and Alteryx, for data to be used in modelling or visualisations. Created visualisations in Tableau to add insight to analyses typically performed during due diligence, such as monthly and rolling LTM movements in revenue, quantities sold and gross margin.
- Constructed a random forest model for a major retail client that predicted shopping malls in Australia with the most potential for revenue uplift, based on Australian census data relating to area demographics and credit card transactional data from a major Australian bank.
- Constructed a linear regression model for a debt collection client that predicted the period at which collections afterwards may not be profitable in comparison to the purchase amount of the debt ledger.
- Established a training program to allow non-technical colleagues the opportunity to learn about the basics of programming, databases and predictive modelling.
- Volunteered as a graduate student representative, answering questions from students in STEM fields interested in applying to Deloitte through the graduate program.

Nov 2016 – Feb 2017 **Deloitte Touche Tohmatsu Limited**, Sydney.
*Summer Intern, Strategic Capabilities (Internal Client Services).*

- Aided in developing analytic frameworks that could be automated in SQL and repeatedly executed by the Audit team. Wrote unit tests for the automated analytics using the tSQLt framework. Created visualisation templates in Tableau that could be implemented as part of the automated platform.
- Worked on the back-end development of the Deloitte Input Tax Accelerator by programming APIs in Dynamic SQL that retrieved and altered data depending on specific user permissions. Wrote unit tests for the back-end code using the tSQLt framework.
- Wrote revision quizzes testing basic programming skills and SQL syntax knowledge, that eventually contributed to the team's new starter training program.
- Contributed to the team's "Tuesday Tutorials" initiative by giving presentations about the potential applications of data mining, predictive modelling and machine learning algorithms in the Audit industry.

Dec 2011 **Commonwealth Scientific and Industrial Research Organisation**, West Lindfield.
*Research Assistant Intern.*

- Work experience placement was supervised by Dr. Jia Du. Assisted in performing experiments and collecting data for Du's research on superconductivity, terahertz radiation and terahertz imaging.
- At the conclusion of the program, gave a presentation to Du's research group about the applications of semiconductor and superconductor devices, SQUIDs and RF receivers for wireless communication.

### Teaching Experience

Feb 2017 – Nov 2017 **The University of Sydney, School of Mathematics and Statistics**, Sydney.
*Academic Tutor.*
Supervised weekly tutorials by summarising lecture content of the previous week and then working through problems with small groups of students. Marked assignments and quizzes for classes taught, and provided feedback to the classes as a whole. Subjects tutored:
- Linear Algebra (MATH1002); Semester 1, 2017.
- Discrete Mathematics (MATH1004); Semester 2, 2017.

### Research Experience

Nov 2018 – Present **The University of Sydney, School of Computer Science**, Sydney.
*Research Assistant.*
- Currently assisting Dr. Irena Koprinska in writing a draft paper about the "Classification of Breathing Patterns Using Machine Learning Techniques" project, aiming for publication in early 2019.

## Skills & Volunteer Experience

### Skills

**Programming**.
Python, R, SQL, MATLAB, Java (proficient); C, C++ (basic).

**Tools & Software**.
Tableau, Weka, Wolfram Mathematica, Alteryx, Git.

**Certifications**.
Accounting 101: How to Read an Accounting Balance Sheet (Udemy).
Introduction to Finance, Accounting, Modelling and Valuations (Udemy).

**Performing Arts**.
Associate in Music, Australia (AMusA) for Piano, 2010.

### Volunteering

Feb 2016 – Present **Girls' Programming Network**, Tutor.
*Established by female University of Sydney I.T. students, the Girls' Programming Network aims to close the gender gap in STEM by introducing female high school students to coding in a relaxed environment.*
- Introduced students to Python syntax and taught basic programming concepts such as data types, arrays and basic control flow statements.
- Helped students to complete simple programming projects. For example, in previous workshops, we have programmed chatbots and Markov chain generators.

Jul 2018 – Aug 2018 **National Computer Science School**, NCSS Challenge Tutor.
*The National Computer Science School Challenge was established to introduce young students to programming and give them an opportunity to improve their problem solving and logical thinking skills.*
- Answered questions and provided hints to students that required help during the challenge; help provided ranged from fixing syntax errors to testing strategies and algorithmic design tips.

Sep 2015 – Nov 2016 **The University of Sydney**, Sydney Abroad Exchange Representative.
*The University of Sydney Study Abroad Office provides former exchange students with several opportunities to remain involved with activities relating to future incoming and outgoing exchange students.*
- Volunteered at the University of Nottingham Study Abroad Fair by answering questions that prospective exchange students had about the application process, partnerships or life in Sydney.
- Guided incoming students by answering their questions about the University of Sydney. Led tours showing students around the main campus and Sydney in general. Helped to organise two social boat cruises to welcome incoming exchange students.
- Attended exchange departure sessions for outgoing students and answered questions that they had about studying at Nottingham or England in general.