

Gerald Huang

Curriculum Vitae

Website: huanggerald.com

– Research Interests –

Algorithms (approximation, exact, lower bounds, parameterised), computational geometry and topology, complexity theory, combinatorics (algebraic, enumerative, extremal), combinatorial optimisation, number theory.

– Education –

- 2018 – 2024 **University of New South Wales**, Sydney, New South Wales, Australia.
B. Sc. in Computer Science with Honours, B. Sc. in Mathematics (Pure Mathematics)
*with Distinction; specialised in **theory**.*
- **Supervisor:** Prof. Serge Gaspers.
 - **Awards and Honours:** UNSW Taste of Research Scholar, 2023.
 - **Ranks:** 1st/941 in COMP3121/9101, 1st/162 in MATH2400, 2nd/138 in MATH3871/5219, 3rd/36 in MATH3361/5213, 4th/17 in MATH5515, 5th/25 in COMP3153/9153, 11th/73 in COMP4141.

– Employment –

- 2023 – 2024 **Research Assistant**, *University of New South Wales.*
- **Advisor:** Prof. Ron Van der Meyden.
 - **Project:** *Model checking – MCK.*
- 2023 – **Course Administrator**, *University of New South Wales.*
- **COMP4418:** *Knowledge Representation and Reasoning.*
- 2023 – **Teaching Assistant**, *University of Sydney*
- See [\[teaching\]](#).
- 2021 – **Teaching Assistant**, *University of New South Wales*
- See [\[teaching\]](#).

– Publications –

Research

Each *published* paper can be accessed via the link if viewing on a desktop; they can also be accessed via my [website](#).

- [1] Quantum Algorithms for Steiner Trees. With Serge Gaspers. 2023.

[2] Implementation and Analysis of Quantified Boolean Formula Encodings for Planning and Verification Problems. With Abdallah Saffidine. 2022 – 2023.

[3] Notes on the Union-Closed Sets Conjecture. With Thomas Britz. 2022.

Books

Books that I have either released or are in the process of being released. Chapter preprints are available on my [website](#).

[1] *An Invitation to Algorithm Design and Analysis*. 1st edition, 2024.

[2] *An Invitation to Combinatorics*. 1st edition, Springer Undergraduate Texts in Mathematics and Technology, 2024.

[3] *ATAR Notes HSC Year 12 Mathematics Extension 1 Complete Course Notes*. 1st edition, ATARNotes, 2020.

[4] *ATAR Notes HSC Year 12 Mathematics Extension 1 Topic Tests*. 1st edition, ATARNotes, 2020.

Notes and Articles

You can find a more complete set of notes and articles that I've written on my [website](#).

[1] *Derandomisation and the Nisan-Wigderson Construction*, September 2023.

[2] *The Sunflower Lemma and its Modification*, September 2023.

– Teaching –

The rating (out of 6.0) comes from the students' evaluation of the instructor quality throughout the course. Undergraduate teaching is done through tutorials. Teaching is separated by university.

- Nominee for Award for Outstanding Contributions to Student Learning.

University of New South Wales

Term	Course number and title	Rating (where applicable)
Term 3, 2023	COMP9101: Design and Analysis of Algorithms	N/A
Term 3, 2023	COMP4418: Knowledge Representation and Reasoning	N/A
Term 3, 2023	COMP3121: Algorithms and Programming Techniques	N/A
Term 3, 2023	COMP2521: Data Structures and Algorithms	
Term 3, 2023	MATH1041: Statistics for Life and Social Sciences	N/A
Term 3, 2023	Mathematics Drop-in Centre	N/A
Term 2, 2023	COMP9900: Information Technology Project	6.0 / 6.0
Term 2, 2023	COMP3900: Computer Science Project	5.25 / 6.0
Term 2, 2023	COMP3153: Algorithmic Verification	5.48 / 6.0
Term 2, 2023	COMP3121: Algorithms and Programming Techniques	5.31 / 6.0
Term 2, 2023	Mathematics Drop-in Centre	N/A
Term 1, 2023	COMP9101: Design and Analysis of Algorithms	5.08 / 6.0
Term 1, 2023	COMP4141: Theory of Computation	5.63 / 6.0
Term 1, 2023	COMP3821: Extended Algorithms and Programming Techniques	5.51 / 6.0
Term 1, 2023	COMP3121: Algorithms and Programming Techniques	5.48 / 6.0
Term 1, 2023	Mathematics Drop-in Centre	N/A
Term 3, 2022	COMP9900: Information Technology Project	5.75 / 6.0

Term 3, 2022	COMP9101: Design and Analysis of Algorithms	N/A
Term 3, 2022	COMP4418: Knowledge Representation and Reasoning	N/A
Term 3, 2022	COMP3121: Algorithms and Programming Techniques	N/A
Term 3, 2022	Mathematics Drop-in Centre	N/A
Term 2, 2022	COMP9101: Design and Analysis of Algorithms	N/A
Term 2, 2022	COMP3153: Algorithmic Verification	5.40 / 6.0
Term 2, 2022	COMP3121: Algorithms and Programming Techniques	N/A

University of Sydney

Semester	Course number and title	Rating (where applicable)
Semester 2, 2023	COMP2022: Models of Computation	N/A
Semester 1, 2023	COMP3927: Advanced Algorithm Design	N/A
Semester 1, 2023	COMP3027: Algorithm Design	N/A

– Talks and Lectures –

Student Talks

Student talks that come from societies are marked with *, whilst student talks that come from conferences are marked with o.

- [1] [On the Transcendence of \$e\$](#) *, UNSW Mathematics Society, June 2023.
- [2] [When Combinatorics and Flow Networks Intersect](#)*, UNSW Computer Science and Engineering Society, UNSW Competitive Mathematics and Programming Society, March 2023.

– Extra-curricular Activities –

Leadership and Societies

I have been involved in multiple leadership positions in faculty-focused societies.

- [1] [UNSW Mathematics Society](#): Education Subcommittee (2019, 2022, 2023), Director of Education (2020), Society Executive (2021).
- [2] [UNSW Computer Science and Engineering Society](#): Education Subcommittee (2023).

Reading Group

I am also actively involved in a reading group for *Advanced Topics in Theoretical Computer Science* run by the Faculty of Computer Science and Engineering.