

Timothy Roberts

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Education

- **Brown University** **Providence, RI**
PhD Candidate, Applied Mathematics, Currently enrolled *Sept 2019 – present*
 - Advisor: Bjorn Sandstede
 - Coursework including: Nonlinear Dynamical Systems, Real and Functional Analysis, Numerical Analysis, Theory of Probability, Applications of Probability and Statistics, Graphs and Networks
- **University of Sydney** **Sydney, Aus**
BSc. (Advanced Mathematics)(Honours), Honours Class I and the University Medal *2014–2017*
 - Awarded Joye Prize in Mathematics for earning the highest mark in the Honours Program
 - Honours in Applied Mathematics with supervisor Martin Wechselberger
 - Major in Mathematics

Publications

- [1] Kristen E. Harley, Peter van Heijster, Robert Marangell, Graeme J. Pettet, Timothy V. Roberts, and Martin Wechselberger. (In)stability of Travelling Waves in a Model of Haptotaxis. *SIAM Journal on Applied Mathematics*, 80(4):1629–1653, January 2020.

Presentations

Invited Talks.....

- **SIAM Dynamical Systems 2021** **Virtual**
Stability of Traveling Fronts by the Riccati-Evans Function
 - Minisymposium 100: Wave and Front Dynamics: Propagation and Stability Organised by Paul Carter and Montie Avery
 - Awarded the SIAM Travel Award to fund my attendance
- **SIAM Dynamical Systems 2019** **Snowbird, UT**
Using Geometry to Detect Stability: The Riccati-Evans Function
 - Minisymposium 158: Recent Developments in Dynamics of Localized Patterns Organised by Shin-Ichiro Ei, Takashi Teramoto and Peter van Heijster.

AustMS 2018

Adelaide, Aus

- *(Un)Stable (non)physical waves in a model of tumour invasion*
 - Special Session for Dynamical Systems and Ergodic Theory Organised by Cecilia Gonzalez-Tokman and Robert Marangell
 - Awarded the AustMS Student Support Scheme which funded my attendance
 - Awarded one of two Honourable Mentions for the Von Neumann Prize given to the best student talk

Contributed Talks

ANZIAM 2018

Hobart, Aus

- *Neurons, temperature and timescales*

Conference and Workshop Attendance

Equadiff 2018

- *Leiden, NL*

Slow-Fast-ival 2019

- *International Centre for Mathematical Sciences, University of Edinburgh*

Sydney Dynamics Group Workshop 2018

- *Sydney, Aus*

Research Experience

Brown University

Providence, RI

- *Graduate Student Researcher*

2020–present

- Adviser: Bjorn Sandstede
- Study the existence and stability of source defects in the Brusselator with particular focus on their arrangement into snaking bifurcations of 1-d targets and spirals.

Sydney University

Sydney, Aus

- *Postgraduate Research Project*

2018–2019

- Adviser: Robert Marangell
- Developed and implemented a new numerical scheme for calculating the stability of 1-d fronts and pulses (the Riccati-Evans function) using geometric insights and applied this method to a cancer invasion model.
- Results published in [1].

Sydney University

Sydney, Aus

- *Honours Research Project*

2017

- Adviser: Martin Wechselberger

- Applied geometric singular perturbation theory (GSPT) to a model of neuron fire in the brain to try elucidating the mechanisms behind thermoregulation in the brain of mammals.

Teaching and Mentoring

Teaching Experience

Brown University

Providence, RI

- *Graduate Teaching Assistant*

2020–2021

- APMA0650 Essential Statistics (Spring 2021)
- APMA0360 Applied Partial Differential Equations I (Fall 2020)

- **Sydney University** **Sydney, Aus**
Tutor *2017–2019*
 - MATH2921 Vector Calculus and Differential Equations (Advanced) (Sem 1 2019)
 - MATH3078/MATH3978 Partial Differential Equations and Waves (Normal/Advanced) (Sem 2 2018)
 - MATH1023 Multivariable Calculus and Modelling (Sem 2 2018)
 - MATH2921 Vector Calculus and Differential Equations (Advanced) (Sem 1 2018)
 - MATH1021 Calculus of One Variable (Sem 1 2018)
 - MATH1003 Integral Calculus (Sem 2 2017)
 - MATH1901 Differential Calculus (Advanced) (Sem 1 2017)

Qualifications and Training.....

- **Brown University** **Providence, RI**
Sheridan Teaching Seminar - Reflective Teaching (Certificate 1) *Fall 2020*
 - A semester long seminar designed to develop and refine basic teaching practices and evidence-based teaching skills and strategies. Particular focus is given to critical reflection, inclusivity, rhetorical practice, classroom communication, learning design and active learning strategies.

Mentoring Experience.....

- **Brown University** **Providence, RI**
Directed Reading Program *Fall 2021*
 - An extracurricular activity that match undergraduate students and graduate students with similar interests to participate in a reading project over the course of a semester. Graduate students are responsible for planning the project and mentoring their undergraduate counterpart, including weekly meetings and help producing a written proposal and talk.

Service

- **Society of Industrial and Applied Mathematics - Brown Chapter** **Brown University**
Officer, Co-organiser of BMCM *Fall 2021-present*
 - Brown University's chapter of the Society of Industrial and Applied Mathematics (SIAM) - a community of students, postdocs and faculty interested in applied and interdisciplinary mathematics. We organize professional, academic and social events including latex tutorials, industry and internship panels and competitions.
 - The Brown Mathematics Contest for Modelling (BMCM) is a student competition where small groups attempt to answer open-ended, real world questions by analysing data or constructing mathematical models.