

Brody Foy

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- EDUCATION** *Doctor of Philosophy* Oct 2015-Aug 2018
Thesis: *Applied Mathematical Modelling of Pulmonary Function Tests*
Department of Computer Science, University of Oxford, Oxford, UK.
- Bachelor of Mathematics (1st class Honours)* Feb 2011-Dec 2014
Major: Applied and Computational Mathematics
Queensland University of Technology (QUT), Brisbane, Australia.
- SOFTWARE EXPERIENCE** High-level: Python, R, Matlab, Netlogo, Excel, L^AT_EX
Mid-level: C#, C++
Low-level: Java, HTML
- WORK EXPERIENCE** *Post-doctoral Research Fellow* Nov 2018-Present
Harvard University/Massachusetts General Hospital, Boston, USA.
- Undertaking hematological modelling within the Center for Systems Biology.
 - Collaborating closely with NYU's machine learning group.
- Co-Founder, Chief Technology Officer* June 2016-Dec 2017
Rhodes Artificial Intelligence Lab (RAIL), Oxford, UK.
- RAIL performs non-profit AI consulting for social good: www.rhodeslab.com.
 - Projects I scoped and oversaw as CTO include:
 - Improving homeless service delivery for the NYC government.
 - Drug discovery with Public Health England.
 - Diabetes diagnosis with a developing nation's largest health insurer.
- Lecturer, Assistant Unit Coordinator* Jan 2015-Sep 2015
Department of Mathematics, QUT, Australia.
- Designed and taught courses with a total cohort of 2000 students, in mathematics, engineering, statistics and programming.
- Logistics Manager* Nov 2013-Mar 2016
Spur Projects, Brisbane, Australia.
- Developed and implemented mental health programs across Australia.
 - Helped coordinate an international campaign with over 10,000 participants.
- State Director* Nov 2012-Feb 2014
Left-Right Think-Tank, Brisbane, Australia.
- Oversaw all operations for the QLD branch of the youth policy think-tank.
 - Designed and advocated policy papers on infrastructure, e-governance and tax reform to the federal government.

RESEARCH

My research interests include machine learning, computational fluid dynamics, modelling biological and medical processes, and numerical analysis.

Some selected recent/upcoming publications are:

Systems Medicine

- A computationally tractable scheme for simulation of the human pulmonary system. *Journal of Computational Physics* (under review).
- Lung computational models provide unique insights into the clinical role of the small airways in asthma. *Nature Medicine* (under review).
- Characterising the role of small airways in asthma using low-frequency forced oscillations. *Science Translational Medicine* (under review).
- Modelling the effect of gravity on inert-gas washout outputs. *Physiological Reports* (2018).
- A computational comparison of the multiple-breath washout and forced oscillation technique as markers of bronchoconstriction. *Respiratory Physiology and Neurobiology* (2017).
- Modelling responses of the inert-gas washout and MRI to bronchoconstriction. *Respiratory Physiology and Neurobiology* (2017).
- Travelling waves for a velocity-jump model of cell migration and proliferation. *Mathematical biosciences* (2013).

Other

- An efficient mesh-free scheme for simulating high-dimensional conservation problems. (in writing).
- Predicting pediatric sleep apnea with machine learning: A proof of concept on 456 patients. *Journal of Sleep* (under review).
- The Meshfree Finite Volume Method with application to multi-phase porous media models. *Journal of Computational Physics* (2017).
- Structural modelling of deformable screens for large door openings. *Australia and New Zealand Industrial and Applied Mathematics Journal* (2016).

For a full list of research publications, please see www.brodyfoy.com.

AWARDS

Rhodes Scholarship (Queensland & New College)	2015
QUT Performance Excellence Award	2015
QUT University Medal	2014
QUT Student Leader of the Year	2013
QUT Volunteer of the Year	2013

OTHER

Developed a 3D mapping device contained inside a backpack, deployed in rural Colombia. Used to improve safety in mine networks.

President and Founder of QUT Mathematics Society (2012-2014)
Grew membership from 0 to 300 people in 2 years.

Amateur stand-up comedian.

Performed on the Brisbane scene for nearly 4 years.