

# DAVID JOHN ARNOLD

✉ darnold@math.ucla.edu ☎ +1 310 666 6863

## EDUCATION & EXPERIENCE

---

- 2008 – 2012    The University of Adelaide  
Bachelor of Mathematical and Computer Sciences with First Class Honours  
Thesis title: *Simulations of fluid mixing in batch stirring devices using smoothed particle hydrodynamics and Stokes flow theory*  
Supervisors: Dr Trent Mattner and Dr Matthew Finn
- 2013 – 2016    The University of Adelaide  
Ph.D in Applied Mathematics  
Thesis title: *Thin-film flow in helical channels*  
Supervisors: Prof Yvonne Stokes and Dr Edward Green
- 2016 – 2019    Department of Mathematics, University of California Los Angeles  
Assistant Adjunct Professor  
Postdoctoral Mentor: Prof Andrea Bertozzi
- 2019 –          Department of Mathematics and Statistics, Macquarie University  
Lecturer in Applied Mathematics

## PUBLICATIONS

---

### PUBLISHED OR ACCEPTED

- 2020          Christian Parkinson, David J. Arnold, Andrea L. Bertozzi and Stanley Osher, *A Model for Optimal Human Navigation with Stochastic Effects*, SIAM Journal of Applied Mathematics, (to appear)
- 2019          D. J. Arnold, Y. M. Stokes, J. E. F. Green, *Particle-laden thin-film flow in helical channels with arbitrary shallow cross-sectional shape*, Physics of Fluids, **31**, (2019)
- 2019          Christian Parkinson, David J. Arnold, Andrea L. Bertozzi, Yat Tin Chow and Stanley Osher, *Optimal Human Navigation in Steep Terrain: a Hamilton-Jacobi-Bellman Approach*, Communications in Mathematical Sciences, **17**(1), 2019
- 2019          David J. Arnold, Dayne Fernandez, Ruizhe Jia, Christian Parkinson, Deborah Tonne, Yotam Yaniv, Andrea L. Bertozzi, and Stanley J. Osher, *Modeling environmental crime in protected areas using the level set method*, SIAM Journal of Applied Mathematics, **79**(3), (2019)
- 2017          D. J. Arnold, Y. M. Stokes, J. E. F. Green, *Thin-film flow in helically-wound shallow channels of arbitrary cross-sectional shape*, Physics of Fluids, **29**, (2017)
- 2015          D. J. Arnold, Y. M. Stokes, J. E. F. Green, *Thin-film flow in helically-wound rectangular channels of arbitrary torsion and curvature*, Journal of Fluid Mechanics, **764**, (2015)

## MENTORING

---

- 2018 UCLA Applied Math REU program mentor. Led group of undergraduate and postgraduate students using machine learning to study topic structure in tweets from the LA area.
- 2017 UCLA Applied Math REU program mentor. Led group of undergraduate, Masters, and PhD students modelling environmental crime in protected areas.
- 2017 Co-mentor for a MATH 199 Directed Research class. Supervised group of eight undergraduates performing experiments on particle-laden flows on inclined planes.

## LECTURING

---

- Math1020 Mathematical Modelling IB (and IB Advanced) (two offerings). Convened 1020 twice and 1025 once. First year class continuing on from Math135/Math1010/Math1015.
- Math135 Mathematical Modelling IA (one offering). First year maths unit covering linear algebra and calculus.
- Math 32A Calculus of Several Variables (three offerings). Large lower division class covering: introduction to vectors, vector-valued functions, calculus of space curves, limits and continuity of functions of several variables, partial derivatives, the gradient, optimisation, Lagrange multipliers
- Math 151B Applied Numerical Analysis (two offerings). Upper division course covering: numerical solutions to initial and boundary value problems, solving systems of nonlinear equations, approximating eigenvalues, function approximation
- Math 142 Mathematical Modelling (six offerings). Upper division class covering: introductory mathematical modelling, dimensional analysis, traffic flow, perturbation theory, population modelling

## PRIZES & SCHOLARSHIPS

---

- 2012 Department of Further Education, Employment, Science and Technology Defence Scholarship for Honours
- 2012 Wazim Hasan and Amir Hasan Abdi Prize for best Honours performance in the School of Mathematical Sciences at the University of Adelaide
- 2013 – 2016 Australian Postgraduate Award Ph.D Scholarship
- 2015 Honourable mention, T. M. Cherry Prize for best student talk at ANZIAM2015 conference
- 2016 T. M. Cherry Prize for best student talk at ANZIAM2016 conference
- 2016 Dean's Commendation for Doctoral Research Excellence, The University of Adelaide

DAVID ARNOLD

✉ david.arnold@mq.edu.au ☎ +61 438 100 411