David John Arnold

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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 – 2020 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, **80**(4), 2020

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