# 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 – 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

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| 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

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| 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

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| 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 |