

Ioannis P. A. Papadopoulos

Department of Mathematics, Imperial College London

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EMPLOYMENT

Research Associate, Imperial College London Jul. 2021 – date

- EPSRC Grant: *Spectral element methods for fractional differential equations, with applications in applied analysis and medical imaging.*
- Research interests: Numerical analysis, spectral & finite element methods, fractional & nonlinear PDEs, topology optimization.

The MathWorks, Inc., Cambridge 2019 – 2020

- Undertook an 8 week placement with the GPU & deep learning group (2020) and an 8 week placement with the parallel toolbox group (2019).
- Generated use cases for higher order automatic differentiation in **deep learning**.
- Developed the framework for a C++ wrapping of cuSOLVER CUDA functions.
- Designed a GUI for displaying profiling statistics of parallel functions in MATLAB.

EDUCATION

DPhil in Mathematics, University of Oxford, viva date: 24 Sep. 2021 2017 – 2021

- Title: *Computing multiple solutions of topology optimization problems.*
- Supervisors: Prof. Patrick Farrell and Prof. Endre Süli.
- EPSRC Centre for Doctoral Training in Partial Differential Equations.
- **Scholarships:** Obtained a **MathWorks scholarship** for financial support during a PhD.
- **Awards:** Won the judges' and people's first choice awards in the departmental three-minute thesis competition.

MSc in Mathematical Modelling and Scientific Computing, 2016 – 2017
University of Oxford (Distinction)

- Dissertation: *Computing and controlling transitions in multi-stable partial differential equations* supervised by Prof. Patrick Farrell.
- **Awards:** Won the **Durham Prize**, awarded by Keble College for performance during an MSc.

BSc in Mathematics, Imperial College London (First Class Honours) 2013 – 2016

- **Awards:** Won the **Gerald Whitrow Prize**, awarded for excellence during the final undergraduate examinations, and earned a spot on the **Dean's List**, awarded to the top 10% of the cohort.
- **Scholarships:** Obtained an undergraduate research bursary from the **London Mathematical Society** (2015) and an Imperial College London Undergraduate Research Bursary (2014) to undertake research during the summers of my undergraduate degree.

PUBLICATIONS

- I. P. A. Papadopoulos, P. E. Farrell, T. M. Surowiec, *Computing multiple solutions of topology optimization problems*, SIAM Journal on Scientific Computing, 2021; [link to paper](#), [link to software](#).
- I. P. A. Papadopoulos, E. Süli, *Numerical analysis of a topology optimization problem for Stokes flow*, Journal of Computational and Applied Mathematics, 2022; [link to paper](#).
- I. P. A. Papadopoulos, *Numerical analysis of a discontinuous Galerkin method for the Borrvall-Petersson topology optimization problem*, SIAM Journal on Numerical Analysis, 2022; [link to paper](#).
- I. P. A. Papadopoulos, P. E. Farrell, *Preconditioners for computing multiple solutions in three-dimensional fluid topology optimization*, submitted, 2022; [link to preprint](#), [link to software](#).
- I. P. A. Papadopoulos, S. Olver, *A sparse spectral method for fractional differential equations in one-spacial dimension*, in preparation, 2022.

TALKS

Sparse spectral methods for fractional PDEs

- PDE CDT Reunion Conference July 2022

Numerical analysis of a topology optimization problem for Stokes flow

- Joint UCL-Imperial College London Numerical Analysis Seminar October 2021
- Numerical analysis internal seminar at the University of Oxford May 2021
- PDE CDT Lunchtime Seminar at the University of Oxford January 2021

Preconditioners for computing multiple solutions in three-dimensional fluid topology optimization

- PRISM Workshop January 2022
- Numerical analysis internal seminar at the University of Oxford January 2021

Computing multiple solutions of topology optimization problems

- GAMM 2022 Conference - Young Researcher's minisymposium August 2022
- Oxbridge Applied Mathematics "Woolly Owl" Meeting September 2021
- World Congress of Structural and Multidisciplinary Optimization (WCSMO14) July 2021
- ICOSAHOM 2020/2021 Conference July 2021
- FEniCS 2021 Conference March 2021
- Numerical analysis internal seminar at the University of Oxford January 2021
- PDE CDT Lunchtime Seminar at the University of Oxford January 2021
- Numerical analysis internal seminar at the University of Oxford December 2019
- PDE CDT student seminar at the University of Oxford December 2019
- Junior applied mathematics seminar at the University of Oxford December 2019
- Internal seminar at Universität Bayreuth July 2019

SUPERVISING & TEACHING

Co-supervisor, *Department of Mathematics, Imperial College London* 2021–2022

- Co-supervised a 4th year undergraduate dissertation.
- Co-supervised a 2nd year group project on deflation who won the **Winton Capital Second Year Project Prize**.

Teaching Assistant/Tutor, *Mathematical Institute, University of Oxford* 2018 – 2021

- Courses: continuous optimization (year 3/4 course), numerical linear algebra (year 3/4 course), functional analysis I (year 3 course), numerical solution of differential equations I (year 3 course), numerical solution of differential equations II (year 3 course), scientific computing and numerical analysis of PDEs (PhD course), further PDEs (MSc course).
- Marking and presenting solutions of problems to students.

Tutor, *Oxford Study Abroad Programme, University of Oxford* 2020 – 2021

- Continuous Optimization - one-on-one tutoring covering the UCLA syllabus in 8 weeks.

MATHEMATICAL ENGAGEMENT

- President of the University of Oxford SIAM Student Chapter 2020–2021
- Active member of the Oxford numerical analysis reading group 2019–date
- Peer reviewer for *Computer Methods in Applied Mechanics and Engineering* 2021–date
- Organizing a minisymposium at CSE23 on fast spectral methods February 2023

ADDITIONAL INFORMATION

Languages English (native), Greek (fluent)

Computing Julia, Python (FEniCS & Firedrake), MATLAB (Chebfun), \LaTeX , C, C++