Ioannis **Nikiteas**

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Education

PhD in Computational Nuclear Physics — *London, UK*

Imperial College London — *Jan. 2019 – PRESENT*

- Researched and authored algorithms for error estimation used in multidimensional adaptive mesh refinement
- Authored performant and scalable algorithms for massively parallel architectures (ARCHCER & ARCHER2 HPCs)
- Funded via Imperial College, Cambridge University & Open University (ICO) CDT and **Jacobs Engineering**

MSc in Advanced Nuclear Engineering — *London, UK*

Imperial College London — *Sept. 2017 – Sept.2018*

- Obtained knowledge and developed skills on the fields of Material Science, Nuclear, Mechanical and Chemical Engineering
- Thesis on Dynamic Load balancing on angular adaptive mesh refinement for radiation transport

BSc in Experimental Physics — *Egham, UK*

Royal Holloway University of London — *Sept. 2014 – May. 2017*

- Obtained fundamental skills for analysing and solving problems in the fields of Physics and Mathematics
- Dissertation title: Investigating the transition from Molecular Dynamics to Smoothed Particle Hydrodynamics

Awards & Scholarships

Scholarships

2017 **Alexander S. Onassis Public Benefit Foundation**, Scholarship for academic excellence £13,000 — *Athens, Greece*

Experience

Senior Research Software Engineer — *London, UK*

ToffeeX — *Nov. 2022 – PRESENT*

- Lead the development of software products for reverse engineering to CAD, CAE meshing, and geometry modelling
- Work on the development of CFD and topology optimisation software products
- Work on developing a multi-scale finite element fluid-structure optimisation solver for coldplate designs
- Setup and maintain the CI, CD and testing pipelines for the core products of the company
- Responsible for enforcing software engineering best practices and improving code quality of the core codebases
- Work in an AGILE environment, with emphasis on collaborative practices

Administrator & Maintainer & Software Engineer — *London, UK*

Fortran-lang – The Fortran Programming Language — *Jan. 2021 – PRESENT*

- Administrator of the open-source **Fortran-lang** organisation, a NUMFOCUS fiscally sponsored project, and maintainer of the projects under the **Fortran-lang GitHub** organisation
- Author of **fortls** Language Server for Fortran & **Modern Fortran for Visual Studio Code** extension. Maintainer of the rest of our codebases and DevOps infrastructure
- Org Admin, supervisor and mentor for the **Google Summer of Code** program, for multiple projects
- Collectively secured a €800,000+ grant from the **Sovereign Tech Fund** to develop new open-source tools for Fortran-lang projects (package managers, package registries, compilers, high level APIs to linear algebra libraries, etc.)

Research Software Engineer — *London, UK*

Imperial College London - Applied Modelling and Computation Group — *Jan. 2019 – Dec. 2022*

- Developed and maintained core codebases of AMCG including FETCH2 for simulating radiation transport in nuclear reactors, shielding, and criticality applications, as well as Fluidity CFD, using Fortran, C, C++, and Python while following AGILE practices
- Implemented adjoint-driven adaptive mesh refinement algorithms for radiation transport in a FEM framework with arbitrary discretisations to improve solution accuracy while reducing computational cost
- Designed scalable algorithms with hybrid parallelism (MPI, OpenMP) for dynamic load balancing, performing extensive profiling-driven development
- Managed the CI, CD and DevOps infrastructure for on-premise and Tier 1/2 HPC clusters

StudentShapers Placement - Research Computing and Data Science Exemplars (ReCoDE) — *London, UK*

Imperial College London — *Jul. 2022*

- Reviewed, edited and improved Computational & Data Science projects targeted at training PhD candidates across multiple disciplines.
- Worked on 5 projects in vastly different fields: Computer Vision & Convolutional Neural Networks, Nuclear Engineering using Diffusion theory, Physics modelling using Markov Chain Monte Carlo, RNA sequencing of biological data, COVID-19 Transmission modelling using Bayesian inference
- Worked with various programming languages: Python, Fortran, R, STAN

Graduate Teaching Assistant *London, UK*

Imperial College London *Dec. 2018 – Dec. 2022*

Taught various principles of programming, linear algebra, numerical methods and computational modelling to Undergraduate and Postgraduate students. Modules: 375 Advanced Programming C++, ACSE-5 Numerical methods with C++, ACSE-6 Parallel Programming using MPI

Intern Engineer, Maintenance of Alumina, Non-Invasive Testing Methods *Viotia, Greece*

Aluminium of Greece *Jul. 2016 – Aug. 2016*

- Was part of a team responsible for the optimisation and maintenance of equipment used in the production of aluminium oxide (alumina)
- Was familiarised with methods and techniques used to investigate for structural failures in industrial equipment
- Performed non-destructive testing (e.g. Ultrasonic testing, liquid penetrant, eddy-current testing, remote visual inspection)

Publications

A subspace method for 3D multiscale heat sink modelling and optimization – prepript

D. Thillaithevan, R. Hewson, R. Murphy, M. Santer, A. Carver, G. Nikiteas, N. Raske

Structural and Multidisciplinary Optimization (Mar. 2025). American Institute of Physics Inc., 2025

Load balancing angular adaptivity on energy dependent reactor problems

Nikiteas, Ioannis, Dargaville, Steven, Smith, Paul N. Smedley-Stevenson, Richard P. Pain, Christopher C.

EPJ Web Conf. 247 (Feb. 2021) p. 03025. 2021

Reentrant melting and multiple occupancy crystals of bounded potentials: Simple theory and direct observation by molecular dynamics simulations

I. Nikiteas, D. M. Heyes

Phys. Rev. E 102 (4 Oct. 2020) p. 042102. American Physical Society, 2020

Impact of load balancing on parallel performance with Haar wavelets angular adaptivity

I. Nikiteas, S. Dargaville, C. C. Pain, P. N. Smith, R. P. Smedley-Stevenson

International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering, (M&C 2019), 2019

Bounded inverse power potentials: Isomorphism and isosbestic points

I. Nikiteas, D. M. Heyes

J. Chem. Phys 150.14 (Apr. 2019) p. 144504. American Institute of Physics Inc., 2019

Skills and Interests

Programming	Python, C/C++, Fortran, TypeScript, Bash and many more…
Other Software	Git, LaTeX, Inkscape, FreeCAD, GMSH, VTK, ParaView, Blender, OpenFOAM, FEniCS
Languages	English, Greek, French
General Skills	Communication, Leadership, Multidisciplinary Teamwork, Risk assessment, Report authoring, Experimental design
Interests	Coding, Interactive data visualisation, Active member of the Fortran Programming Language Orgnanisation