Ioannis **Nikiteas**

London, United Kingdom

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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
- Wrote performant and scalable algorithms for massively parallel architectures (ARCHCER & ARCHER2 HPCs)
- Performed advanced data visualisation of high dimensionality data
- Software developer at FETCH2 and Fluidity , using Fortran, C, C++ and Python
- 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

International Baccalaureate Diploma

Athens, Greece

The Moraitis School

2012 – 2014

- Overall Score 36/45 with; Physics HL: 7/7, Math HL: 6/7, Chemistry SL: 5/7

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

Dec. 2022 – PRESENT

- Single-handedly lead the development of software products for reverse engineering of complicated, organic 2D and 3D meshed geometries to NURBS and CAD models
- Work on the development of CFD and topology optimisation software products
- Work on advanced geometry modelling, meshing and CAD software products
- Work on commercialising an automated system for the solution of partial differential equations using the finite element method (FEM) as part of an EPSRC grant with Imperial College London
- 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
- Work on the development of a cloud-based platform for the deployment of the software products (SaaS)
- 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

Fortran-lang – The Fortran Programming Language

London, UK

Admin – Maintainer

Jan. 2021 – PRESENT

- Administrator of the **Fortran-lang** organisation, a NUMFOCUS fiscally sponsored project, and maintainer of the projects under the **Fortran-lang GitHub** organisation
- Author and principal developer of **fortls** Language Server for Fortran & **Modern Fortran for Visual Studio Code** extension
- 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.)

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 both final year Undergraduate students and Master's students:

- Module: 375 Advanced Programming C++
- Module: ACSE-5 Numerical methods with C++
- Module: 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)

Projects

Gmsh Fortran API

London, UK

Author – Maintainer

Sept. 2022 – PRESENT

- Author and maintainer of the Python autogenerated Fortran API for the popular **Gmsh** meshing library
- Author and maintainer of the Fortran Package Manager module **gmsh-fpm allowing** for easy access to the API via Fortran

Load balancing for adaptive radiation transport simulations

London, UK

M.Sc. Thesis

Feb. 2018 – Sept. 2018

- Studied the use cases between spatial and angular discretisation methods e.g. FDM, FEM, FVM, DGFEM, S_n, P_n and wavelets
- Wrote a report on the application of global and goal based adaptive methods on transport problems
- Benchmarked, improved and optimised existing code in FETCH2 for load balancing of radiation transport problems

Investigating the transition from Molecular Dynamics to Smooth Particle Hydrodynamics

Egham, UK

B.Sc. Dissertation

Sept. 2016 – Apr. 2017

- Investigated the existence of a continuous transition between Molecular Dynamics (MD) and Smooth Particle Hydrodynamics (SPH) by creating computational models in C++ and Python
- Used Statistical Mechanics e.g. RDF, VAF, MSD, to make quantitative observations for the transition limits between the two models
- A continuous transition between MD and SPH was discovered, for the first time, for a small range of parameters of the pair potential

Publications

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