George Bisbas - Curriculum vitae

Work Address   **Permanent address**
William Penney Laboratory   —- —-
Department of Computing   London
Imperial College
Exhibition Road, London SW7 2AZ

PROFESSIONAL EXPERIENCE

Post-Doctoral Research Associate, Imperial College, London, UK   June 2023 – Now
XDSL/Devito Project
- Research on domain-specific languages, high-performance computing, compiler intermediate representations and automatic code generation. Active contributor and code reviewer.

Post-Doctoral Research Assistant, Imperial College, London, UK   May 2022 – June 2023
XDSL/Devito Project
- Research on domain-specific languages, high-performance computing, compiler intermediate representations and automatic code generation. Active contributor and code reviewer.

Researcher/Developer, Imperial College, London, UK   October 2018 – Now
Devito Project
- Research on high-performance computing, automatic code generation, loop nest optimizations, cache optimizations. Active contributor and code reviewer.

Research assistant, Aristotle University of Thessaloniki, Greece   November 2017 – October 2018
DigiPro Project
- Data optimization and visualization, integration and testing, dissemination. Developed efficient algorithms in MATLAB and C/Cilk code for point cloud simplification to create a novel, cost-efficient, portable solution for photo-realistic 3D digitization of rigid objects.

EDUCATION

October 2018 - March 2023

PhD, High Performance, Embedded and Distributed Systems
Department of Computing, Imperial College, London
Thesis title: Automated cache optimisations of stencil computations for partial
differential equations
PhD Thesis Supervisor: Professor Paul HJ Kelly in collaboration with Fabio Luporini and Gerard J. Gorman

March 2019

Master of Science, Intelligent Systems/Methods of computational Intelligence and applications
Aristotle University of Thessaloniki, Greece
Grade: 9.59/10 (Distinction)
Thesis: On developing and accelerating point cloud simplification methods
Thesis Supervisor: Professor Nikos P. Pitsianis

July 2017

Diploma of Engineering, Electrical and Computer Engineering
Aristotle University of Thessaloniki, Greece
Grade: 8.75/10 (Distinction)
Thesis: Forecast demand using Extended Discrete Fourier Transform
Thesis Supervisor: Professor Nikos P. Pitsianis

TEACHING EXPERIENCE

Imperial College, London, UK   Nov 2018 – October 2022
Graduate Teaching Assistant (Coursework preparation/Lecture support/Marking)
- (ACSE-6) Parallel Programming using the Message Passing Interface (MPI)   Jan 2021 - Mar 2021
- (COMP60001) Advanced Computer Architecture   Nov 2018 - Jan 2021
- Second Year Laboratory program (C++ Picture Processing/Pintos)   Nov 2018 - Jun 2019
- (COMP50006) Compilers   Jan 2021 - Jan 2022
- (COMP60017) Performance Engineering   Jan 2021 - Mar 2021
- (COMP40006) Reasoning about Programs   Jan 2021 - Mar 2021

PUBLICATIONS

Conference publications

- **George Bisbas**, Fabio Luporini, Mathias Louboutin, Rhodri Nelson, George Bisbas, Gerard Gorman, Paul H.J. Kelly. 2020. Temporal blocking of finite-difference stencil operators with sparse "off-the-grid" sources. (2020). 35th IEEE International Parallel & Distributed Processing Symposium. Available online: IEEEXplore

Talks and Presentations

- F. Luporini, M. Louboutin, R. Nelson, **G. Bisbas**, E. Caunt, P.H.J. Kelly, G. Gorman *The Devito DSL and Compiler Framework: From Symbolic PDEs to HPC Code*, Presented at PDE Simulations with High-Productivity Languages at the Dawn of Exascale MiniSymposium, SIAM CSE 2023 conference.
- **G. Bisbas**, F. Luporini, M. Louboutin, R. Nelson, G. Gorman, P.H.J. Kelly *Automated Temporal Blocking in the Devito Compiler*, Presented at Stencil Computation for Scientific Applications MiniSymposium, SIAM CSE 2023 conference.
- **G. Bisbas**, F. Luporini, M. Louboutin, R. Nelson, G. Gorman, P.H.J. Kelly *Temporal blocking for wave propagation with sparse off-the-grid sources* Presented at Rice Oil and Gas HPC (OGHPC 2021) conference.
- **G. Bisbas**, F. Luporini, M. Louboutin, R. Nelson, G. Gorman, P.H.J. Kelly *Temporal blocking of finite-difference stencil operators with sparse off-the-grid sources* Presented at 21st Workshop on Compilers for Parallel Computing (CPC21, Porto) conference.
- F. Luporini, R. Nelson, M. Louboutin, **G. Bisbas**, E. Caunt, G. Gorman *Devito: A DSL and compiler for automated generation of production-grade wave propagators*, Presented at Domain-Specific Languages in High-Performance Computing 2020.
- **G. Bisbas**, F. Luporini, M. Louboutin, R. Nelson, G. Gorman, P.H.J. Kelly *Temporal blocking of finite-difference stencil operators with sparse non-grid-aligned sources and receivers in Devito*, Presented at Domain-Specific Languages in High-Performance Computing 2020.
- F. Luporini, R. Nelson, M. Louboutin, N. Kukreja, **G. Bisbas**, P. Witte, Amik St-Cyr, C. Yount, T. Burgess, F. Herrmann, G. Gorman *Automatic Generation of Production-Grade Hybrid MPI-OpenMP Parallel Wave Propagators using Devito*, Presented at Platform for Advanced Scientific Computing (PASC 2019) Conference.

Poster Presentations

- **G. Bisbas**, F. Luporini, M. Louboutin, G. Gorman, P.H.J. Kelly *Accelerating real-world stencil computations using temporal blocking: handling sparse sources and receivers* Poster presented at the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2019).

In preparation/Submitted

- Mathias Louboutin, Fabio Luporini, Philipp Witte, Rhodri Nelson, **George Bisbas**, Jan Thorbecke, Felix J. Herrmann, and Gerard Gorman. 2020. Scaling through abstractions high-performance vectorial wave simulations for seismic inversion with Devito. (2020). arXiv:physics.comp-ph/2004.10519
- Rhodri Nelson, Fabio Luporini, Mathias Louboutin, **George Bisbas**, Gerard Gorman (2020). TheMatrix: An automated cross-platform benchmarking suite. Submitted to The Journal of Open Source Software, https://github.com/devitocodes/thematrix/blob/master/documents/thematrix-joss/paper.pdf

MISCELLANEOUS

Reviewing

Conferences
- International Conference on Parallel Processing (ICPP)
- PPoPP 2020 Artifact Evaluation Committee
- JupyterCon 2020 Proposal Community Review

Journals
- The Journal of Supercomputing, Springer
- Future Generation Computer Systems, Elsevier

Attended Events and Meetings

- Novel Architecture and Novel Design Automation (NANDA), 2023
- SIAM Conference on Computational Science and Engineering (CSE23), 2023
- International Summer School on HPC challenges in Computational Sciences, 2021
- IEEE International Parallel and Distributed Processing Symposium, 2021
- International Summer School on HPC challenges in Computational Sciences, 2020
- Rice Oil and Gas HPC Conference 2020, Houston TX, 02-04 March 2020
- Supercomputing Conference 2019, Denver CO, 17-22 November 2019
- The INTEL HPC Developer Conference 2019, Denver CO, 17-22 November 2019
- The 22nd European workshop on Automatic Differentiation (EuroAD), Imperial College London, 1-2 July 2019
- Numerical algorithms for high-performance computational science, The Royal Society London, 8-9 April 2019
- Drone School & Workshops: Deep learning and Computer vision for drone imaging and cinematography, August 2018
- Building blocks for the Internet of Things IoT-BB School", November 2017
- Blockchain: The new era, OpenMinds/CERTH-ITI, November 2017
- Seasonal School on Critical Infrastructure Security, June 2017
- Technology Circuit Co-Design for Sub-nm Low Power Design, Dr Rajiv Joshi, December 2016
- Challenges and Opportunities of Circuits and Systems on Internet of Things, Dr. Yen-Kuang Chen, October 2016
- S-CASE: Building your application's back-end in a blink of an eye!, July 2016
- Workshop on Modern Circuits and Systems Technologies (MOCAST), March 2014

COMPUTER SKILLS

Experienced in Python, C/C++, AVR Assembly, MIPS Assembly, Intel Cilk, MPI, OpenMP, OpenACC, R, LATEX, SVN, Git, Matlab, Intel Parallel Studio Tools (Advisor, VTune, ITaC)

Fairly good experience in CUDA, Microsoft Azure, Docker

Moderate experience in SPSS, CODESYS, SQL, Java, VHDL, Verilog, Cadence Encounter, ANSYS HFSS, Orcad PSpice, COMSOL Multiphysics

Limited experience in Simulink, HTML, PHP, CSS

Honours and awards

- Invited to ACM Student Research Competition and awarded the SRC Travel Award (500$)
- PhD student position, fully funded by a joint HiPEDS/DoC scholarship
- Member of the student team that was voted as the most valuable one in Cyber Physical Systems Course (HiPEDS PhD program)
- Scholarship for achieving the best grade in the 1st semester of MSc in Advanced Computer and Communication Systems (650 Euros)
- Eurobank monetary prize for excellence in Panhellenic exams (1000Euros), Issuer Eurobank Ergasias
- Member of the Greek team in Euroscola, Strasbourg, France , January 2011
- 3rd place in Prefecture of Larissas essay competition concerning "Water drought and clima changes", January 2009

PhD group projects

Cyber-Physical Systems group project (HiPEDS programme)   November 2018 – January 2019
- Path planning, constrained trajectory optimization, control, modeling, dynamic optimization and design improvement of concurrent real-time systems on INTECO's 3D crane.

Industry partner group project   October 2018
A 3-week project collaboration with Royal Mail Group Ltd
- Estimation of several point cloud features leading to an effective real time volume estimation under several time and cost constraints. Development of a fast and portable solution for real-time volume estimation.

Certifications on Online Courses, exams required
- Cryptography I by Stanford University on Coursera. Certificate earned on September 10, 2017
- UWashingtonX: CYB001x Introduction to Cybersecurity, edX, August 2017
- Grow Greek Tourism Online, Google

Certifications on Online Courses, no exams required

- Cryptography: Data and Application Security, Udemy, August 2017

- Cybersecurity Awareness Training, Udemy, August 2017

- Learn to Use HPC Systems and Supercomputers (Complete Guide), Udemy, August 2017

- Deep Learning Prerequisites: The Numpy Stack in Python, Udemy, August 2017

- Learn to Analyse Text Data in Bash Shell and Linux, Udemy, August 2017

- Introduction to Parallel Programming using GPGPU and CUDA, Udemy, October 2017

Organisations

- IEEE Student Member, #93014477 Greece Section

- ACM Student Member, #1563304

Service to my Department

- Coach and manager of Electrical and Computer Engineering Department football team 2016-17

- Member of the football team as a player from 2012-16 and 2017-18

References

Paul HJ Kelly
Faculty of Engineering, Department of Computing
Imperial College London
p.kelly@imperial.ac.uk ,+44 (0)20 7594 8332

Gerard Gorman
Faculty of Engineering, Department of Earth Science & Engineering
Imperial College London
g.gorman@imperial.ac.uk ,+44 (0)20 7594 9985

Nikos Pitsianis
Electrical and Computer Engineering
Aristotle University of Thessaloniki
Nikos.P.Pitsianis@Duke.edu ,+30 (2310) 994369