George Bisbas (Georgios Bismpas) - Curriculum vitae

Work Address
William Penney Laboratory
Department of Computing
Imperial College London
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—- —-
London

Find me online: – Imperial College Webpage – Linkedin profile

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. Contributor/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. Contributor/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

March 2023

PhD, High Performance, Embedded and Distributed Systems
Department of Computing, Imperial College, London
Thesis title: Automated cache optimizations of stencil computations for partial differential equations
Available online: https://doi.org/10.25560/105949
PhD Thesis Supervisor: Professor P. H.J. Kelly in collaboration with F. Luporini and G. 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
Available online (GR): https://ikee.lib.auth.gr/record/308235
Thesis Supervisor: Professor N. 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
Available online (GR): https://ikee.lib.auth.gr/record/292291
Thesis Supervisor: Professor N. 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

University College London, DIRAC High Performance Computing Facility Nov 2023

Department of Physics & Astronomy DiRAC Training Course Mentor 20 hours

- Foundation HPC-Skills course: FM01 Bash Shell: Using the Command Line (4 hours), FM02 Version Control with Git (4 hours), FM03 Principles of Software Engineering (4 hours), FM04 Testing, Documenting, and Reviewing Code (4 hours), FM05 Principles of Code Scaling (4 hours)

PUBLICATIONS

Conference publications

- **George Bisbas**, Rhodri Nelson, Mathias Louboutin, Fabio Luporini, Paul H.J. Kelly, Gerard Gorman (2024). Automated MPI-X code generation for scalable finite-difference solvers. [Accepted to IPDPS'25 - Available on Arxiv]
- **George Bisbas, Anton Lydike, Emilien Bauer, Nick Brown**, Mathieu Fehr, Lawrence Mitchell, Gabriel Rodriguez-Canal, Maurice Jameson, Paul H.J. Kelly, Michel Steuwer, Tobias Grosser (2023). A shared compilation stack for distributed-memory parallelism in stencil DSLs. (2024). In Proceedings of the 29th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, Volume 3 (ASPLOS '24), Vol. 3. Association for Computing Machinery, New York, NY, USA, 3856. [Paper available online]
- **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). In 35th IEEE International Parallel & Distributed Processing Symposium (IPDPS), Portland, OR, USA, 2021, pp. 497-506. [Paper available online]

Workshop publications

- Joao Speglich, Navjot Kukreja, **George Bisbas**, Atila Saraiva, Jan Hckelheim, Fabio Luporini, John Washbourne (2024). Optimizing wavefield storage with high-speed media. In ESSA'24, IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW) [Paper available online]

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). [Available on Arxiv]
- 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 [Available on Github]

Talks and Presentations

- **G. Bisbas**, A. Lydike, E. Bauer, N. Brown, M. Fehr, P. H.J. Kelly, T. Grosser *A shared compilation stack for distributed-memory parallelism in stencil DSLs. (2024). Presented at HiPeac 2025, Barcelona, Spain* [Slides]
- **G. Bisbas**, A. Lydike, E. Bauer, N. Brown, M. Fehr, P. H.J. Kelly, T. Grosser *A shared compilation stack for distributed-memory parallelism in stencil DSLs. (2024). Presented at 29th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '24)*
- **G. Bisbas**, A. Lydike, E. Bauer, N. Brown, M. Fehr, P. H.J. Kelly, T. Grosser *A shared compilation stack for HPC stencil DSLs*, Presented at PASC24, Minisymposium: Motif-Based Automated Performance Engineering for HPC. [Slides]
- 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. [Available: Youtube]
- **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. [Available: Youtube]
- **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. [Available: Youtube]
- 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, A. Lydike, E. Bauer, N. Brown**, M. Fehr, L. Mitchell, G. Rodriguez-Canal, M. Jameson, P. H.J. Kelly, M. Steuwer, T. Grosser *A shared compilation stack for distributed-memory parallelism in stencil DSLs* Poster presented at 29th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, Volume 3 (ASPLOS '24). [Poster]
- **G. Bisbas**, R. Nelson, M. Louboutin, F. Luporini, P. H.J. Kelly, G. Gorman *Automated MPI-X code generation for scalable finite-difference solvers* Poster referring to [Accepted to IPDPS'25 - Available on Arxiv]. [Poster]

- **G. Bisbas**, R. Nelson, M. Louboutin, P. H.J. Kelly, F. Luporini, G. Gorman *Automated MPI-X code generation for scalable finite-difference solvers* Poster presented at Rice Energy HPC 2024. [Poster]
- **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). [Poster]

Main contributions to open-source projects

- My merged PRs in https://github.com/devitocodes/devito
- Lead Maintainer/Developer in https://github.com/xdslproject/devito
- My merged PRs in https://github.com/xdslproject/xdsl

PEER REVIEWING

Conferences

- International Conference on Parallel Processing (ICPP 2024), Poster Committee Member
- Supercomputing 2024, Reproducibility committee (SC 24)
- JuliaCon Conference Proceedings
- International Workshop on Polyhedral Compilation Techniques (IMPACT 2024)
- International Conference on Parallel Processing (ICPP 2021)
- PPoPP 2020 Artifact Evaluation Committee
- JupyterCon 2020 Proposal Community Review

Journals

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

STUDENT SUPERVISION

MEng individual project

- **N. Duer**, *Temporal Tiling for Distributed Parallel Solution of Partial Differential Equations*, Department of Computing, Imperial College London, 2023, in collaboration with P. H.J. Kelly.[Thesis] Distinguished undergraduate project award 2022-2023.

Undergraduate research opportunity placements (UROPs)

Supervised a number of students on several projects. These projects included among others [Section under progress]:

- FD-Stencils on Cerebras

- FD-Stencils on Graphcore
- DSL for auto-code generation for CNNs
- Educational material for DSLs

MISCELLANEOUS

Attended Events and Meetings

- 3-day SYCL Hackathon, hosted by Dirac, Codeplay, and Intel, Edinburgh 2024
- Platform for Advanced Scientific Computing (PASC), 2024
- ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2024
- SIAM Conference on Parallel Processing (PP24), 2024
- 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 (IPDPS), 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

HPC skills: MPI, OpenMP, OpenACC, Intel Profiling Tools (Advisor, VTune, ITaC), Likwid, Cilk, Slurm, PBS, Nvidia Nsight, CUDA, SYCL Experienced in Python, C/C++, AVR Assembly, MIPS Assembly, R, LaTeX, SVN, Git, Matlab, Docker

Fairly good experience in Microsoft Azure

Moderate experience in MLIR, Julia, Java, SPSS, CODESYS, SQL, 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) Ergasias
- Member of the Greek team in Euroscola, Strasbourg, France , January 2011
- 3rd place in Prefecture of Larissa 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

- Workshop/Fundamentals of Deep Learning, earned on September 26, 2024 [Show credential]
- Workshop/Fundamentals of Accelerated Computing with CUDA C/C++, earned on June 26, 2024 [Show credential]
- Cryptography I by Stanford University on Coursera. Certificate earned on September 10, 2017 [Show credential]
- UWashingtonX: CYB001x Introduction to Cybersecurity, edX, August 2017 [Show credential]
- 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

- SIAM Early Career Membership, #020900949
- IEEE Student Member, #93014477 Greece Section
- ACM Professional Member, #1563304
- Technical Chamber of Greece, Member

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
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Gerard Gorman
Faculty of Engineering, Department of Earth Science & Engineering
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Electrical and Computer Engineering
Aristotle University of Thessaloniki
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