

Foivos Zakkak

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✉ foivos@zakkak.net

📄 foivos.zakkak.net

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Research Interests

- Virtual Machines
- Parallel Programming
- Energy Consumption Profiling
- Memory Management
- Compilers
- Power Modeling

Professional Experience

- July 2017 to present **Research Associate**, *The University of Manchester*, Manchester, UK.
- March 2017 to June 2017 **Research Software Engineer**, *The University of Manchester*, Manchester, UK.
- December 2016 to February 2017 **Postdoctoral Researcher**, *CARV, ICS-FORTH*, Heraklion, Crete, Greece.
- January 2013 to November 2016 **Graduate Research Assistant**, *CARV, ICS-FORTH*, Heraklion, Crete, Greece.
Design and implementation of a Java Virtual Machine for non-cache-coherent architectures.
- September 2012 to December 2012 **Intern**, *Vector Fabrics B.V.*, Eindhoven, North Brabant, The Netherlands.
Power modeling of multicore processors.
- November 2010 to August 2012 **Graduate Research Assistant**, *CARV, ICS-FORTH*, Heraklion, Crete, Greece.
Evaluation and optimization of task-based runtime systems and programming models. Mainly focusing on source-to-source transformations for performance optimization.
- November 2009 to November 2010 **Undergraduate Research Assistant**, *CARV, ICS-FORTH*, Heraklion, Crete, Greece.
Evaluation and optimization of task-based runtime systems and programming models. Mainly focusing on source-to-source transformations for performance optimization.
- February 2007 to November 2010 **Junior IT Systems Administrator**, *TSL, UoC*, Heraklion, Crete, Greece.
System administration, Deployment of new services etc.

Education

- March 2012 to November 2016 **Ph.D.**, *Computer Science Department, University Of Crete*, Heraklion, Crete, Greece.
(Excluding the winter semester of 2012-13)
- Thesis Topic: *JavaTM on Scalable Memory Architectures*
 - Supervisors: Polyvios Pratikakis and Angelos Bilas
- November 2010 to March 2012 **M.Sc.**, *Computer Science Department, University Of Crete*, Heraklion, Crete, Greece.
- Areas of Study:
 - Parallel and Distributed Systems
 - Computer Networks and Telecommunications
 - Thesis Topic: *SCOOP: Language extensions and compiler optimizations for task-based programming models*
 - Supervisor: Angelos Bilas
 - Co-Supervisor: Dimitrios S. Nikolopoulos
 - Co-Advisor: Polyvios Pratikakis

- October 2006 to November 2010 **B.Sc.**, *Computer Science Department, University Of Crete*, Heraklion, Crete, Greece.
- Thesis Topic: *C source level extensions and optimizations of parallelism on the Cell processor*
 - Supervisor: Angelos Bilas
 - Co-Advisor: Dimitrios S. Nikolopoulos
- July 2009 **Summer Session**, *Computer Science and Engineering, York University*, Toronto, Ontario, Canada.
- *Programming Language Fundamentals (CSE 3301 3.00A J2)*

Publications

Full Papers / Articles

James Clarkson, Juan Fumero, Machail Papadimitriou, **Foivos S. Zakkak**, Maria Xekalaki, Christos Kotselidis, and Mikel Luján. Exploiting High-Performance Heterogeneous Hardware for Java Programs using Graal. In *Proceedings of the 15th International Conference on Managed Languages and Runtimes*, ManLang 2018, New York, NY, USA, 2018. ACM.

Foivos S. Zakkak, Andy Nisbet, John Mawer, Tim Hartley, Nikos Foutris, Orion Papadakis, Andreas Andronikakis, Iain Apreotesei, and Christos Kotselidis. On the future of research VMs: a hardware/software perspective. In Stefan Marr and Jennifer B. Sartor, editors, *Conference Companion of the 2nd International Conference on Art, Science, and Engineering of Programming*, Nice, France, April 09-12, 2018, pages 51–53. ACM, 2018.

Christos Kotselidis, Andy Nisbet, **Foivos S. Zakkak**, and Nikos Foutris. Cross-isa debugging in meta-circular vms. In *Proceedings of the 9th ACM SIGPLAN International Workshop on Virtual Machines and Intermediate Languages*, VMIL 2017, pages 1–9, New York, NY, USA, 2017. ACM.

Colin Barrett, Christos Kotselidis, **Foivos S. Zakkak**, Nikos Foutris, and Mikel Luján. Experiences with building domain-specific compilation plugins in graal. In *Proceedings of the 14th International Conference on Managed Languages and Runtimes*, ManLang 2017, pages 73–84, New York, NY, USA, 2017. ACM.

Foivos S. Zakkak and Polyvios Pratikakis. Disquawk: 512 cores, 512 memories, 1 jvm. In *Proceedings of the 13th International Conference on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools*, PPPJ '16, pages 2:1–2:12, New York, NY, USA, 2016. ACM.

Foivos S. Zakkak and Polyvios Pratikakis. Building a java™ virtual machine for non-cache-coherent many-core architectures. In *Proceedings of the 14th International Workshop on Java Technologies for Real-Time and Embedded Systems*, JTRES '16, pages 1:1–1:10, New York, NY, USA, 2016. ACM.

Nikolaos Papakonstantinou, **Foivos S. Zakkak**, and Polyvios Pratikakis. Hierarchical parallel dynamic dependence analysis for recursively Task-Parallel programs. In *30th IEEE International Parallel & Distributed Processing Symposium (IEEE IPDPS 2016)*, Chicago, USA, May 2016. IEEE.

Foivos S. Zakkak and Polyvios Pratikakis. JDMM: A Java Memory Model for Non-cache-coherent Memory Architectures. In *Proceedings of the 2014 International Symposium on Memory Management*, ISMM '14, pages 83–92, New York, NY, USA, 2014. ACM.

Foivos S. Zakkak, Dimitrios Chasapis, Polyvios Pratikakis, Angelos Bilas, and Dimitrios S. Nikolopoulos. Inference and Declaration of Independence in Task-Parallel Programs. In *Proceedings of the 2013 International Conference on Advanced Parallel*

Processing Technology, volume 8299 of *APPT 2013*, pages 1–16. Springer Berlin Heidelberg, 2013.

Journals

Ioannis Manousakis, **Foivos S. Zakkak**, Polyvios Pratikakis, and Dimitrios S. Nikolopoulos. Tprof: An energy profiler for task-parallel programs. *Sustainable Computing: Informatics and Systems*, (0):–, 2014.

Short Papers / Extended Abstracts

Foivos S. Zakkak, Juan Fumero, and Christos Kotselidis. Enabling RISC-V support on MaxineVM. In *RISC-V Workshop*, pages 171–174. May 2018. Poster abstract.

Foivos S. Zakkak, Dimitrios Chasapis, Polyvios Pratikakis, Angelos Bilas, and Dimitrios S. Nikolopoulos. Inference and Declaration of Independence: Impact on Deterministic Task Parallelism. In *Proceedings of the 21st International Conference on Parallel Architectures and Compilation Techniques*, PACT '12, pages 453–454, New York, NY, USA, 2012. ACM.

Foivos S. Zakkak, Dimitrios Chasapis, Polyvios Pratikakis, Dimitrios S. Nikolopoulos, and Angelos Bilas. SCOOP: Source-level COmpiler Optimizations for Parallelism. In Koen De Bosschere, editor, *ACACES 2011 poster abstracts: July 13, 2011: Fiuggi, Italy*, pages 171–174. Academia Press, 2011.

PhD Thesis

Foivos S. Zakkak. *Java™ on Scalable Memory Architectures*. PhD thesis, Computer Science Department, University of Crete, October 2016.

Master's Thesis

Foivos S. Zakkak. SCOOP: Language extensions and compiler optimizations for task-based programming models. Master's thesis, Computer Science Department, University of Crete, March 2012. <http://elocus.lib.uoc.gr/dlib/3/a/3/metadata-dlib-1331627311-453362-1284.tkl>.

Technical Reports

Foivos S. Zakkak and Polyvios Pratikakis. DiSquawk: 512 cores, 512 memories, 1 JVM. Technical Report 470, ICS-FORTH, Jun 2016.

George Tzenakis, Angelos Papatriantafyllou, **Foivos S. Zakkak**, Hans Vandierendonck, Polyvios Pratikakis, and Dimitrios S. Nikolopoulos. BDDT: Block-level Dynamic Dependence Analysis for Deterministic Task-Based Parallelism. Technical Report 426, ICS-FORTH, Feb. 2012.

Awards

- 2015 My contributions to the question2answer open source platform were given an award from the Units of Excellence.
- 2014 In collaboration with Antonis Chariton we took the 2nd place for "Best solution for Crete" at the Hack4med hackathon

Peer Reviews

- JPDC 2012, 2014–15, 2017
- MULTIPROG 2014–15, 2018
- OPODIS 2015
- TRANSACT 2014
- Euro-Par 2013
- ACM TACO 2013
- PODC 2013
- TPDS 2013

Teaching Experience

Visiting Instructor,
University Of Crete



- CS 446 Managed Runtime Systems (Spring 2017)
 - Course design and implementation
 - Project assignment and supervision
 - Teaching and Marking

Teaching Assistant,
University Of Crete



- CS 100 Introduction to Computer Science (Winters 2011 and 2015–16)
 - Answering Students' questions on the mailing list
 - Marking assignments and examination scripts
- CS 120 Digital Design (Winter 2010)
 - Responsible for two 2 hour laboratories where undergraduate students learn the basics of digital design and implement a simple processor
 - Marking assignments and examination scripts
- CS 225 Computer Organization (Spring 2011)
 - Answering Students' questions on the mailing list
 - Marking assignments and examination scripts
- CS 240 Data Structures (Winters 2013–14)
 - Project co-design with the professor and another TA
 - Answering Students' questions about the project
 - Marking project submissions and examination scripts
- CS 255 Programming Lab (Springs 2012–16)
 - One 2-hour tutorial on GNU Make
 - Two 2-hour tutorials on GDB
 - One 1-hour tutorial on GIT
 - Answering Students' questions on the Moodle platform
 - Marking assignments and examination scripts