Antonios G. Danalis

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Research Interests

Parallel and Distributed Systems, Compilers, Operating Systems, Networks, Security.

Education

- **Ph.D.** in Computer & Information Sciences, University of Delaware, In progress.
  `Status`: ABD. Passed preliminary and qualifier exams, 2005
  `Thesis Subject`: ASPhALT: An Automatic System for Parallel Application Transformation.
  `Advisors`: Lori Pollock, Martin Swany.
- **M.Sc.** in Computer & Information Sciences, University of Delaware, Jun. 2003.
  `Research Area`: Network Monitoring (*http://www.cis.udel.edu/~danalis/ANeMoS.html*).
  `Thesis subject`: ANeMoS, an Autonomous Network Monitoring System.
  `Advisor`: Constantinos Dovrolis.
- **M.Sc.** in Computer Science, University of Crete, Greece, Jun. 2001.
  `Research Areas`: Wormhole IP over ATM (*www.ics.forth.gr/carv/r-d-activities/wormholeIP/*), Web Cashing, Cache performance profiling (*www.ics.forth.gr/carv/r-d-activities/cachePer/*).
  `Thesis subject`: Design and implementation of a firewall for the embedded platform IXP1200.
  `Advisor`: Evangelos Markatos.
- **B.Sc.** in Physics, University of Crete, Greece, Sep. 1999.

Professional Experience

- Research assistant with Prof. L. Pollock and M. Swany. University of Delaware. *Sep 2006 -*
- Research Intern, Oak Ridge National Laboratory. *Jun 2006 - Aug 2006*
- Research assistant with Prof. L. Pollock and M. Swany. University of Delaware. *Sep 2005 - May 2006*
- Engineering Intern, Google Inc. *Jun 2005 - Aug 2005*
- Research assistant with Prof. Lori Pollock. University of Delaware. *Jun 2003 - May 2005*
- Teaching assistant. University of Delaware. *Sep 2002 - May 2003*
- Research assistant with Prof. Constantinos Dovrolis. University of Delaware. *Jan 2002 - Aug 2002*
- Teaching assistant. University of Delaware. *Sep 2001 - Dec 2001*
- Research assistant, Operating Systems and HPCN, Institute of Computer Science, FORTH, Greece (*http://www.ics.forth.gr*). *Sep 1999 - Jun 2001*
- Teaching assistant. University of Crete. *Sep 1999 - Jun 2001*
- Software Engineer, Form Flow automation of Cretan Cooperative Bank. *Aug 2000 - Feb 2001*
- Software Engineer, Distance learning project funded by the European Union. *Jan 1998 - Jul 2000*
- System & Network Administrator, Computer Center, University of Crete. *Sep 1995 - Dec 1997*

Publications

◦ Refereed Publications

- A. Danalis, L. Pollock and M. Swany, "Gravel: a communication library to fast path MPI", To appear in *EuroPVM/MPI*, Dublin, Ireland, September 2008.
- A. Danalis, L. Pollock, M. Swany and J. Cavazos, "Implementing an Open64-based Tool for Improving the Performance of MPI Programs", In the *Open64 Workshop, in conjunction with IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, Boston, MA, USA, April 2008.
- A. Danalis, L. Pollock and M. Swany, "Introducing Gravel: An MPI Companion Library", In the *Next Generation Software Workshop (NGS '08), in conjunction with the 22th International Parallel and Distributed Processing Symposium (IPDPS '08)*, Miami, FL, USA April 2008.
- A. Danalis, L. Pollock and M. Swany, "Automatic MPI application transformation with ASPhALT", In the *Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL 2007), in conjunction with the 21th International Parallel and Distributed Processing Symposium (IPDPS '07)*, Long Beach, CA, USA, March 2007.
- A. Danalis, L. Pollock, M. Swany, "An Automatic System for Parallel Application Transformation", In the *Commodity Cluster Symposium, (CCS)*, June 2006.
- A. Danalis, K. Y. Kim, L. Pollock and M. Swany, "Transformations to Parallel Codes for Communication-Computation Overlap", In the *ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (SC05)*, Seattle, WA, November, 2005 (acceptance rate 24%).
- L. Fishgold, A. Danalis, L. Pollock and M. Swany, "An Automated Approach to Improving Communication-Computation Overlap in Clusters", In *Parallel Computing (ParCo '05)*, Malaga, Spain, Sep. 2005.
- A. Danalis, "Web Caching". In the *Encyclopedia of Information Science and Technology*, ISBN: 1-59140-553-X, 2005.
- B. Breech, A. Danalis, S. Shindo, and L. Pollock, "Online Impact Analysis via Dynamic Compilation Technology". In the *International Conference on Software Maintenance (ICSM)*, Sept. 2004.
- A. Danalis, C. Dovrolis, "ANeMoS: An Autonomous NEtwork MOnitoring System". In the *Passive and Active Measurement Workshop (PAM'03)*, San Diego, CA, 2003.
- A. Danalis, E. P. Markatos, "Web Caching". In *Enterprise Networking: Multilayer Switching and Applications*, pp. 383–408, ISBN: 1930708173, 2001.

◦ Non-Referred Publications

- A. Danalis, L. Pollock and M. Swany, "Automatic MPI application transformation with ASPhALT", In the *NSF Next Generation Software Program Workshop (NSFNGS), in conjunction with the 21th International Parallel and Distributed Processing Symposium (IPDPS '07)*, Long Beach, California USA, Mar. 2007.
- L. Fishgold, A. Danalis, L. Pollock and M. Swany, "An Automated Approach to Improving Communication-Computation Overlap in Clusters", In the *NSF Next Generation Software Program Workshop (NSFNGS), in conjunction with the 20th International Parallel and Distributed Processing Symposium (IPDPS '06)*, Rhodes, Greece, Apr. 2006.
- A. Danalis, K. Y. Kim, L. Pollock and M. Swany, "Transformations to Parallel Codes for Communication-Computation Overlap", *Technical Report 2005-12, Department of Computer and Information Sciences, University of Delaware*, February 2005.
- A. Danalis, "ANeMoS: An Autonomous Network Monitoring System", *M.Sc. Thesis, Computer and Information Science Dept. University of Delaware*, June 2003.
- A. Danalis, "Firewall development for the embedded network processor IXP1200", *M.Sc. Thesis, Computer Science Dept. University of Crete, Greece*, June 2001.

Funding

Contributed substantial technical content & writing of a successful National Science Foundation (NSF) research grant proposal. "CSR-AES: An Integrated Approach to Improving Communication Performance in Clusters". Co-PIs: Martin Swany, Lori Pollock. Proposal for $350,000, Jul 2005, funded.

Oral Presentations

- "Implementing an Open64-based Tool for Improving the Performance of MPI Programs", *Open64 Workshop, in conjunction with CGO*, Boston, MA, USA, April 2008.
- "Using Open64 for source to source transformations', *Tech. transfer talk, Oak Ridge National Laboratory*, Oak Ridge, TN, August 2006.
- "ASPhALT: an Automatic System for Parallel AppLication Transformation", *Intern Presentation of PhD topic, Oak Ridge National Laboratory*, Oak Ridge, TN, July 2006.
- "An Automated Approach to Improving Communication-Computation Overlap in Clusters", *NSF Next Generation Software Program Workshop (NSFNGS)*, Rhodes, Greece, Apr. 2006.
- "Transformations to Parallel Codes for Communication-Computation Overlap", *UD Computational Science Day*, Newark, DE, February, 2006.
- "Transformations to Parallel Codes for Communication-Computation Overlap", *ACM/IEEE SC05*, Seattle, WA, November, 2005.
- "An Automated Approach to Improving Communication-Computation Overlap in Clusters", *Parallel Computing '05*, Malaga, Spain, September, 2005.
- "Kiwi: A Vertically Integrated Approach to Improving Communication Performance in Clusters", *Intern Presentation of PhD topic, Google Inc.*, Los Angeles, CA, July, 2005.
- "Asynchronous I/O with MPI", *Special Interest Group in High Performance Computing, University of Delaware*, Newark, DE, November, 2004.
- "Using MPI's Asynchronous I/O", *Guest lecture CIS-372 Parallel Programming, University of Delaware*, Newark, DE, October, 2004.
- "Transformations for hiding communication latency in parallel programs", *Special Interest Group in Program Analysis and Compilation Techniques*, Newark, DE, March, 2004.
- "Adaptive Optimization Systems", *Special Interest Group in Program Analysis and Compilation Techniques*, Newark, DE, October, 2003.
- "ANeMoS: An Autonomous NEtwork MOnitoring System", *PAM*, San Diego, CA, April, 2003.

Teaching Experience

Teaching Assistant:
Responsible for grading assignments, testing student projects, and holding weekly office hours.

- CISC672: Advanced Compiler Construction (graduate level), University of Delaware, Spring 2003. *Also responsible for holding lectures at the request of the professor.*
- CISC663: Operating Systems (graduate level), University of Delaware, Spring 2003. *Also responsible for grading midterm and final exams.*
- CISC220: Data structures, University of Delaware, Fall 2002.
- CS553: Parallel Programming (graduate level), University of Crete, Fall 1999. *Also responsible for grading midterm and final exams, and holding lectures at the request of the professor.*

- CS100: C Programming, University of Crete, Spring 2000 and Spring 2001. *Also responsible for grading midterm and final exams, and holding lectures at the request of the professor.*

Laboratory Instructor:
Responsible for leading four lab sessions a week, meeting with students during office hours and grading labs in C++ programming.

- CISC181: Introduction to Computer Science, University of Delaware, Fall 2001.

Selected Projects

- Design and implementation of `Gravel`, an MPI companion library that enables advanced use of RDMA in parallel applications. Implementation on top of `uDAPL`.
- Design and implementation of benchmarks to capture the communication-computation overlapping capabilities of a cluster, in `C` (work in progress).
- Design and implementation of a program analysis and transformation phase over `Open64` (work in progress).
- Implementation of a library to make `Myrinet GM` usable from `Fortran 90`.
- Experimental modifications of `Jikes RVM` to perform on-line impact analysis.
- Design and implementation of parallel algorithms for pattern discovery, in `C` (using `Cilk` and `MPI`).
- Modifications of the Linux kernel to use compiler information for optimizing context switching.
- Design and implementation of an intelligent distributed system for autonomous network monitoring, in `Java` (*http://www.cis.udel.edu/~danalis/ANeMoS.html*).
- Implementation of a compiler for the OO language COOL, in `Java`.
- Implementation of a network bandwidth estimation tool, based on TCP bulk transfer rate, in `C`.
- Design and implementation of a distributed virtual University, in `Java` (using `Corba`).
- Design and prototype implementation of a Secure and Private Electronic Transactions Protocol, in `Java`.

Honors and Awards

Dean's List, College of Arts and Science, University of Delaware, Spring 2004

Service & Leadership

- *Mentor*, two UDel undergraduate students, 2006-present
- *Mentor*, two UDel senior research honors theses, 2004-2005
- *Webmaster*, Mid-Atlantic Student Workshop on Programming Languages and Systems
- *Reviewer*, for HPDC 2006, SC|06, PLDI 2007 and ICS 2008.

References

Available on request.