

# Dr. Michail D. Flouris

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## Research Interests & Expertise

<b>Computer Systems.</b>	Operating Systems Functionality & Performance (Scheduling, Memory Hierachy, I/O, File systems and Networking), Embedded Systems and Computer Architecture.
<b>Storage Systems</b>	Storage Management, Scalability & Reliability, File systems, Storage Networks & Protocols, Virtualization, Autonomous Storage, and Scalable Enterprise-class Storage Systems using Commodity Components.
<b>Distributed and Parallel Computing.</b>	Resource allocation and management in Clusters, Grids or Clouds, Network RAM, Parallel/Cluster Operating Systems and I/O, Availability & and Fault-tolerance, Parallel Algorithms & Programming.
<b>Systems Programming</b>	System-level Programming, Analysis and Optimization.
<b>Internet Performance</b>	Web Performance, Web Caching and Prefetching.

## Education

- Ph.D.** (2009) Department of Computer Science, University of Toronto, Canada.  
Thesis: "Extensible Networked-Storage Virtualization with  
Metadata Management at the Block Level"
- M.Sc.** (2000) Computer Science Department, University of Crete, Greece.  
Thesis: "Design & Implementation of Methods Enchancing the  
Performance of WWW Proxies".
- B.Sc.** (1998) Department of Mathematics, University of Crete, Greece.

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## Publications

(categorized and in reverse chronological order)

### ◇ Journal Papers

1. Michail D. Flouris, Renaud Lachaize, Konstantinos Chasapis, and Angelos Bilas: “*Extensible block-level storage virtualization in cluster-based systems*”. In Journal of Parallel and Distributed Computing (JPDC), Volume 70, Issue 5, May 2010. URL: <http://dx.doi.org/10.1016/j.jpdc.2010.03.001>
2. Evangelos P. Markatos, Dionisios N. Pnevmatikatos, Michail D. Flouris, and Manolis G.H. Katevenis: “*Web-Conscious Storage Management for Web Proxies*”. In IEEE/ACM Transactions on Networking (TON), December 2002, Volume 10, Number 6, pp. 735-748.
3. Michail D. Flouris and Evangelos P. Markatos, “*The Network RamDisk: Using Remote Memory on Heterogeneous NOWs*”. In Cluster Computing, Special Issue on I/O in Shared-Storage Clusters, 2(4), pp. 281-293, 1999, Baltzer Science Publishers. URL: <http://www.baltzer.nl/cluster/cluster.asp>

### ◇ Refereed Conference & Workshop Papers

1. Markos Fountoulakis, Manolis Marazakis, Michail D. Flouris and Angelos Bilas: “*Design and Evaluation of an I/O Controller for Data Protection*”, In the 3rd Annual Haifa Experimental Systems Conference (SYSTOR 2010), May 24-26, 2010, Haifa, Israel.
2. Thanos Makatos, Yannis Klonatos, Manolis Marazakis, Michail D. Flouris and Angelos Bilas: “*Using Transparent Compression at the Block Level to Increase Storage Space Efficiency*”, In the 6th IEEE International Workshop on Storage Network Architecture and Parallel I/Os (SNAPI '10), May 3rd, 2010 at Lake Tahoe, Incline Village, NV, USA. [in conjunction with the 26th IEEE Conference on Mass Storage Systems and Technologies (MSST 2010)].
3. Thanos Makatos, Yannis Klonatos, Manolis Marazakis, Michail D. Flouris, Angelos Bilas: “*Using Transparent Compression to Improve SSD-based I/O Caches*”, In the ACM/SIGOPS European Conference on Computer Systems (EuroSys 2010), April 13-16, 2010, Paris, France.
4. George Panagiotakis, Michail D. Flouris and Angelos Bilas: “*Reducing Disk I/O Performance Sensitivity for Large Numbers of Sequential Streams*”. In the 29<sup>th</sup> International Conference on Distributed Computing Systems (ICDCS 2009), June 22-26, 2009, Montreal, Quebec, Canada.

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5. Jesus Luna, Michail Flouris, Manolis Marazakis, Angelos Bilas, Marios D. Dikaiakos, Harald Gjermundrod, Theodoros Kyprianou: “*Using the gLite middleware to implement a secure Intensive Care Grid System*”. In “Grid and Services Evolution”, CoreGRID series, Springer Verlag, 2009. (ISBN: 978-0-387-85965-1)
  6. Maciej Brzezniak, Norbert Meyer, Michail Flouris, and Angelos Bilas: “*Practical evaluation of custom technology-based vs commodity technology-based Storage Elements*”. In “Grid and Services Evolution”, CoreGRID series, Springer Verlag, 2009. (ISBN: 978-0-387-85965-1)
  7. Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Orchestra: Extensible Block-level Support for Resource and Data Sharing in Networked Storage Systems*”. In the 14th IEEE International Conference on Parallel and Distributed Systems (ICPADS 2008), 8-10 Dec. 2008.
  8. Jesus Luna, Michail Flouris, Manolis Marazakis and Angelos Bilas: “*Providing Security to the Desktop Data Grid*”. In the 2nd Workshop on Desktop Grids and Volunteer Computing Systems (PCGrid '08), April 2008, Miami, Florida, USA (in Proceedings of the 2008 IEEE International Parallel & Distributed Processing Symposium (IPDPS '08), pages 1-8, ISBN: 978-1-4244-1693-6). (Also published as CoreGRID technical report TR-0145)
  9. Jesus Luna, Michail Flouris, Manolis Marazakis, Angelos Bilas, Marios D. Dikaiakos, Harald Gjermundrod, Theodoros Kyprianou: “*A Data-Centric Security Analysis of ICGrid*”. In Proceedings of the CoreGRID Integrated Research in Grid Computing, pages 165-176, April 2008. (Also published as CoreGRID technical report TR-0144)
  10. Jesus Luna, Michail Flouris, Manolis Marazakis, Angelos Bilas, Federico Stagni, Alberto Forti, Antonia Ghiselli, Luca Magnoni and Riccardo Zappi: “*An Analysis of Security Services in Grid Storage Systems*”. In “Grid Middleware and Services: Challenges and Solutions”, CoreGRID series, Springer Verlag, August 2008. (ISBN: 978-0-387-78445-8) (Also published as CoreGRID technical report TR-0090)
  11. Maciej Brzezniak, Norbert Meyer, Michail Flouris, Renaud Lachaiz, and Angelos Bilas: “*An Analysis of GRID Storage Element Architectures: High-end Fiber-Channel vs. Emerging Cluster-based Networked Storage*”. In “Grid Middleware and Services : Challenges and Solutions”, CoreGRID series, Springer Verlag, August 2008. (ISBN: 978-0-387-78445-8)
  12. Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Violin: A Framework for Extensible Block-level Storage*”. In “Knowledge and Data Management in Grids”,

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CoreGRID series, Vol. 3, Springer Verlag, 2007.

13. Zsolt Nemeth, Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Conductor: Support for Autonomous Configuration of Storage Systems*”. In “Knowledge and Data Management in Grids”, CoreGRID series, Vol. 3, Springer Verlag, 2007.
14. Zsolt Nemeth, Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Support for Automatic Diagnosis and Dynamic Configuration of Scalable Storage Systems*”. In CoreGrid Workshop on Grid Middleware in conjunction with EuroPar’06, Springer Verlag, 2006.
15. Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Using Lightweight Transactions and Snapshots for Fault-Tolerant Services Based on Shared Storage Bricks*”. In International Workshop on High Performance I/O Techniques and Deployment of Very Large Scale I/O Systems (HiperIO ’06), Sept. 2006 (In conjunction with IEEE Cluster 2006).
16. Michail D. Flouris, Stergios V. Anastasiadis and Angelos Bilas: “*Block-level Virtualization: How far can we go?*”. In IEEE-CS International Symposium on Global Data Interoperability - Challenges and Technologies, June 20-24, 2005, Sardinia, Italy.
17. Michail D. Flouris and Angelos Bilas: “*Violin: A Framework for Extensible Block-level Storage*”. In 22nd IEEE / 13th NASA Goddard Conference on Mass Storage Systems and Technologies (MSST2005), April 11-14, 2005, Monterey, California USA.
18. Dimitrios Xinidis, Michail D. Flouris and Angelos Bilas: “*Performance Evaluation of Commodity iSCSI-based Storage Systems*”. In 22nd IEEE / 13th NASA Goddard Conference on Mass Storage Systems and Technologies (MSST2005), April 11-14, 2005, Monterey, California USA.
19. Dimitrios Xinidis, Michail D. Flouris and Angelos Bilas: “*Virtual Timers: Using Hardware Physical Timers for Profiling Kernel Code-Paths*”. In 8th Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-8), (immediately preceding the 11th International Symposium on High Performance Computer Architecture (HPCA-11)), February 12, 2005, San Francisco, California, USA.
20. Michail D. Flouris and Angelos Bilas: “*Clotho: Transparent Data Versioning at the Block I/O Level*”. In NASA/IEEE Conference on Mass Storage Systems and Technologies (MSST2004), 13-16 April 2004, College Park, MD, USA.
21. Michail Flouris, Lap Chi Lau, Tsuyoshi Morioka, Periklis A. Papakonstantinou and Gerald Penn, “*Bounded and Ordered Satisfiability: Connecting Recognition with*

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*Lambek-style Calculi to Classical Satisfiability Testing*".

In Mathematics of Language 8 (MoL 8), 20-22 June 2003, Bloomington, IN, USA.

22. Evangelos P. Markatos, Manolis G.H. Katevenis, Dionisis Pnevmatikatos, and Michail D. Flouris, "*Secondary Storage Management for Web Proxies*", 2nd Symposium on Internet Technologies & Systems (USITS '99), October 11-14, 1999, Boulder, Colorado, USA.

URL: [http://archvlsi.ics.forth.gr/OS/html\\_papers/USITS99/paper.html](http://archvlsi.ics.forth.gr/OS/html_papers/USITS99/paper.html)

◇ **Invited Book Chapters**

1. Michail D. Flouris, and Evangelos P. Markatos, "*Network RAM*", In High Performance Cluster Computing, Vol 1, editor Buyya Rajkumar, Prentice Hall, USA, ISBN 0-13-013784-7.

URL: <http://vig.prenhall.com/acadbook/0,2581,0130137847,00.html>

◇ **Tutorials (Refereed)**

1. Manolis Marazakis, Michail D. Flouris, and Angelos Bilas: "*Storage Virtualization and High-Performance I/O: Storage I/O Stack Design and Implementation*". Tutorial in the ACM/SIGOPS European Conference on Computer Systems (EuroSys 2010), Apr 13-16, 2010, Paris, France.

◇ **Refereed Posters, Work-in-proress & Short Papers**

1. Markos Fountoulakis, Manolis Marazakis, Michail D. Flouris and Angelos Bilas: "*A high performance commodity I/O controller for storage virtualization*", Poster in the ACM/SIGOPS European Conference on Computer Systems (EuroSys 2010), April 2010. URL: [http://eurosyst2010.sigops-france.fr/poster\\_demo/eurosyst2010-final21.pdf](http://eurosyst2010.sigops-france.fr/poster_demo/eurosyst2010-final21.pdf)
2. Michail D. Flouris, Renaud Lachaize, Kostas Magoutis, and Angelos Bilas, "*RIBD: Recoverable Independent Block Devices*". Work-in-progress paper in the 2009 ACM/SIGOPS European Conference on Computer Systems (EuroSys 2009).
3. Thanos Makatos, Manolis Marazakis, Michail D. Flouris, Kostas Magoutis, and Angelos Bilas, "*Improving Online Storage Space Efficiency Using Transparent Block-level Compression*". Poster in the 2009 ACM/SIGOPS European Conference on Computer Systems (EuroSys 2009).
4. Yannis Klonatos, Michail D. Flouris, Manolis Marazakis, and Angelos Bilas "*Using NAND-based Flash SSDs as a storage cache*". Poster in the 2009 ACM/SIGOPS European Conference on Computer Systems (EuroSys 2009).

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5. Michail D. Flouris and Evangelos P. Markatos, “*The Network RamDisk: Using Remote Memory on Heterogeneous NOWs*”. Poster paper in the Work-in-progress Session of the USENIX ’99 Annual Technical Conference, June 6-11 1999, Monterey, CA, USA.

◇ **Technical Reports & Theses**

1. Maciej Brzezniak, Norbert Meyer, Michail Flouris, and Angelos Bilas: “*Practical evaluation of custom technology-based vs commodity technology-based Storage Elements*”. CoreGrid Technical Report TR-0168, July 2008.
2. Jesus Luna, Michail Flouris, Manolis Marazakis, Angelos Bilas, Federico Stagni, Alberto Forti, Antonia Ghiselli, Luca Magnoni, and Riccardo Zappi: “*An Analysis of Security Services in Grid Storage Systems*”, CoreGrid Technical Report TR-0090, August 2007.
3. Michail D. Flouris, Renaud Lachaize and Angelos Bilas: “*Shared & Flexible Block I/O for Cluster-Based Storage*”, Technical Report 380, July 2006, Institute of Computer Science, FORTH, Greece.
4. Michail D. Flouris and Angelos Bilas: “*Violin: A Framework for Extensible Block-level Storage*”, Technical Report 344, Oct. 2004, Institute of Computer Science, FORTH, Greece.
5. Michail D. Flouris and Angelos Bilas: “*Clotho: Transparent Data Versioning at the Block I/O Level*”, Technical Report 326, Oct. 2003, Institute of Computer Science, FORTH, Greece.
6. Evangelos P. Markatos, Dionisios N. Pnevmatikatos, Michail D. Flouris, and Manolis G.H. Katevenis: “*Web-Conscious Storage Management for Web Proxies*”, Technical Report 275, Aug. 2000, Institute of Computer Science, FORTH, Greece.  
URL: [http://archvlsi.ics.forth.gr/papers/2000.TR275.Web-Conscious\\_Storage\\_Management\\_Web-Proxies.ps.gz](http://archvlsi.ics.forth.gr/papers/2000.TR275.Web-Conscious_Storage_Management_Web-Proxies.ps.gz)
7. Michail D. Flouris, “*Design and Implementation of Methods Enhancing the Performance of WWW Proxies*”. M.Sc. Thesis, Computer Science Department, University of Crete, Greece, February 2000.
8. Michail D. Flouris and Evangelos P. Markatos, “*The Network RamDisk: Using Remote Memory on Heterogeneous NOWs*”, Tech. Report 226, FORTH, Aug. 1998.  
URL: [http://archvlsi.ics.forth.gr/OS/html\\_papers/TR226/nrd.html](http://archvlsi.ics.forth.gr/OS/html_papers/TR226/nrd.html)

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## Work Experience

- ◇ (*Dec. 2007 - present*) : With the **Scalable Systems and Networks** Laboratory at the Institute of Computer Science, Foundation for Research & Technology - Hellas (FORTH), as a Research Associate. (URL: <http://www.ics.forth.gr/carv/scalable/>)

Projects worked on:

- ▷ *STREAM*: Scalable Autonomic Streaming Middleware for Real-Time Processing of Massive Flows of Data, funded by the EC FP7 program.

- ◇ (*June 2003 - Aug. 2006 & March 2007 - Nov. 2007*) : With the **Scalable Systems and Networks** Laboratory at the Institute of Computer Science, FORTH, as a Research Assistant and R & D Engineer. (URL: <http://www.ics.forth.gr/carv/scalable/>)

Projects worked on:

- ▷ *SIVSS*: Scalable Intelligent Video Server System, funded by the EC FP6 program.
- ▷ *CoreGRID*: European Research Network on Foundations, Software Infrastructures and Applications for large scale distributed, Grid and Peer-to-Peer Technologies, funded by the EC FP6 program.
- ▷ *UNISIX*: Unifying System Interconnects, Marie Curie Excellent Teams Award (Contract No. MEXT-CT-2003-509595), funded by the EC FP6 program.

- ◇ (*Sept. 2000 - Jan. 2003*) : Research and Teaching Assistant in the Department of Computer Science, University of Toronto, Canada.

- ◇ (*June 1996 - August 2000*) : With the **Operating Systems and HPCN Group** in the Computer Architecture & VLSI Division of the Institute of Computer Science at FORTH, as a Research Assistant and R & D Engineer. (URL: <http://archvlsi.ics.forth.gr/OS/>)

- ◇ (*September 1999 - June 2000*) : With the **Center of Communications and Networks** of the University of Crete, as an Information System's Developer.

- ◇ (*June 1995 - June 1996*) : With the System Support Team in the Institute of Computer Science - Foundation for Research & Technology - Hellas (FORTH), as a Systems Administrator.

- ◇ (*January 1994 - June 1995*) : With the **Computer Center** of the University of Crete, as a System Support Assistant.

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## Teaching Experience

- ◇ *Fall 2002* : Teaching Assistant for:
  - (i) “**CSC 468F: Operating Systems**”, taught by Prof. Angela Demke-Brown at the Dept. of Computer Science, University of Toronto.
  - (ii) “**CSCC09F: Programming on the Web**”, taught by Prof. Alan Rosselet at the University of Toronto at Scarborough.
- ◇ *Winter 2002 & Summer 2002* : Teaching Assistant for “**CSC-340: Information Systems Analysis & Design**”, taught by Prof. Mylopoulos at the Dept. of Computer Science, University of Toronto.
- ◇ *Fall 2001* : Teaching Assistant for “**CSC-468: Operating Systems**”, taught by Prof. G. Scott Graham at the Dept. of Computer Science, University of Toronto.
- ◇ *Spring 2001* : Teaching Assistant for the undergraduate course “**CSC-354: Computer Based Simulation Models**”, taught by Prof. G. Scott Graham at the Dept. of Computer Science, University of Toronto.
- ◇ *Spring 2000* : Teaching Assistant for “**CS-140: Programming**”, taught by Prof. Evangelos Markatos at the Computer Science Department of the University of Crete.
- ◇ *Fall 1999* : Teaching Assistant for “**CS-354: Operating Systems**”, taught by Prof. Evangelos Markatos at the Computer Science Department of the University of Crete.
- ◇ *Spring 1999* : Instructor at a Post-secondary Education Institute. Courses taught: “**Multimedia Systems**” and “**Application Development in Windows**”.
- ◇ *Spring 1999* : Teaching Assistant for the graduate course “**CS-527: Parallel Systems Architecture**”, taught by Prof. Dionisios Pnevmatikatos at the Computer Science Department of the University of Crete.
- ◇ *Fall 1998* : Teaching Assistant for the graduate course “**CS-543: Parallel Programming**”, taught by Prof. Evangelos Markatos at the Computer Science Department of the University of Crete.
- ◇ *Spring 1998* : Teaching Assistant for “**CS-100: Introduction to Computer Science**”, taught by Prof. Kamboureli at the Biology Department of the University of Crete.

## Conference Committees

- ◇ Program Committee Member in Coregrid WP2 Workshop, 2005, Poznan, Poland.

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- ◇ Member of Shadow Program Committee in the ACM/SIGOPS European Conference on Computer Systems (EuroSys 2010), April 13-16, 2010, Paris, France.  
URL: [http://eurosys2010.sigops-france.fr/shadow\\_pc.html](http://eurosys2010.sigops-france.fr/shadow_pc.html)

## **Reviewer Experience**

- ◇ Reviewer for many major conferences and journals including:
  - IEEE TC (IEEE Transactions on Computers),
  - IEEE HPCA (International Symposium on High-Performance Computer Architecture),
  - IEEE International Conference on Cluster Computing (IEEE Cluster),
  - ICS (ACM International Conference on Supercomputing),
  - ICDCS (International Conference on Distributed Computing Systems),
  - IPDPS (IEEE International Parallel & Distributed Processing Symposium),
  - TPDS (IEEE Transactions on Parallel and Distributed Systems),
  - NAS (IEEE International Conference on Networking, Architecture & Storage)
  - WWW (ACM and IW3C World Wide Web Conference),
  - IEEE SCC (IEEE International Conference on Services Computing),
  - HiPC (International Conference on High Performance Computing),
  - CCGrid (Cluster Computing and Grid),
  - Wireless Communications and Mobile Computing (WCMC) Journal,
  - PCI (Panhellenic Conference on Informatics),
  - European Workshop on System Security (EuroSec),
  - European Conference on Parallel and Distributed Computing (Euro-Par)
- ◇ Session Chair in the following conferences:
  - ICDCS 2009 (International Conference on Distributed Computing Systems)