George Amvrosiadis

B.Sc., Ph.D. Candidate $\sim$ ACM, IEEE, Usenix Member

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RESEARCH OBJECTIVE

We have transitioned to an era where data plays an integral role in business continuity, and data analytics is often used to inform research and development practices. In this context, storage systems are faced with multiple tasks trying to access the same large body of data, either for data analytics, or to perform maintenance operations that will ensure data reliability, availability, performance, and security. Such tasks may range from MapReduce jobs to backup, virus scanning, and layout reorganization, among others. My current research objective is to understand how these tasks operate in the field, and enable them to collaborate by adjusting their data access patterns in a manner reactive to other tasks running in the system. This way, they can leverage data availability in system caches, and collectively reduce the I/O needed to reach their goals, which in turn reduces their runtime.

My **research interests** lie in the areas of Storage Reliability and Performance, File Systems, Operating and Distributed Systems, Systems modeling and simulation, Databases, and Networks.

EDUCATION

SEPT. 2009 - PRESENT	**Doctor of Philosophy** in Computer Science, **University of Toronto**, Canada Area: Storage Performance and Reliability, Computer Systems & Networks CURRENT GPA: A · Advisors: Prof. Angela DEMKE-BROWN, Prof. Ashvin GOEL
SEPT. 2005 - JULY 2009	**Bachelor of Science** in Computer Science, **University of Ioannina**, Greece Thesis: "Namespace Management in Federated Filesystems" · Advisor: Prof. Stergios ANASTASIADIS My undergraduate thesis [4] focused on designing and evaluating flexible namespace management for federated file systems. We created a level of abstraction that allows administrators to transparently relocate information over a global, distributed namespace, through the use of a distributed LDAP-based directory that was used to map static NFSv4 mount points to unique keys. GPA: 9.15 / 10.0 ("Excellent") · Graduated 2nd in class, Top 1%

PUBLICATIONS

[1] **"Getting back up: Understanding how enterprise data backups fail"**,
George Amvrosiadis, Medha Bhadkamkar.
In Proc. of the 2016 USENIX Annual Technical Conference (ATC). **(Acc.Rate: 19.0%)**

[2] **"Quartet: Harmonizing task scheduling and caching for cluster computing"**,
Francis Deslauriers, Peter McCormick, George Amvrosiadis, Ashvin Goel, Angela Demke Brown.
In Proc. of the 8th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage), 2016.

[3] **"Opportunistic Storage Maintenance"**,
George Amvrosiadis, Angela Demke Brown, Ashvin Goel.
In Proc. of the 25th Symposium on Operating Systems Principles (SOSP), 2015. **(Acc.Rate: 16.5%)**

[4] **"Identifying Trends in Enterprise Data Protection Systems"**,
George Amvrosiadis, Medha Bhadkamkar.
In Proc. of the 2015 USENIX Annual Technical Conference (ATC). **(Acc.Rate: 21.2%)**

[5] **"Temperature Management in Datacenters: Cranking Up the Thermostat Without Feeling the Heat"**,
Nosayba El-Sayed, Ioan Stefanovici, George Amvrosiadis, Andy Hwang, Bianca Schroeder.
In USENIX ;login:, Volume 38, Number 1, February 2013.

[6] **"Practical Scrubbing: Getting to the bad sector at the right time"**,
George Amvrosiadis, Alina Oprea, Bianca Schroeder.
In Proc. of the 42nd Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), Dependable Computing and Communication Symposium (DCCS), 2012. **Highest rated in conference!** (Acc.Rate: 17.3%)

[7] **"Temperature Management in Data Centers: Why Some (Might) Like It Hot"**,
Nosayba El-Sayed, Ioan Stefanovici, George Amvrosiadis, Andy Hwang, Bianca Schroeder.
In Proc. of the Joint International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS/Performance), 2012. **Best Paper Award!** (Acc.Rate: 15.3%)

[8] **"Namespace Management in Federated Filesystems"**
Undergraduate Thesis, University of Ioannina, Greece, 2009. Advisor: Prof. Stergios Anastasiadis.

Teaching Experience

May 2011 - April 2016

Help Centre Teaching Assistant, Computer Science Help Centre,
Dept. of Computer Science, St. George Campus, University of Toronto, Canada

Staffed a Help Centre for Computer Science students, providing help on a drop-in basis for all undergraduate courses. Part of my responsibilities was maintaining familiarity with current assignments in key courses, and tutoring students or student groups on a variety of concepts. | *Total semesters: 11*

Sept 2009 - April 2013

Teaching Assistant, Operating Systems,
Dept. of Computer Science, St. George Campus, University of Toronto, Canada

Worked with instructors: **Karen Reid, Prof. Angela Demke-Brown, Olga Irzak**. Part of my responsibilities was to teach tutorials for students on a weekly basis, mark assignments and exams, and conduct student interviews for progress monitoring. | *Total semesters: 5*

Jan 2011 - April 2014

Teaching Assistant, Software Tools & Systems Programming,
Dept. of Computer Science, St. George Campus, University of Toronto, Canada

Worked with instructors: **Karen Reid, Alan J. Rosenthal, Arnold Rosenbloom**. This is a class with high enrolment, and my responsibilities included: administering and teaching student labs on a weekly basis, filling in for course lectures, and marking assignments and exams. | *Total semesters: 3*

Work Experience

July 2015 - Present

Intern, Veritas Labs,
Veritas World Headquarters, Mountain View, California

Working with **Medha Bhadkamkar** on designing models to auto-configure backup systems for efficiency, to meet predefined SLAs, and as a means for avoiding misconfigurations [1].

Oct 2014 - June 2015

Intern, Symantec Research Labs,
Symantec World Headquarters, Mountain View, California

Worked with **Medha Bhadkamkar** on identifying common practices in the configuration of backup systems [4]. Received two internal performance awards in the duration of the internship.

Sept 2013 - Dec 2013

Student Intern, Storage Technologies Group,
IBM Research – Zurich Lab, Switzerland

Worked with **Christian Cachin, Alessandro Sorniotti, Anil Kurmus** on the design and implementation of a comprehensive security model for an enterprise cluster file system.

Sept 2008 - July 2009

Assistant Administrator, Systems Support Group,
Dept. of Computer Science, University of Ioannina, Greece

As an assistant to the department's administrator, my responsibilities included: introduction and integration of new technologies in production environments, routine system audits and maintenance, software modifications and hardware configuration.

Student Supervision

Through my advisors, Prof. Angela Demke Brown and Prof. Ashvin Goel, I have been fortunate to work closely with the following (brilliant!) undergraduate students, on a number of on-going research projects.

Kasra Kyanzadeh William Cui	**Realistic benchmarking with statistical file system aging, Winter/Summer 2014** The goal of this project is to analyze the data layout in aged file systems. Using this information, we can then generate file systems with the same performance characteristics, for the purposes of realistic benchmarking. Kasra's work focused on extending a tool that extracts metadata for the analysis of existing aged file systems. William worked on creating a tool that uses statistical information from an existing aged file system, to generate another with the same performance characteristics.
Abdi Dahir	**Towards more realistic file system benchmarks, Winter 2014** To improve the realism of existing file system benchmarks, Abdi analyzed real file system traces for a set of characteristics, such as access patterns and request inter-arrival rates. Using these measurements, he then extended the filebench benchmark to use them. Part of this work was used in the evaluation section of [3].
Max Holden Subanjan Mukherjee Pranay Jain	**Opportunistic log-structured file system segment cleaning, Fall 2014/Winter 2015** Max, Suvanjan, and Pranay used the framework described in [3], to develop an opportunistic segment cleaner for the f2fs file system. The augmented segment cleaner was made more efficient, by taking into account data available in memory.
William Kingsford Patrick J. Payne	**Enhancing file synchronization applications using Duet, Fall 2015/Winter 2016** Project in progress.

Talks

Apr. 2016	Data Loss: Worse than Zombie Apocalypse? CSC469/CSC2208: Advanced Operating Systems course, Guest Lecture, Computer Science, University of Toronto.
Nov. 2015	Opportunistic Storage Maintenance Systems Design and Implementation Seminar, Parallel Data Lab, Carnegie Mellon University, Pittsburgh.
Oct. 2015	Opportunistic Storage Maintenance ACM SOSP 2015, Monterey.
Oct. 2015	Opportunistic Storage Maintenance Veritas Research Labs, Mountain View.
June 2015	Identifying Trends in Enterprise Data Protection Systems USENIX ATC 2015, Santa Clara.
June 2015	Identifying Trends in Enterprise Data Protection Systems Veritas Research Labs, Mountain View.
Dec 2014	Towards Understanding Enterprise Backup Systems Symantec Research Labs, Mountain View.
Nov 2013	Dealing with Failure: Detecting hard disk errors before it's too late IBM Research, Zurich.
July 2012	Practical Scrubbing: Getting to the bad sector at the right time EMC RSA Labs, Boston.
July 2012	Practical Scrubbing: Getting to the bad sector at the right time IEEE DSN 2012, Boston.

Selected Awards

Mar. 2016	Doctoral Completion Award (2015-2016), University of Toronto
Feb. 2016	FAST '16 Conference Student Grant, USENIX
Sept 2015	SOSP '15 Conference Student Grant, ACM
June 2015	ATC '15 Conference Student Grant, USENIX
Feb. 2015	Symantec Graduate Fellowship, Symantec Corporation
Aug. 2014	Doctoral Completion Award (2014-2015), University of Toronto
Jan. 2014	FAST '14 Conference Student Grant, USENIX
May 2012	DSN 2012 Student Travel Grant, IEEE
April 2012	School of Graduate Studies Conference Grant, University of Toronto
Jan. 2011	FAST '11 Conference Student Grant, USENIX
Sept. 2009	Wolfond Fellowship, University of Toronto

Side Projects

Filebench	**Simplifying and extending the functionality of Filebench (with V. Tarasov), In Progress** Filebench is a popular open-source benchmark used to evaluate different aspects of file systems performance. This project aims to simplify the codebase of Filebench, making it easier to maintain. In the process, important extensions are made to the functionality of the benchmark to allow it to simulate more realistic workloads.
InnoDB Buffer Pool Extension	**Extending MySQL InnoDB's Buffer Pool (with N. El-Sayed), Fall 2011** We implemented a device-agnostic staging area to function as a space extension for InnoDB's buffer pool. The staging area used lazy-checkpointing to transfer pages between the buffer pool and the disk, while guaranteeing quick recovery in the event of a failure.
TraSim	**Traffic Simulator (with F. Sitaras, K. Tziomakis), Fall 2009** TraSim simulates crossroad traffic light algorithms, supporting cars, pedestrians, and user interaction. The GUI and core codebase are written entirely in Java. TraSim is hosted by SourceForge.net

Personal Trivia

Computer Skills	Preferred Languages: C/C++, R, Matlab, awk, Python; OSes: *nix, MacOS and Windows.
Languages	Greek (*native*), English (*fluent; IELTS, TOEFL, Univ. of Cambridge Lower and Proficiency, Univ. of Michigan Proficiency*), German (*Zertifikat Deutsch*)
Musical Education	Music theory and Piano studies (1992 - 2004); Panorama secondary school orchestra: pianist (2000-2002), conductor (2002-2005)
Community	Organization Committee Member, Computer Science Undergraduate Research Internship program (UTRECS/NSERC-USRA), *University of Toronto*, 2 terms (2012-2014).
	Research In Action Showcase Presenter, Computer Science, *University of Toronto*, 2016.
	Graduate Students' Union Representative for the Dept. of Computer Science, *University of Toronto*, 4 terms (2012-2016).