

STAVROS NIKOLAOU

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Date of Birth: December, 1987

Education

- Ph.D. candidate in the Department of Computer Science, Cornell University, US September 2011 - present
 - Current GPA: 3.962
 - Expected graduation date: May 2016
- B.S. in Computer Science from the Department of Computer Engineering and Informatics, University of Patras, Greece, September 2005 - June 2010
 - Rank: 1st out of 180
 - GPA: 8.77/10
 - Diploma thesis title: "The Computational Power of the Mediated Population Protocol Model"

Scholarships & Awards

- November 2013, *Symposium on Operating Systems Principles (SOSP) student scholarship, travel award.*
- 2009-2010, Graduated 1st among my class of 180 students.
- *Greek State Scholarships Foundation*: Scholarships for excellent academic performance in 2006, 2008 and 2010.

Work Experience

- Microsoft Research, Cambridge, UK
 - Intern at Microsoft Research Systems and Networking group working on the Rack-Scale Computing project. Extended network and software stack of Microsoft's CamCube cluster for facilitating experiments under different topologies. (June 2014 - August 2014)
- R.A. Computer Technology Institute, Research Unit 1, Patras, Greece
 - Member of research group in European project VITRO: Virtualized dIstributed plaTfoRms of smart Objects. Formal verification of integrated protocol stack for Wireless Sensor Networks. (September 2010 - June 2011)
- R.A. Computer Technology Institute, Research Unit 1, Patras, Greece
 - Student Intern working in project FRONTS: Foundational of Adaptive Networked Societies of Tiny Artefacts. Developed a tool for verification of population protocols using C++ and Boost Library. (January 2010 - March 2010)

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Research

I am interested in distributed systems, in particular, their scalability and self-organization aspects. I am currently working with my advisor, Robbert van Renesse, on the moving target defense problem and how we can improve a system's fault-tolerance by introducing dynamicity at the protocol level. In the past, we have worked on cache placement strategies for cooperative caches in the context of online social networks. I am also interested in distributed computing theory and algorithms.

Publications

- S. Nikolaou and R. Van Renesse. Turtle Consensus: Moving Target Defense for Consensus. To appear in *ACM/IFIP/USENIX Middleware Conference (Middleware'15)*, December, 2015.
- S. Nikolaou, and R. Van Renesse. Proactive cache placement on cooperative client caches for online social networks and applications. In: *Transactions on Parallel and Distributed Systems (TPDS)*, 2015.
- S. Nikolaou, R. Van Renesse, and N. Schiper. Cooperative client caching strategies for social and web applications. In: *7th Workshop on Large-Scale Distributed Systems and Middleware (LADIS 2013)*, November, 2013
- I. Chatzigiannakis, O. Michail, S. Nikolaou, and P. G. Spirakis. The Computational Power of Simple Protocols for Self-Awareness on Graphs. In: *13th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, October, 2011.
- I. Chatzigiannakis, O. Michail, S. Nikolaou, A. Pavlogiannis, and P. G. Spirakis. Passively Mobile Communicating Machines that Use Restricted Space. In: *Theoretical Computer Science*, volume 412, number 46, pages 6469-6483, 2011.
- I. Chatzigiannakis, O. Michail, S. Nikolaou, A. Pavlogiannis, and P. G. Spirakis. Passively Mobile Communicating Machines that Use Restricted Space. In: *7th ACM SIGACT/SIGMOBILE International Workshop on Foundations of Mobile Computing (FOMC)*, June, 2011.
- A. Filippas, S. Nikolaou, A. Pavlogiannis, O. Michail, I. Chatzigiannakis, and P. G. Spirakis. Computational Models for Wireless Sensor Networks: A Survey. In *1st International Conference for Undergraduate and Postgraduate Students in Computer Engineering, Informatics, related Technologies and Applications (Eureka!)*. October, 2010.
- I. Chatzigiannakis, O. Michail, S. Nikolaou, A. Pavlogiannis, and P. G. Spirakis. All Symmetric Predicates in $NSPACE(n^2)$ are Stably Computable by the Mediated Population Protocol Model. In *35th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, August, 2010.

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Invited Talks

- 7th Workshop on Large-Scale Distributed Systems and Middleware (LADIS 2013). Cooperative client caching strategies for social and web applications. November, 2013
- 35th International Symposium on Mathematical Foundations of Computer Science (MFCS 2010). All Symmetric Predicates in $NSPACE(n^2)$ are Stably Computable by the Mediated Population Protocol Model. August, 2010

Teaching Experience

- Teaching Assistant for Discrete Structures (Fall 2015), Department of Computer Science, Cornell University, US
- Teaching Assistant for Introduction to Computing Using Python and Object-Oriented Programming and Data Structures (Summer 2015), Department of Computer Science, Cornell University, US
- Teaching Assistant for Operating Systems (Fall 2014), Department of Computer Science, Cornell University, US
- Teaching Assistant for Cloud Computing (Spring 2014), Department of Computer Science, Cornell University, US
- Teaching Assistant for Distributed Systems (2010 - 2011), Computer Engineering and Informatics Department, University of Patras, Greece

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Selected Research and Development Projects

- **Turtle Consensus: Moving Target Defense for Consensus Protocols**

- Advisor: [Robbert Van Renesse](#)
- Proposed and implemented a novel consensus protocol that supports dynamic protocol switching between existing consensus protocols.
- Goal: Provide acceptable performance under denial-of-service attacks.
- The vision is to provide a dynamic reconfiguration mechanism that leverages the diverse characteristics of existing consensus protocols in order to adapt to changes in the workload.

- **Client side caching for social networks**

- Advisor: [Robbert Van Renesse](#)
- Implemented a caching mechanism running on the clients/users of a social network enabling clients to serve each other content in a peer-to-peer like fashion.
- Goal is to offload the social networking service, improve network resources' usage and enhance the scalability of the service.
- The vision is to enable the implementation of web applications with shared state among its users completely on the clients while reducing the role of a "centralized" service to coordinating client-to-client interactions and preserving security and privacy guarantees.

- **Extensible infrastructure for online social games**

- Advisor: [Johannes Gehrke](#)
- Explored the issue of supporting extensions for social games by identifying a set of abstractions and interfaces required for constructing an extensible game.
- Provided a sample implementation capable of supporting simple third party extensions. Also identified certain security challenges related to implementing and deploying such extensions.
- Goals: identify expressive sets of primitives for defining a safe game description language; design infrastructure for enable users/players to collaboratively create modify and distribute extensions in a creative and structured way.

- **StreamCDN: A scalable live-stream delivery network**

- Advisor: [Emin Gün Sirer](#)
- Built an audio content distribution network.
- The implementation was used as a platform to investigate how scalable edge servers can be implemented, under the control of a content delivery service provider.
- Further research directions: Perform in-network transformation of audio streams to multiple formats, with minimal bandwidth and latency costs. Where in the network should such transformation take place? Employ client locality awareness for routing audio streams.

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Skills and Knowledge

- **Operating Systems:** Linux (Ubuntu, Debian), UNIX, Windows.
- **Programming Languages:**
 - Proficient in Java, Python, C, C++, C#, JavaScript, MySQL, PHP, UNIX Shells.
 - Familiar with AJAX, AVR Assembly, AMPL, Prolog, Matlab, Open MP, MPI, OCaml.

Languages

- Greek: Mother Tongue.
- English: Excellent, owner of the TOEFL and Cambridge Proficiency.
- French: Fluent, owner of DELF I and DELF II .

References

- Robbert Van Renesse, Principal Research Scientist, Cornell University, rvr@cs.cornell.edu
- Johannes Gehrke, Tisch University Professor, Cornell University, johannes@cs.cornell.edu