

RESEARCH OBJECTIVE

My research is focused on distributed systems and cloud computing, and I am particularly interested in real-world problems that embody deep trade-offs. I like to craft and validate mathematical models from real-world use of distributed systems to determine the expected behavior, then improve the system or create a new one that optimizes for this expected use case.

EDUCATION

Cornell University, Ph.D. in Computer Science (at age 25). August 2009

Advisor: Prof. Ken Birman. Thesis: *Affinity in Distributed Systems*.

Cornell University, M.Sc. in Computer Science. May 2008

Advisor: Prof. Ken Birman. Topic: *Distributed Slicing*.

University of Iceland, B.Sc. in Mathematics (with Distinction). May 2005

Final project: *Greedy Approximation Algorithms for Sum Coloring of Interval Graphs*.

Advisor: Prof. Magnus M. Halldorsson. Minor: Computer Science.

AWARDS

Yahoo! Key Technical Challenges Research Grant. February 2008

Fulbright Scholarship from the Icelandic Fulbright Commission. 2005-2009

WORK EXPERIENCE

IBM Research, Haifa, Israel. *Research Staff Member*. September 2009–present

Systems based research in the Distributed Middleware group. Projects include a network caching appliance, multicast protocols in clouds and gossip protocols. Supervisor: Dr. Eliezer Dekel.

IBM Research, Haifa, Israel. *Visiting Scientist*. January 2009

Integrated my major research project (Dr. Multicast) into the IBM WebSphere communications layer. Devised a novel optimization algorithm based on a model we created from a real-world trace of the system. Supervisor: Dr. Gregory Chockler.

Yahoo! Research, Santa Clara, CA. *Research Intern*. Summer 2008

Developed, analyzed and implemented a novel approach for performing range queries in a scalable fashion on a massive distributed data storage system. Supervisor: Dr. Brian Cooper.

Iceland Genomics Corporation, Reykjavik, Iceland. *Software Engineer*. Summer 2005

Engineered a program (“CATTAGAT”) to perform a fast approximate search for a primer pair in the human genome. Supervisor: Prof. Magnus M. Halldorsson.

Tal, Reykjavik, Iceland. *System Administrator*. 1999-2003

Created and maintained a large-scale low-level e-mail service along with various administration systems. Security counseling. Full-time employment over summers, part-time with school.

Qualys Technologies, Paris, France. *Software Security Specialist*. Summer 2001

Identified security vulnerabilities in commonly used software. Performed vulnerability research and security software development.

PEER-REVIEWED PUBLICATIONS

1. Q. Huang, D. Freedman, **Y. Vigfusson**, K. Birman, B. Peng. *Kevlar: A Flexible Infrastructure for Wide-Area Collaborative Applications*. To appear in *ACM/IFIP/USENIX 11th International Conference on Middleware*, Bangalore, India. December 2010.
2. G. Chockler, G. Laden, **Y. Vigfusson**. *Data Caching as a Cloud Service*. In *ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Zürich, Switzerland. July 2010.
3. D. Basin, K. Birman, I. Keidar, **Y. Vigfusson**. *Sources of Instability in Data Center Multicast*. In *ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Zürich, Switzerland. July 2010. Brief announcement in *Proceedings of Principles of Distributed Computing (PODC)*, Zürich, Switzerland. July 2010.
4. Q. Huang, **Y. Vigfusson**, K. Birman, H. Li. *Quilt: A Patchwork of Multicast Regions*. In *ACM International Conference on Distributed Event-Based Systems (DEBS)*, Cambridge, UK. July 2010.
5. S. Girdzijauskas, G. Chockler, **Y. Vigfusson**, Y. Tock, R. Melamed. *Magnet: Practical Subscription Clustering for Internet-Scale Publish/Subscribe*. In *ACM International Conference on Distributed Event-Based Systems (DEBS)*, Cambridge, UK. July 2010.
6. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, R. Burgess, K. Birman, G. Chockler, H. Li, Y. Tock. *Dr. Multicast: Rx for Datacenter Communication Scalability*. In the *European Conference on Computer Systems (EuroSys)*, Paris, France. April 2010.
7. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. In the *ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Big Sky, MT. October 2009.
8. **Y. Vigfusson**, A. Silberstein, B. Cooper, R. Fonseca. *Adaptively Parallelizing Distributed Range Queries*. In the *Proceedings of International Conference on Very Large Data Bases (VLDB)*, Lyon, France. August 2009.
9. V. Gramoli, **Y. Vigfusson**, K. Birman, A.M. Kermarrec, R. van Renesse. *Distributed Slicing*. In *IEEE Transactions on Computers, Special Issue on Autonomic Network Computing*, July 2009. Brief announcement in *Proceedings of Principles of Distributed Computing (PODC)*, Toronto, Canada. August 2008.
10. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, K. Birman, Y. Tock. *Dr. Multicast: Rx for Datacenter Communication Scalability*. In the *Workshop on Hot Topics in Networks (Hotnets)*, Alberta, Canada. October 2008. Also in the *Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, White Plains, NY. September 2008.
11. B. Wong, **Y. Vigfusson**, E.G. Sirer. *Hyperspaces for Object Clustering and Approximate Matching in Peer-to-Peer Overlays*. In *Proceedings of the Workshop on Hot Topics in Operating Systems (HotOS)*, San Diego, CA. May 2007.

OTHER PUBLICATIONS AND POSTERS

1. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. In *SIGOPS Operating Systems Review (OSR)* 44(2). April 2010.
2. **Y. Vigfusson**, G. Chockler. *Clouds at the Crossroads: Research Perspectives and Challenges*. In *ACM Crossroads* 16(3), Spring 2010.
3. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. Invited to the *9th Annual International Conference on Peer-to-Peer Computing (P2P)*, Seattle, WA. September 2009.
4. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, K. Birman, G. Chockler, Y. Tock. *Dr. Multicast: Harnessing IP Multicast in Data Centers*. **Best Poster Award**. *6th USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Boston, MA. April 2009. (Poster)
5. H. Abu-Libdeh, **Y. Vigfusson**, K. Birman, M. Balakrishnan. *Ajil: Distributed Rate-limiting for Multicast Networks*. Cornell University Technical Report, Ithaca, NY. December 2008.

6. G. Piliouras, **Y. Vigfusson**. *A Delivery Network Creation Game*. Cornell University Technical Report (TR 1813-11801), Ithaca, NY. November 2006.
7. M.M. Halldorsson, H. Thorgeirsson, **Y. Vigfusson**, H.G. Thormar, J.J. Jonsson. *CATTAGAT: Web Server for Primer Specificity Scan*. At *Genome Informatics Workshop (GIW)*, Yokohama, Japan. December 2004. (Poster).

PATENTS FILED

Parallel Execution of Range Queries on Distributed Partitioned Database. With Adam Silberstein, Brian Frank Cooper and Rodrigo Fonseca. Yahoo! Research, 2008.

TEACHING EXPERIENCE

Cornell University, Ithaca, New York. *Instructor*. Spring 2008

Course: *Advanced UNIX* (sophomore level). Taught Python, along with shell scripts and Perl.

Cornell University, Ithaca, New York. *Teaching Assistant*. 2005-2007

Courses: Discrete Mathematics, Functional Programming Languages, Analysis of Algorithms and Graduate Analysis of Algorithms. Supervisors: Prof. Jon Kleinberg, Radu Rugina, Paul Chew and Eva Tardos, respectively.

University of Iceland, Reykjavik, Iceland. *Teaching Assistant*. 2003-2005

Courses: Discrete Mathematics, and Data Structures and Algorithms. Supervisor: Prof. Hjalmtyr Hafsteinson.

PROFESSIONAL SERVICE

General Co-chair of the LADIS 2010 workshop, Zürich, Switzerland. July 2010.

REFERENCES

Dr. Gregory Chockler, IBM Haifa Research Labs.
Prof. Ken Birman, Cornell University.
Dr. Brian Cooper, Yahoo! Research.
Prof. Magnus M. Halldorsson, Reykjavik University.

OTHER ACTIVITIES

Music: Experienced Pianist (18 years).

Hold a diploma in Classical Piano Performance. Studied Music Composition and Improvisation with Prof. Steven Stucky at Cornell during 2008-2009.

Flying: Private Pilot.

Licensed on single-engine propeller planes in Europe and the USA since 2007. Logged roughly 100 hours.

DanceSport: Competitive Ballroom and Latin Dancer.

Took regular lessons during 2000-2004. Member of the Cornell DanceSport team from 2005 to 2008.

Underwater Diving: Recreational Diver.

Certified PADI Open Water Diver since 2009.