

Last updated in October 2011

## RESEARCH OBJECTIVE

My research is focused on distributed systems and cloud computing. I am particularly interested in societally motivated real-world problems that embody deep trade-offs.

## EDUCATION

**Cornell University**, Ph.D. in Computer Science. August 2009

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

**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 AND HONORS

Nominated by Cornell for the **ACM Doctoral Dissertation Award**. October 2010

**Yahoo! Key Technical Challenges** Research Grant. February 2008

**Fulbright Scholarship** from the Icelandic Fulbright Commission. 2005–2009

## RESEARCH AND WORK EXPERIENCE

**Reykjavik University**, Reykjavik, Iceland. *Assistant Professor*. June 2011–present

Lead the RU Systems group, advise and teach in the School of Computer Science.

**Reykjavik University**, Reykjavik, Iceland. *Adjunct Assistant Professor*. October 2010–May 2011

Advising a Ph.D. student (Kristjan V. Jonsson) in the School of Computer Science on systems research.

**IBM Research**, Haifa, Israel. *Post-doctoral Scientist*. September 2009–June 2011

Systems research in the Distributed Middleware group. I worked on multi-tenant caching services and devising algorithms to improve the performance and feature set for the caching component of IBM's XC-10 network caching appliance. I worked on improving scalability of multicast protocols for data centers (Dr. Multicast) and over wide-area networks (Magnet and GO). I also worked on event-based systems to defend the financial infrastructure against large-scale, coordinated attacks (CoMiFin). Supervisor: Dr. Eliezer Dekel.

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

Integrated Dr. Multicast with the IBM WebSphere VE communications layer prototype. 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 (PNUTS). Supervisor: Dr. Brian Cooper.

**Iceland Genomics Corporation**, Reykjavik, Iceland. *Research Intern.* Summer 2004

Innovated and implemented a very fast search engine for identifying all binding sites for short primer pairs in the human genome with particular emphasis on approximate string matches. Supervisor: Prof. Magnus M. Halldorsson.

**Tal** (ISP), Reykjavik, Iceland. *System Administrator.* 1999-2003

Engineered and maintained a low-level distributed e-mail service for about 30,000 users (100,000 accounts). Designed and implemented various systems and interfaces to facilitate system administration.

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

Discovered security vulnerabilities in commonly used software. Performed security software research and development.

## TEACHING EXPERIENCE

**Reykjavik University**, Reykjavik, Iceland. *Instructor.* Summer 2011

*Structure of Information Networks* (T-SINE-214, 6 ECTS). Designed from scratch but based on the textbook *Network, Crowds and Markets* by Easley and Kleinberg (2010).

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

*Advanced UNIX* (CS214, 4 weeks). Designed the curriculum and homeworks from scratch. Taught Python, common UNIX utilities, shell scripts and Perl to 20 students.

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

*Discrete Mathematics* (CS280, Fall 2005, Prof. Jon Kleinberg),  
*Analysis of Algorithms* (CS482, Spring 2006, Prof. Paul Chew; Spring 2007, Dr. Tom Wexler),  
*Graduate Analysis of Algorithms* (CS681, Fall 2006, Prof. Éva Tardos),  
*Data Structures and Functional Programming* (CS312, Fall 2007, Prof. Radu Rugina).  
 Received a departmental teaching assistance award for Discrete Mathematics.

**University of Iceland**, Reykjavik, Iceland. *Teaching Assistant.* 2003–2004

*Discrete Mathematics* (08.71.23, Fall 2003 and Fall 2004, Prof. Hjalmtyr Hafsteinsson),  
*Data Structures and Algorithms* (08.71.14, Spring 2004, Prof. Hjalmtyr Hafsteinsson).

## PATENTS

**IBM Research**, Haifa, Israel. *Method for Enforcing Occupancy Constraints in a Multi-Tenant CLOCK.* 2011 (filed)

With Gregory Chockler and Guy Laden.

**IBM Research**, Haifa, Israel. *Method for Profiling Cache Space Utility in CLOCK.* 2011 (filed)

With Gregory Chockler and Guy Laden.

**Yahoo! Research**, Santa Clara, CA. *Parallel Execution of Range Query.* 2008 (filed)

With Adam Silberstein and Brian Frank Cooper. United States Patent Application #20100082655.

## PROFESSIONAL SERVICE

Program Committee Member of TERENA Networking Conference (TNC), Reykjavik, Iceland. May 2012.

General Co-chair of the 5th VLDB Large-scale Distributed Systems and Middleware (LADIS) workshop, Seattle, WA. September 2011.

General Co-chair of the 4th ACM SIGOPS/SIGACT Large-scale Distributed Systems and Middleware (LADIS) workshop, Zürich, Switzerland. July 2010.

External reviewer for IEEE Transactions on Networking (ToN) (2011), ACM Computing Surveys (2010), Lecture Notes in Computer Science (2010) and the International Symposium on Distributed Computing (DISC) (2009,2010).

## 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.

## PUBLICATIONS AND POSTERS

1. R. Guerraoui, K. Huguenin, A-M. Kermarrec, M. Monod, **Y. Vigfusson**. *Decentralized Polling with Respectable Participants*. In *Journal of Parallel and Distributed Computing (JPDC)*. December, 2011.
2. G. Chockler, G. Laden, **Y. Vigfusson**. *Design and Implementation of Caching Services in the Cloud*. In *IBM Journal of Research and Development* 55(4). December, 2011.
3. K.V. Jonsson, **Y. Vigfusson**. *Securing Distributed Aggregation with Trusted Devices*. In *16th Nordic Conference in Secure IT Systems (NordSec)*. October, 2011.
4. Q. Huang, D. Freedman, **Y. Vigfusson**, K. Birman, B. Peng. *KeVlar: A Flexible Infrastructure for Wide-Area Collaborative Applications*. In *Proc. ACM/IFIP/USENIX 11th International Conference on Middleware*, Bangalore, India. November 2010.
5. G. Chockler, G. Laden, **Y. Vigfusson**. *Data Caching as a Cloud Service*. In *Proc. ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Zürich, Switzerland. July 2010.
6. D. Basin, K. Birman, I. Keidar, **Y. Vigfusson**. *Sources of Instability in Data Center Multicast*. In *Proc. ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Zürich, Switzerland. July 2010.
7. D. Basin, K. Birman, I. Keidar, **Y. Vigfusson**. *Sources of Instability in Data Center Multicast*. In *Proc. Principles of Distributed Computing (PODC)*, Zürich, Switzerland. July 2010. (Brief announcement).
8. Q. Huang, **Y. Vigfusson**, K. Birman, H. Li. *Quilt: A Patchwork of Multicast Regions*. In *Proc. ACM International Conference on Distributed Event-Based Systems (DEBS)*, Cambridge, UK. July 2010.
9. S. Girdzijauskas, G. Chockler, **Y. Vigfusson**, Y. Tock, R. Melamed. *Magnet: Practical Subscription Clustering for Internet-Scale Publish/Subscribe*. In *Proc. ACM International Conference on Distributed Event-Based Systems (DEBS)*, Cambridge, UK. July 2010.
10. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, R. Burgess, K. Birman, G. Chockler, H. Li, Y. Tock. *Dr. Multicast: Rx for Data Center Communication Scalability*. In *Proc. European Conference on Computer Systems (EuroSys)*, Paris, France. April 2010.
11. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. In *SIGOPS Operating Systems Review (OSR)* 44(2). April 2010.
12. **Y. Vigfusson**, G. Chockler. *Clouds at the Crossroads: Research Perspectives and Challenges*. In *ACM Crossroads* 16(3), March 2010.
13. V. Gramoli, **Y. Vigfusson**, K. Birman, A.M. Kermarrec, R. van Renesse. *Slicing Distributed Systems*. In *IEEE Transactions on Computers* 58(11). November 2009.
14. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. In *Proc. ACM Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, Big Sky, MT. October 2009.

15. **Y. Vigfusson**, Q. Huang, K. Birman, D. Nataraj. *GO: Platform Support For Gossip Applications*. In *Proc. International Conference on Peer-to-Peer Computing (P2P)*, Seattle, WA. September 2009.
16. **Y. Vigfusson**, A. Silberstein, B. Cooper, R. Fonseca. *Adaptively Parallelizing Distributed Range Queries*. In *Proc. International Conference on Very Large Data Bases (VLDB)*, Lyon, France. August 2009.
17. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, K. Birman, G. Chockler, Y. Tock. *Dr. Multicast: Harnessing IP Multicast in Data Centers*. **Best Poster Award**. At *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Boston, MA. April 2009. (Poster)
18. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, K. Birman, Y. Tock. *Dr. Multicast: Rx for Data Center Communication Scalability*. In *Proc. ACM Workshop on Hot Topics in Networks (Hotnets-VII)*, Alberta, Canada. October 2008.
19. **Y. Vigfusson**, H. Abu-Libdeh, M. Balakrishnan, K. Birman, Y. Tock. *Dr. Multicast: Rx for Data Center Communication Scalability*. In *Proc. Workshop on Large-Scale Distributed Systems and Middleware (LADIS)*, White Plains, NY. September 2008.
20. V. Gramoli, **Y. Vigfusson**, K. Birman, A.M. Kermarrec, R. van Renesse. *Sliver: A Fast Distributed Slicing Algorithm* In *Proc. Principles of Distributed Computing (PODC)*, Toronto, Canada. August 2008. (Brief announcement).
21. B. Wong, **Y. Vigfusson**, E.G. Sirer. *Hyperspaces for Object Clustering and Approximate Matching in Peer-to-Peer Overlays*. In *Proc. ACM Workshop on Hot Topics in Operating Systems (HotOS-XI)*, San Diego, CA. May 2007.
22. 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).

## PRESENTATIONS

1. *But What is Cloud Computing?* SKYRR Technology Conference, Invited Talk. Reykjavik, Iceland: September 9, 2011.
2. *Ultra Scalable Messaging Systems*. Reykjavik University, Invited Talk. Reykjavik, Iceland: May 6, 2011.
3. *Ultra Scalable Messaging Systems*. Cornell University, Invited Seminar. Ithaca, NY: April 6, 2011.
4. *Ultra Scalable Messaging Systems*. University of Michigan, Invited Seminar. Ann Arbor, MI: March 31, 2011.
5. *Ultra Scalable Messaging Systems*. University of Chicago, Invited Colloquium. Chicago, IL: March 30, 2011.
6. *Ultra Scalable Messaging Systems*. Technion University, Distributed Systems Seminar. Haifa, Israel: March 17, 2011.
7. *Patchwork Multicast*. Technion University, Industrial Engineering Seminar Series. Haifa, Israel: October 26, 2010.
8. *Patchwork Multicast*. Reykjavik University, Invited Talk. Reykjavik, Iceland: December 30, 2010.
9. *Data Caching as a Cloud Service*. LADIS '10. Zürich, Switzerland: July 29, 2010.
10. *Quilt: A Patchwork of Multicast Regions*. DEBS '10. Cambridge, UK: July 14, 2010.
11. *Dr. Multicast: Rx for Data Center Communication Scalability*. EuroSys '10. Paris, France: April 16, 2010.
12. *Affinity in Distributed Systems*. Reykjavik University, ICE-TCS Seminar. Reykjavik, Iceland: September 18, 2009.
13. *Adaptively Parallelizing Distributed Range Queries*. University of Pierre Marie Curie (LIP6), Seminar. Paris, France: November 23, 2009.
14. *Group Scalability in Distributed Systems*. IRISA-INRIA, Seminar. Rennes, France. November 18, 2009.
15. *Group Scalability in Distributed Systems*. Technion University, ClubNet Seminar. Haifa, Israel: November 11, 2009.
16. *Optimizing Information Flow in the Gossip Objects Platform*. LADIS '09. Big Sky, MO: October 11, 2009.
17. *Adaptively Parallelizing Distributed Range Queries*. VLDB '09. Lyon, France: August 26, 2009.
18. *Dr. Multicast: Rx for Data Center Communication Scalability*. IBM Research, Seminar. Haifa, Israel: January 13, 2009.
19. *Dr. Multicast: Rx for Data Center Communication Scalability*. HotNets '08. Calgary, Canada: October 6, 2008.
20. *Dr. Multicast: Rx for Data Center Communication Scalability*. LADIS '08. White Plains, NY: September 17, 2008.
21. *Sliver: A Fast Distributed Slicing Algorithm*. PODC '08. Toronto, Canada: August 19, 2008.