

Samer Al-Kiswany

Assistant Professor – University of Waterloo

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Research Interests

Storage and File Systems, Operating Systems, Distributed Systems, Cloud Computing, High Performance Computing.

Education

- PhD, Electrical and Computer Engineering, University of British Columbia (July 2013)
- MSc, Electrical and Computer Engineering, University of British Columbia (Dec. 2007)
- BSc, Computer Engineering, Jordan University of Science and Technology (June 2003)

Experience

▪ <i>Assistant Professor. University of Waterloo. School of Computer Science.</i>	Nov. '16 – present
▪ <i>Postdoc. University of Wisconsin-Madison. Computer Sciences Department.</i>	Nov. '13 – Aug. '16
▪ <i>Research Intern. Microsoft Research, Mountain View, CA.</i>	Apr. '13 July '13
▪ <i>Research Intern. NEC Laboratories America, Cupertino, CA.</i>	June '12 – Oct. '12
▪ <i>Software Engineering Intern. Microsoft. Redmond, WA.</i>	June '11 – Aug. '11
▪ <i>Research Intern. IBM Almaden Research Center, San Jose, CA.</i>	June '10 – Oct. '10
▪ <i>Research Intern. Argonne National Laboratory, Chicago, IL.</i>	May '08 – Sep. '08
▪ <i>Research Assistant at UBC.</i>	Sept. '06 – Dec. '13
▪ <i>Research Associate. Jordan University of Science and Technology, Jordan.</i>	June '05 – June '06
▪ <i>Network and Database Admin., King Abdullah University Hospital</i>	Feb. '03 - Sept. '03

Awards, Honors, and Competitions

▪ <i>NSERC Postdoctoral Fellowship</i>	Apr. '13- Aug. '15
National award, Value: \$40,000/year for 2 years. I ranked 4 th Canada-wide (success rate of 8%).	
▪ <i>Best Talk Award at the ECE Department Systems Workshop</i>	Sep. '11
▪ <i>Best Talk Award at ACM HPDC '11 conference</i>	Jun. '11
▪ <i>Killam Doctoral Fellowship</i>	Sep. '09 – Jan '12
National award, Value: \$29,500/year + tuition, for 3 years.	
▪ <i>BC Industrial Innovation PhD Fellowship</i>	Sep. '07 - Sep '10
Provincial award, Value: \$20,000/year + tuition, for 3 years	
▪ <i>Second place in IBK Ivey Business Plan Competition</i>	Mar. '09
Canada's premier competition for commercializable innovative ideas. Value: \$10,000	

▪ <i>ACM-IEEE George Michael Memorial HPC Fellowship Award</i> International award.	Nov. '08
▪ <i>UBC University Graduate Fellowship</i> UBC award, Value: \$16,000 + tuition	Jun. '08 – Jun. '09
▪ <i>Second place in the BCNET Broadband Innovation Challenge Competition</i> Provincial competition. Value: \$2000	Apr. '08
▪ <i>JUST University Graduate Fellowship</i> National award, Value: \$20,000/year for 5 years	Sep. '04 – Sep. '09
▪ <i>Ministry of Education Excellence Scholarship</i> National award, Value: tuition for 5 years.	Sep. '98 – Jun. '03

Publications

Journal Publications

- [1] *Crash Consistency*, T. Pillai, V. Chidambaram, R. Alagappan, S. Al-Kiswany, A. Arpaci-Dusseau, R. Arpaci-Dusseau, *Communications of the ACM*, 58(10): 46-51, October 2015.
- [2] *Crash Consistency: Rethinking the Fundamental Abstractions of the File System*, T. Pillai, V. Chidambaram, R. Alagappan, S. Al-Kiswany, A. Arpaci-Dusseau, R. Arpaci-Dusseau, *ACM Queue*, 13(7), pages 9, July 2015.
- [3] *Support for Provisioning and Configuration Decisions for Data Intensive Workflows*, L. Costa, S. Al-Kiswany, H. Yang, M. Ripeanu, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 27(9), pages 15, June 2015.
- [4] *The Case for Workflow-Aware Storage: An Opportunity Study*, L. Costa, A. Barros, H. Yang, G. Fedak, D. Katz, M. Wilde, E. Vairavanathan, M. Ripeanu, S. Al-Kiswany. *Journal of Grid Computing*, 13(1): 95-113, June 2014.
- [5] *GPUs as Storage System Accelerators*, S. Al-Kiswany, A. Gharaibeh, M. Ripeanu, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 24(8): 1556-1566, May 2012.
- [6] *ThriftStore: Finessing Reliability Tradeoffs in Replicated Storage Systems*, A. Gharaibeh, S. Al-Kiswany, M. Ripeanu, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 22(6): 910-923, April 2010.
- [7] *On GPU's Viability as a Middleware Accelerator*, S. Al-Kiswany, A. Gharaibeh, E. Santos-Neto, M. Ripeanu, *Journal of Cluster Computing*, Springer, 12(2): 123-140, 2009.
- [8] *Beyond Music Sharing: An Evaluation of Peer-to-Peer Data Dissemination Techniques in Large Scientific Collaborations*, S. Al-Kiswany, M. Ripeanu, A. Iamnitchi, S. Vazhkudai, *Journal of Grid Computing*, 7(1): 91-114, April 2009.

Conference Papers

- [9] *A Software-Defined Storage for Workflow Applications*, S. Al-Kiswany, M. Ripeanu, *IEEE Cluster Conference 2016*, Sept. 2016. (acceptance rate 24%).
- [10] *Interacting with Large Distributed Datasets Using Sketch*, M. Budiu, R. Isaacs, D. Murray, G. Plotkin, P. Barham, S. Al-Kiswany, Y. Boshmaf, Q. Luo, A. Andoni, *Eurographics Symposium on Parallel Graphics and Visualization*, 2016.
- [11] *Split-Level I/O Scheduling*, S. Yang, T. Harter, N. Agrawal, S. Kowsalya, A. Krishnamurthy, S. Al-Kiswany, A. Arpaci-Dusseau, R. Arpaci-Dusseau, *ACM Symposium on Operating Systems Principles (SOSP '15)*, 474-489, Oct. 2015. (acceptance rate 16%)
- [12] *All File Systems Are Not Created Equal: On the Complexity of Crafting Crash-Consistent*

- Applications*, T. Pillai, V. Chidambaram, R. Alagappan, S. Al-Kiswany, R. Arpaci-Dusseau, A. Arpaci-Dusseau, Symposium on Operating Systems Design and Implementation (OSDI '14), 433-448, Oct. 2014. (acceptance rate 18%)
- [13] *Physical Disentanglement in a Container-Based File System*, L. Lu, Y. Zhang, T. Do, S. Al-Kiswany, A. Arpaci-Dusseau, R. Arpaci-Dusseau, Symposium on Operating Systems Design and Implementation (OSDI '14), 81-96, Oct. 2014. (acceptance rate 18%)
- [14] *Supporting Storage Configuration for I/O Intensive Workflows*, L. Costa, S. Al-Kiswany, H. Yang, M. Ripeanu, ACM International Conference on Supercomputing (ICS '14), 191-200, June 2014. (acceptance rate 21%)
- [15] *Active Data: A Data-Centric Approach to Data Life-Cycle Management*, A. Simonet, G. Fedak, M. Ripeanu, S. Al-Kiswany, Parallel Data Storage Workshop (PDSW), 39-44, Nov. '13.
- [16] *Predicting Intermediate Storage Performance for Workflow Applications*, L. Costa, S. Al-Kiswany, A. Barros, H. Yang, M. Ripeanu, Parallel Data Storage Workshop, 33-38, Nov. '13.
- [17] *Cost Exploration of Data Sharings in the Cloud*, S. Al-Kiswany, H. Hacigumus, Z. Liu, J. Sankaranarayanan, International Conference on Extending Database Technology, 601-612, March 2013. (acceptance rate 20%)
- [18] *A Workflow-Aware Storage System: An Opportunity Study*, E. Vairavanathan, S. Al-Kiswany, L. Costa, Z. Zhang, D. Katz, M. Wilde, M. Ripeanu, International Symposium on Clusters, Cloud, and Grid Computing (CCGrid '12), 326 – 334, May 2012.
- [19] *Assessing Data Deduplication trade-offs from an Energy Perspective*, L. Costa, S. Al-Kiswany, M. Ripeanu, R. Lopes, Workshop on Energy Consumption and Reliability of Storage Systems (ERSS), 1-6, Orlando, FL, July, 2011
- [20] *VMFlock: VM Co-Migration for the Cloud*, S. Al-Kiswany, D. Subhraveti, P. Sarkar, M. Ripeanu, ACM/IEEE Symposium on High Performance Distributed Computing (HPDC 2011), 159-170, San Jose, CA, June, 2011. (acceptance rate 13%) Best Talk Award.
- [21] *A GPU Accelerated Storage System*, A. Gharaibeh, S. Al-Kiswany, S. Gopalakrishnan, M. Ripeanu, ACM/IEEE Symposium on High Performance Distributed Computing (HPDC 2010), 167-178, Chicago, IL, June, 2010. (acceptance rate 22%)
- [22] *A Case for Versatile Storage System*, S. Al-Kiswany, A. Gharaibeh, M. Ripeanu, Workshop on Hot Topics in Storage and File Systems (HotStorage), October, 2009. Also appeared as ACM SIGOPS Operating Systems Review, 44(1):10-14, January 2010. (acceptance rate 20%)
- [23] *GPU Support for Batch Oriented Workloads*, L. Costa, S. Al-Kiswany, M. Ripeanu, IEEE International Performance Computing and Communications Conf. (IPCCC), 231-238, Dec. '09.
- [24] *StoreGPU: Exploiting Graphics Processing Units to Accelerate Distributed Storage Systems*, S. Al-Kiswany, A. Gharaibeh, E. Santos-Neto, G. Yuan, M. Ripeanu, ACM/IEEE Symposium on High Performance Distributed Computing (HPDC 2008), 165-174, Boston, MA, June, 2008. (acceptance rate 17%)
- [25] *Configurable Security for Scavenged Storage Systems*, A. Gharaibeh, S. Al-Kiswany, M. Ripeanu, 4th International Workshop on Storage Security and Survivability (StorageSS 2008), 55-62, Alexandria, Virginia, October 2008.
- [26] *stdchk: A Checkpoint Storage System for Desktop Grid Computing*, S. Al-Kiswany, M. Ripeanu, S. Vazhkudai, A. Gharaibeh, Int. Conf. on Distributed Computing Systems (ICDCS), 613-624, June '08. (acceptance rate 16%)
- [27] *Beyond Search and Navigability: Custom Metadata Can Enable Cross-Layer Optimizations in Storage Systems*, E. Santos-Neto, S. Al-Kiswany, N. Andrade, S. Gopalakrishnan, M. Ripeanu, ACM/IEEE Symposium on High Performance Distributed Computing (HPDC) - Hot Topics Track, Boston, MA, June, 2008. (acceptance rate 17%)

- [28] *Are Peer-to-Peer Data-Dissemination Techniques Viable in Today's Data Intensive Scientific Collaborations?*, S. Al-Kiswany, M. Ripeanu, A. Iamnitchi, S. Vazhkudai. The 13th International Euro-Par Conference, European Conference on Parallel and Distributed Computing, 4641: 404-414, Rennes, France, August, 2007.
- [29] *A New Algorithm for Arabic Optical Character Recognition*, O. Al-Jarrah, S. Al-Kiswany, B. Al-Gharaibeh, M. Fraiwan, H. Khasawneh, WSEAS Transactions on Information Science and Applications, 4(3): 211-224, April 2006. (Undergraduate project)

Patents

- [P1] *Cost Exploration of Data Sharings in the Cloud*, S. Al-Kiswany, H. Hacigumus, Z. Liu, J. Sankaranarayanan. US patent US20140122374 A1, May 2014.
- [P2] *Deduplicated Virtual Machine Image Transfer*, S. Al-Kiswany, M. Ripeanu, Patent CA-821335-02-US-NAT, May 2012.
- [P3] *Virtual Machine Image Co-migration*, S. Al-Kiswany, C. Constantinescu, P. Sarkar, M. Seaman, D. Subhraveti, US patent. 8,442,955. Mar 2011.

Service (selected)

- *Organizing committee member: travel awards chair* for HPDC '14.
- *Program committee member* for:
 - ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC '17)
 - IEEE/ACM International Conference on Big Data Computing, Applications and Technologies (BDCAT '16)
 - IEEE CloudCom ('14 and '15)
 - IEEE/ACM Big Data Computing (BDC '14 and '15)
 - ScienceCloud Workshop ('12, '13, '14, and '15)
 - Data Intensive Computing in the Clouds (DataCloud '12, '13, and '14)
 - IEEE Parallel and Distributed Systems (ICPADS '13)
 - IEEE Parallel and Distributed Processing with Applications (ISPA '12 and '13)
 - Workshop on Cloud Computing Systems, Networks, and Applications (CCSNA '13)
 - External reviewer for numerous other conferences including ISPAS '13, CCGrid '13, EuroPar '10, and VTDC '09.
- *Reviewer for the following journals*:
 - ACM Operating System Reviews (OSR)
 - IEEE Transactions on Parallel and Distributed Systems (TPDS)
 - IEEE Transactions on Multi-Scale Computing Systems (TMSCS)
 - IEEE Transactions on Cloud Computing (TCC)
 - IEEE Transactions on Computers (TC)
 - Journal of Cluster Computing (JCC)
 - Journal of Systems Architecture (JSA)
 - Journal of Parallel and Distributed Computing (JPDC)
- *Invited speaker* at the Sauder MBA School Entrepreneur Luncheon '09.
- *Scribe* for the SOSp '09 conference and LADIS '09 workshop.
- *Student Volunteer* for the Supercomputing SC '08, and '07 conferences.
- *Volunteered* at the ECE department Open House '07, and '09.