Ashish Vulimiri
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Research Interests

Networked and distributed systems, with a focus on Big Data analytics, and low-latency networking within data centers and in the Internet

Education

Aug 2009 - Aug 2015 (expected)	University of Illinois at Urbana-Champaign Ph.D. in Computer Science Advisor: Prof. P. Brighten Godfrey
Aug 2005 - May 2009	Indian Institute of Technology at Kharagpur B.Tech.(Honours) in Computer Science and Engineering Thesis title: Misbehavior Detection in Vehicular Ad Hoc Networks

Publications

- Ashish Vulimiri, Carlo Curino, Brighten Godfrey, Thomas Jungblut, Jitu Padhye, George Varghese, "Global analytics in the face of bandwidth and regulatory constraints", *USENIX NSDI 2015*
- Ashish Vulimiri, Carlo Curino, Brighten Godfrey, Thomas Jungblut, Konstantinos Karanasos, Jitu Padhye, George Varghese, "WANalytics: Geo-distributed analytics for a data-intensive world", demo at *ACM SIGMOD 2015*
- Ashish Vulimiri, Carlo Curino, Brighten Godfrey, Konstantinos Karanasos, George Varghese, "WANalytics: Analytics for a geo-distributed data-intensive world", *ACM CIDR 2015*
- Ashish Vulimiri, Brighten Godfrey, Radhika Mittal, Justine Sherry, Sylvia Ratnasamy, Scott Shenker, "Low latency via redundancy", *ACM CoNEXT 2013*
- Ashish Vulimiri, Oliver Michel, Brighten Godfrey, Scott Shenker, "More is less: Reducing latency via redundancy", *ACM HotNets 2012*
- Ashish Vulimiri, Gul A. Agha, Brighten Godfrey, Karthik Lakshminarayanan, "How well can congestion pricing neutralize denial-of-service attacks?", *ACM SIGMETRICS 2012*
- Anjan Sarkar, Ashish Vulimiri, Suman Paul, Mohammed J. Iqbal, Avishek Banerjee, Rahul Chatterjee, Shibendu S. Ray, "Unsupervised and supervised classification of hyperspectral image data using projection pursuit and Markov random field segmentation", *International Journal of Remote Sensing*, Vol. 33 Issue 18, 2012
- Ashish Vulimiri, Arobinda Gupta, Pramit Roy, Skanda N. Muthaiah, Arzad A. Kherani, "Application of secondary information for misbehavior detection in VANETs", *IFIP Networking 2010*
- Anjan Sarkar, Ashish Vulimiri, Shantanu Bose, Suman Paul, Shibendu S. Ray, "Unsupervised hyperspectral image analysis with projection pursuit and MRF segmentation approach", in *2008 International Conference on Artificial Intelligence and Pattern Recognition (AIPR-08)*

Talks and Posters

- "Reducing latency via redundancy": Talk at the 15th GENI Engineering Conference (GEC15, Aug 2012)
- "Adaptive routing with end-to-end feedback"
  - Talk at GEC9 (Nov 2010)
  - Poster at GEC8 (Jul 2010)

Employment

2009 – present	Research Assistant, Department of Computer Science, UIUC
Summer 2014	Intern, Microsoft CISL, Silicon Valley
Summer 2013	Intern, Microsoft Research, Silicon Valley
Summer 2011	Intern, Microsoft Research, Cambridge
Summer 2008	Intern, Microsoft Research, Redmond
May 2007 – Aug 2008	Software Engineer (part-time), Minekey Inc.

Projects

- **Geo-distributed analytics**
  with Carlo Curino, Microsoft CISL, and George Varghese, Microsoft Research, Silicon Valley
  Worked on building a system supporting data analytics on massive volumes of data collected across several data centers around the world, incorporating a range of optimizations to reduce data transfer costs. The prototype I built functions as a drop-in multi-data center replacement for Apache Hive and Oozie, standard local analytics frameworks in the Apache Hadoop ecosystem.

- **Reducing latency via redundancy**
  with Brighten Godfrey, UIUC and Scott Shenker, UC Berkeley
  Investigated request replication as a general-purpose technique for reducing latency. I evaluated the tradeoff between added overhead and reduced latency both empirically, by running large scale experiments with a range of systems including DNS, data center networks, key-value stores, the TCP handshake, and multipath overlay networks; and analytically, by studying queueing-theoretic and economic models of system performance.

- **Scheduling multi-resource jobs**
  with Hitesh Ballani and Thomas Karagiannis, Microsoft Research Cambridge
  Developed an alternative Apache Hadoop scheduler that achieved increased cluster utilization by ensuring a mix of tasks with different resource profiles at every node, avoiding e.g. co-scheduling IO-intensive tasks on the same node.

- **Mitigating denial-of-service attacks via congestion pricing**
  with Brighten Godfrey, UIUC and Karthik Lakshminarayanan, Google
  Evaluated congestion pricing as a way of mitigating DoS attacks, via a game-theoretic analysis backed by large-scale simulations.

Teaching

Fall 2012	Teaching Assistant, Department of Computer Science, UIUC Fundamental Algorithms (CS 473)
Spring 2012	Teaching Assistant, Department of Computer Science, UIUC Undergraduate Research Laboratory (CS 498LA)

Professional Activities

- Reviewer for: ACM CCR 2014, IEEE Network 2014, ACM CCR 2013, IEEE SASO 2012, ACM SPAA 2012
- Advised undergraduate student Zitian Liu on work that led to his undergraduate thesis
- Advised seven undergraduate students on semester-long research projects in Spring 2012, as the TA for CS 498LA (Undergraduate Research Laboratory)

References

- **Prof. P. Brighten Godfrey**
  Department of Computer Science
  University of Illinois at Urbana-Champaign
  pbg@illinois.edu
- **Dr. Carlo Curino**
  Senior Scientist
  Microsoft CISL, Silicon Valley
  ccurino@microsoft.com
- **Dr. George Varghese**
  Principal Researcher
  Microsoft Research, Silicon Valley
  varghese@microsoft.com