ADITYA K. MISHRA

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RESEARCH INTERESTS

Distributed Systems and Networking, Cyber-Physical Systems, Sustainability, Smart Grids

EDUCATION

PhD in Computer Science — September 2015
University of Massachusetts, Amherst, MA
Adviser: Prof. Prashant Shenoy

Master of Technology in Information Technology — May 2007
Indian Institute of Technology (IIT), Bombay, India

Bachelor of Engineering in Information Technology — June 2005
Shri Vaishnav Institute of Technology and Science (SVITS), Indore, India

HONORS

- Seattle University Center for Environmental Justice and Sustainability Fellow 2016-2017
- **Best paper award runner-up** ACM BuildSys 2014
- **Best paper award finalist** ACM e-Energy 2013
- Paper in **best papers session** at PerCom-2012
- School of Computer Science **Outstanding Graduate Student Award** (2012)
- Passed the PhD qualifying exam at UMASS (Portfolio) with **distinction** in 2012 (distinction awarded to two students).
- Invited to Google GRAD CS Forum 2012
- All India rank 28 in GATE (2004)
- Certificate of Merit for being among top 0.1 % in All India Secondary School Examination in science (1999)

RESEARCH EXPERIENCE

University of Massachusetts, Amherst, *Research Assistant* with Prof. Prashant Shenoy (Fall 2010-present)
I adopted a systematic approach to understand how to optimize energy consumption profiles of smart buildings, so as to make them sustainable, grid-friendly, and reduce their electricity bills. I deployed sensors at buildings and collected real-world data. In my work, I drew from several fields of applied computer science and mathematics, such as analytical modeling, optimization, machine learning, and big data. I also built research prototypes for the proposed solutions.

IBM Research, Zurich, *Intern* with Dr. Dieter Gantenbein (Summer 2012)
To enable EV (Electric Vehicle) smart charging, I Designed a communication protocol between an EVFO (Electric Vehicle Fleet Operator) and an electricity retailer. By EV smart charging the proposed interface further facilitates electric grid regulation on

top of existing information and communication channels. Further, in the context of EcoGrid, I enhanced the existing price distribution protocol and proposed an architecture for distributing real time electricity prices in smart grids.

University of Massachusetts, Amherst, *Research Assistant* with Prof. Arun Venkataramani (Fall 2009-Summer-2010)
Studied the impact of various traffic engineering (TE) schemes on user-perceived application performance. We found that link utilization metrics are poor predictors of application performance. Despite significant differences in MLU, all TE schemes and even a static shortest-path routing scheme achieve nearly identical application performance.

Indian Institute of Technology, Bombay, *Master's Student*, with Prof. A. Sahoo (Fall 2005-Spring 2007)
Worked on Quality of Service protocols, and traffic engineering algorithms for networks. I proposed two novel traffic engineering algorithms for OSPF based best-effort networks.

PAST TEACHING EXPERIENCE

- **Instructor for CPSC 5042: Computer Systems Principles II (Spring-16, SU)**
- **Instructor for CPSC 5910: Computer Architecture (Winter-16, SU)**
- **Instructor for CPSC 2500: Computer Organization (Fall, winter-16, SU)**
- **TA for CMPSCI 453: Computer Networks (Spring-15, UMass)**
- **Instructor for COMSC-322: Operating Systems (Fall-14, Mount Holyoke College)**
- **TA for CMPSCI 453: Computer Networks (Fall-14, UMass)**
- **TA for CMPSCI 105: Computer Literacy (Spring-11, UMass)**
- **TA for CMPSCI 187: Programming With Data Structures (Fall-10, UMass)**
- **TA for CS 653 Mobile Computing (Spring-07, IIT Bombay)**
- **TA for CS 680 Quality of Service in Networks (Fall-06, IIT Bombay)**
- **TA for APCPP Advanced Programming in C++ (Spring-06, IIT Bombay)**
- **TA for MG 647 Entrepreneurship (Fall-05, IIT Bombay)**

INDUSTRY EXPERIENCE

Oracle India Pvt. Ltd., *Member Technical Staff*, August 2007-July-2009
As a member of Advanced Technology Team, my job had two components, product related research and development. I contributed in platform API development for OCS (Oracle Collaboration Suite), designed and developed the RSS based syndication service in OCS.

JOURNAL PUBLICATIONS

1. Aditya K. Mishra, David E. Irwin, Prashant J. Shenoy, Jim Kurose and Ting Zhu.. "GreenCharge: Managing Renewable Energy in Smart Buildings," *IEEE Journal on Selected Areas in Communications* (JSAC), Special Series on Smart Grid Communications, 31(7):1281-1293, July 2013.

CONFERENCE PUBLICATIONS

2. Aditya Mishra, Anirudha Sahoo, Bhavana Dalvi and Ting Zhu. "WOSPF: A Traffic Engineering Solution for OSPF Networks," IEEE GLOBECOM, December 2016.
3. Bhavana Dalvi Mishra, Aditya Mishra and William W. Cohen. "Hierarchical Semi-supervised Classification with Incomplete Class Hierarchies," *Proceedings of the 9th ACM International Conference on Web Search and Data Mining* (WSDM 2016), February 2016.
4. Aditya Mishra, Ramesh Sitaraman, David Irwin, Ting Zhu, Prashant Shenoy, Bhavana Dalvi Mishra, and Stephen Lee. "Integrating Energy Storage in Electricity Distribution Networks," *Proceedings of the 6th ACM Intl. Conference on Future Energy Systems* (ACM e-Energy), July 2015.
5. Zhichuan Huang, Jikui Su, Ting Zhu, Ankur Sharma, Ameya Ambegaonkar, Yu Gu, David Irwin, Aditya Mishra, and Prashant Shenoy. "Minimizing Electricity Costs by Sharing Energy in Sustainable Microgrids," *Proceedings of the 1st ACM International Conference on Embedded Systems for Energy-Efficient Buildings* (BuildSys), 2014. **Best paper award runner-up**.
6. Aditya Mishra, David Irwin, Prashant Shenoy and Ting Zhu. "Scaling distributed energy storage for grid peak reduction," *Fourth ACM international Conference on Future Energy Systems* (ACM e-Energy), May 2013. **Best paper award finalist**.
7. Ting Zhu, Zhichuan Huang, Ankur Sharma, Jikui Su, David Irwin, Aditya Mishra, Daniel Menasche and Prashant Shenoy. "Sharing Renewable Energy in Smart Microgrids," *ACM/IEEE 4th International Conference on Cyber-Physical Systems* (ACM/IEEE ICCPS), April 2013.
8. Dieter Gantenbein, Carl Binding, Bernhard Jansen, Aditya Mishra and Olle Sundstrom. "EcoGrid EU: An efficient ICT approach for a sustainable power system," *Sustainable Internet and ICT for Sustainability* (IEEE SustainIT), October 2012.
9. Sean Barker, Aditya Mishra, David Irwin, Emmanuel Cecchet, Prashant Shenoy and Jeannie Albrecht. "Smart*: An Open Data Set and Tools for Enabling Research in Sustainable Homes," *Workshop on Data Mining Applications in Sustainability* (SustKDD), August 2012.
10. Aditya Mishra, David Irwin, Prashant Shenoy, Jim Kurose and Ting Zhu. "SmartCharge: cutting the electricity bill in smart homes with energy storage," *Third International Conference on Future Energy Systems* (ACM e-Energy), May 2012.
11. Sean Barker, Aditya Mishra, David Irwin, Prashant Shenoy and Jeannie Albrecht. "SmartCap: Flattening peak electricity demand in smart homes," *The tenth IEEE International Conference on Pervasive Computing and Communications* (PerCom), March 2012. Paper in **best papers session**.
12. Ting Zhu, Aditya Mishra, David Irwin, Navin Sharma, Prashant Shenoy and Don Towsley. "The Case for Efficient Renewable Energy Management for Smart Homes," *Third Workshop on Embedded Sensing Systems for Energy-efficiency in Buildings* (BuildSys), November 2011.
13. David Irwin, Anthony Wu, Sean Barker, Aditya Mishra, Prashant Shenoy and Jeannie Albrecht. "Exploiting Home Automation Protocols for Load Monitoring in Smart Buildings," *Third Workshop on Embedded Sensing Systems for Energy-efficiency in Buildings* (BuildSys), November 2011.
14. Abhigyan Sharma, Aditya Mishra, Vikas Kumar and Arun Venkataramani. "Beyond MLU: An application-centric comparison of traffic engineering schemes," *IEEE INFOCOM*, April 2010.
15. Aditya K. Mishra and Anirudha Sahoo. "S-OSPF: a traffic engineering solution for OSPF based best effort networks," *IEEE GLOBECOM*, November 2007.

OTHER PUBLICATIONS

16. Bernhard Jansen, Carl Binding, Aditya Mishra. "Input on the Real-Time Price distribution protocol for Ecogrid EU WP 3 Task 3.6," `http://www.zurich.ibm.com/pdf/ecogrid/price_distribution_protocol_1.2.pdf`, September 2012.
17. Aditya Mishra, Dieter Gantenbein, Bernhard Jansen. "IBM FERN Smart Charging Interface between EV FO and Retailer," `http://www.zurich.ibm.com/pdf/ecogrid/b2bprotocol_ver1.1.pdf`, July 2012.

INVITED TALKS

"Demand-side Energy Management and Peak Load Shaving for Smart Homes", *IBM T.J. Watson Research Center*, November 2011.

"Exploiting Energy Storage in Smart Buildings", *Holyoke Gas and Electric*, October 2012.