

Nipun Batra

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CURRENT ROLE

Postdoctoral Scholar

Mar 2017 - Present¹

University of Virginia, Charlottesville.

Advisors: Kamin Whitehouse, Hongning Wang

– Grants

Assisted Kamin Whitehouse and Hongning Wang in writing the grant entitled - Collaborative Sensing: An Approach for Immediately Scalable Sensing in Buildings awarded \$425,000 by NSF.

– Proposal presentations

Presented our work at the annual NSF Cyber Physical Systems proposals meeting

Nov 2017

EDUCATION

PhD in Computer Science,

Jan 2012 - Mar 2017 (submitted Nov 2016, defended Mar 2017)

IIT Delhi

Advisor: Amarjeet Singh, Kamin Whitehouse (University of Virginia)

Thesis: Systems and Analytical Techniques Towards Practical Energy Breakdown for Homes

CGPA: 9.3/10.0

B.E. in Computer Engineering,

Aug 2007 - May 2011

Delhi College of Engineering, Delhi, India

CGPA: 9/10.0

HSC [Class XII] (CBSE board),

Apr 2007

Mount St. Mary's School, Delhi, India

Percentage: 85.6

SSC [Class X] (CBSE board),

Apr 2005

Mount St. Mary's School, Delhi, India

Percentage: 92.2

HONOURS AND AWARDS

Best video nominee (acceptance rate: 3.1%) at KDD

2016

Finalist in UChicago Delhi urban challenge (acceptance rate: 3.6%)

2016

3rd position in IoT Hackathon at MSR Summer School

2016

Best presentation award at SenSys Doctoral Colloquium

2015

Best demo award at Buildsys

2014

TCS PhD fellowship

2012

Systems engineering prize barrel, AUVSI's student UAS competition

2010

Director's award for best effort, AUVSI's student UAS competition

2009

Travel grants

AAAI grant for AAAI 2017; Google, MSR and ACM travel grant for KDD 2016; ACM travel grant for SenSys 2015; ACM travel grant for e-Energy 2014; Young scientist travel grant for AUVSI UAS competition from DST (Govt. of India) 2009.

¹While officially I could start postdoc only after PhD defense (Mar 2017), I unofficially did postdoc work from Nov 2016 (thesis submission) to Mar 2017

RESEARCH & INDUSTRIAL EXPERIENCE

Graduate Research Assistant IIT Delhi	<i>Jan 2012 - Mar 2017</i>
Visiting Research Scholar University of Virginia (with Kamin Whitehouse)	<i>Jun 2014 - Apr 2015</i>
Software Analyst Royal Bank of Scotland, Gurgaon, India	<i>Jun 2011 - Nov 2011</i>
Undergraduate Researcher Linux Android Network Systems Lab, Delhi College of Engineering	<i>Dec 2010 - Jun 2011</i>
Software Engineering Intern Goldman Sachs, Bangalore	<i>Jun 2010 - Aug 2010</i>
Undergraduate Research Intern Unmanned Aircraft Systems Lab, Delhi College of Engineering	<i>Dec 2008 - Jul 2010</i>

TEACHING EXPERIENCE

Computer Networks (taught by Prof. Dheeraj Sanghi) <i>Head Teaching Assistant</i> Class size of 160, took 1 guest lecture, managed other TAs, evaluations, and tutorials.	<i>Winter 2016</i>
Embedded Systems (taught by Dr. Amarjeet Singh) <i>Teaching Assistant</i> Class size of 30, managed labs, evaluations, and took 1 guest lecture.	<i>Winter 2013</i>
Introduction to Programming (taught by Dr. Gaurav Gupta) <i>Head Teaching Assistant</i> Class size of 160, managed other TAs, took 4 guest lectures, labs, evaluations.	<i>Autumn 2012</i>

PUBLICATIONS (GOOGLE SCHOLAR PROFILE)

Selected Peer-reviewed articles²

1. **Nipun Batra**, Yiling Jia, Hongning Wang, Kamin Whitehouse
Transferring Decomposed Tensors for Scalable Energy Breakdown across Regions
* AAAI 2018. New Orleans, USA (**Acceptance rate: 25%**)
2. **Nipun Batra**, Hongning Wang, Amarjeet Singh, Kamin Whitehouse
Matrix Factorisation for Scalable Energy Breakdown
* AAAI 2017. San Francisco, USA (**Acceptance rate: 25%**)
3. **Nipun Batra**, Amarjeet Singh, Kamin Whitehouse
Gemello: Creating a Detailed Energy Breakdown from just the Monthly Electricity Bill
* KDD 2016. San Francisco, USA (**Acceptance rate: 19%**)
4. **Nipun Batra**, Amarjeet Singh, Kamin Whitehouse
If You Measure It, Can You Improve It? Exploring The Value of Energy Disaggregation
* Buildsys 2015. Seoul, Korea (**Acceptance rate: 29%**)
5. **Nipun Batra**, Jack Kelly, Oliver Parson, Haimonti Dutta, William Knottenbelt, Alex Rogers, Amarjeet Singh, and Mani Srivastava
NILMTK: An Open Source Toolkit for Non-intrusive Load Monitoring
ACM eEnergy 2014. Cambridge, UK (**Acceptance rate: 20%, 150+ citations**)
6. **Nipun Batra**, Manoj Gulati, Amarjeet Singh, and Mani Srivastava
It's Different: Insights into home energy consumption in India
* Buildsys 2013, Rome, Italy (**60+ citations**)
7. Pandarasamy Arjunan, **Nipun Batra**, Haksoo Choi, Amarjeet Singh, Pushpendra Singh, and Mani Srivastava
SensorAct: A Privacy and Security Aware Federated Middleware for Building Management
* Buildsys 2012, Waterloo, Canada, (**40+ citations**)

²A* or A conferences as per 2018 CORE CS rankings are highlighted using *

Other Peer-reviewed articles

1. Oliver Parson, Grant Fisher, April Hersey, **Nipun Batra**, Jack Kelly, Amarjeet Singh, William Knottenbelt, Alex Rogers
Dataport and NILMTK: A Building Data Set Designed for Non-intrusive Load Monitoring
GlobalSip, Orlando, FL, USA
2. **Nipun Batra**, Haimonti Dutta and Amarjeet Singh
INDiC: Improved Non-Intrusive load monitoring using load Division and Calibration
ICMLA 2013, Miami, USA
3. **Nipun Batra**, Pandarasamy Arjunan, Amarjeet Singh and Pushpendra Singh
Experiences with Occupancy Based Building Management Systems
ISSNIP 2013, Melbourne, Australia

Posters, Demos, and Doctoral Colloquiums

1. **Nipun Batra**
Non Intrusive Load Monitoring: Systems, Metrics and Use Cases
🏆 Sensys 2015 (**Best presentation award**)
2. Jack Kelly, **Nipun Batra**, Oliver Parson, Haimonti Dutta, William Knottenbelt, Alex Rogers, Amarjeet Singh, and Mani Srivastava
NILMTK v0. 2: A Non-intrusive Load Monitoring Toolkit for Large Scale Data Sets
🏆 Buildsys 2014 (**Best demo award**)
3. **Nipun Batra**, Manoj Gulati, Puneet Jain, Kamin Whitehouse and Amarjeet Singh
Bits and watts: improving energy disaggregation performance using power line communication modems
Buildsys 2014

Technical Reports

1. **Nipun Batra**, Rishi Baijal, Amarjeet Singh, Kamin Whitehouse
How good is good enough? Re-evaluating the bar for energy disaggregation
2. **Nipun Batra**, Amarjeet Singh, Kamin Whitehouse
Neighbourhood NILM: A Big-data Approach to Household Energy Disaggregation
3. **Nipun Batra**, Oliver Parson, Mario Berges, Amarjeet Singh, Alex Rogers
A comparison of non-intrusive load monitoring methods for commercial and residential buildings
(**20+ citations**)
4. **Nipun Batra**, Amarjeet Singh, Pushpendra Singh, Haimonti Dutta, Venkatesh Sarangan, and Mani Srivastava
Data Driven Energy Efficiency in Buildings

SERVICE

PC Chair

- 4th International NILM workshop (Expecting 100+ attendees, 10 oral talks, 20 posters) 2018
Austin, Texas, USA

Steering Committee

- 3rd International NILM workshop 2016
Vancouver, Canada

Program Committee

- 2nd International NILM workshop 2014
Austin, Texas, USA

External Reviewer

- Transactions on Mobile Computing, Buildsys 2015, Ubicomp 2015, E-Energy2015, E-Energy 2014, ASONAM 2013, E-Energy 2013, ICDM 2013, Buildsys 2013

Institute Service

- Ph.D. bootcamp organiser and instructor for new Ph.D. admits at IIIT Delhi 2017
- Weekly Ph.D. seminar organiser 2015-2016
- Ph.D. induction 2013, 2014, 2015
- Teaching assistant induction 2014

INVITED TALKS

- Aspiring Minds Research, Delhi *The Billion Building Challenge* 2016
- IBM Research, Delhi *Towards practical energy breakdown* 2016
- Stanford University *Towards energy disaggregation for a 100 million homes* 2016
- University of Pennsylvania *If you can measure it, can you improve it?* 2015
- Carnegie Mellon University *If you can measure it, can you improve it?* 2015

MENTORING

- Yiling Jia, Ph.D. student at University of Virginia *Transfer learning for energy breakdown across regions* Mar 2017- Present
Co-author
- Anmol Singh, B.Tech. at IIITD *Factorisation for scalable energy breakdown* Jan 2017 - Aug 2017
Independent project
- Rishi Baijal, B.Tech. at IIITD *Non-intrusive occupancy detection* Jan 2015 - Dec 2015
Bachelor's thesis
- Ishaan Malhotra, B.Tech. at DTU *Smart meter based energy disaggregation* July 2012 - Dec 2013
Bachelor's thesis
- Ayushi Aggarwal, B.Tech. at IIITD *Reproducible energy disaggregation* Jan 2013 - Jul 2013
Independent project
- Akshit Gupta, B.Tech. at IIITD *Appliance energy modelling* Aug 2012 - Dec 2012
Independent project, IIITD

REFERENCES

Kamin Whitehouse

Associate Professor, University of Virginia
Contact: whitehouse@virginia.edu

Amarjeet Singh

Assistant Professor, IIT Delhi
Contact: amarjeet@iiitd.ac.in

Hongning Wang

Assistant Professor, University of Virginia
Contact: hw5x@virginia.edu

Mani Srivastava

Professor, UCLA
Contact: mbs@ucla.edu

Pankaj Jalote

Director, IIT Delhi
Contact: jalote@iiitd.ac.in