

Nipun Batra

Date of Birth: 15 Nov 1989
Nationality: Indian
Website: <https://nipunbatra.github.io>
Email: nipun.batra@iitgn.ac.in

Address: 6/407D, Academic Block
IIT Gandhinagar, Gujarat, India - 382355
Github: <https://github.com/nipunbatra>

CURRENT ROLE

Assistant Professor

Computer Science and Engineering
IIT Gandhinagar, Gujarat, India

July 2018 - Present

EDUCATION

PhD in Computer Science, IIIT 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

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

B.E. in Computer Engineering, Delhi College of Engineering, Delhi, India CGPA: 9/10.0

Aug 2007 - May 2011

HSC [Class XII] (CBSE board), Mount St. Mary's School, Delhi, India Percentage: 85.6

Apr 2007

SSC [Class X] (CBSE board), Mount St. Mary's School, Delhi, India Percentage: 92.2

Apr 2005

GRANT, HONOURS AND AWARDS

Microsoft AI for Earth Grant (USD 15000 in Azure credits)	<i>2018</i>
Excellence in Research Grant at IIT Gandhinagar	<i>2018</i>
Nvidia GPU grant	<i>2018</i>
Best video nominee (acceptance rate: 3.1%) at KDD	<i>2016</i>
Finalist in UChicago Delhi urban challenge (acceptance rate: 3.6%)	<i>2016</i>
3 rd position in IoT Hackathon at MSR Summer School	<i>2016</i>
Best presentation award at SenSys Doctoral Colloquium	<i>2015</i>
Best demo award at Buildsys	<i>2014</i>
TCS PhD fellowship	<i>2012</i>
Systems engineering prize barrel, AUVSI's student UAS competition	<i>2010</i>
Director's award for best effort, AUVSI's student UAS competition	<i>2009</i>
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.

RESEARCH & INDUSTRIAL EXPERIENCE

Postdoctoral Scholar

Mar 2017 - Jun 2018

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

Graduate Research Assistant

Jan 2012 - Mar 2017

IIT Delhi

Visiting Research Scholar

Jun 2014 - Apr 2015

University of Virginia (with Kamin Whitehouse)

Software Analyst

Jun 2011 - Nov 2011

Royal Bank of Scotland, Gurgaon, India

Undergraduate Researcher

Dec 2010 - Jun 2011

Linux Android Network Systems Lab, Delhi College of Engineering

Software Engineering Intern

Jun 2010 - Aug 2010

Goldman Sachs, Bangalore

Undergraduate Research Intern

Dec 2008 - Jul 2010

Unmanned Aircraft Systems Lab, Delhi College of Engineering

TEACHING EXPERIENCE

Machine Learning

Instructor

Spring 2019

Operating Systems

Instructor

Autumn 2018

Graduate Systems

Instructor

Autumn 2018

Computer Networks (taught by Prof. Dheeraj Sanghi)

Head Teaching Assistant

Winter 2016

Class size of 160, took 1 guest lecture, managed other TAs, evaluations, and tutorials.

Embedded Systems (taught by Dr. Amarjeet Singh)

Teaching Assistant

Winter 2013

Class size of 30, managed labs, evaluations, and took 1 guest lecture.

Introduction to Programming (taught by Dr. Gaurav Gupta)

Head Teaching Assistant

Autumn 2012

Class size of 160, managed other TAs, took 4 guest lectures, labs, evaluations.

PUBLICATIONS (GOOGLE SCHOLAR PROFILE)

Selected Peer-reviewed articles¹

1. Yiling Jia, **Nipun Batra**, Hongning Wang, Kamin Whitehouse
A Tree-Structured Neural Network Model for Household Energy Breakdown
* WWW 2019
2. Haroon Rashid, **Nipun Batra**, Pushpendra Singh
Rimor: Towards Identifying Anomalous Appliances in Buildings
* Buildsys 2018

¹A* or A conferences as per 2018 CORE CS rankings are highlighted using *

3. **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%**)
4. **Nipun Batra**, Hongning Wang, Amarjeet Singh, Kamin Whitehouse
Matrix Factorisation for Scalable Energy Breakdown
* AAAI 2017. San Francisco, USA (**Acceptance rate: 25%**)
5. **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%**)
6. **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%**)
7. **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%, 225+ citations**)
8. **Nipun Batra**, Manoj Gulati, Amarjeet Singh, and Mani Srivastava
It's Different: Insights into home energy consumption in India
* Buildsys 2013, Rome, Italy (**85+ citations**)
9. 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**)

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
(**40+ citations**)
4. **Nipun Batra**, Amarjeet Singh, Pushpendra Singh, Haimonti Dutta, Venkatesh Sarangan, and Mani Srivastava
Data Driven Energy Efficiency in Buildings

SERVICE

Publications Chair

- Buildsys 2018 2018
Shenzen, China

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

- Buildsys 2018 2018
Shenzen, China
- 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

- IIT Gandhinagar, Chaitanya Khoj *AI for school children (300+ students from multiple schools attended)* 2018
- IIT Gandhinagar, Delhi, Bombay, Kanpur; IIIT Hyd; IISC, MSR India *The Billion Building Challenge* 2018
- 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 Mar 2017- Present
Transfer learning for energy breakdown across regions
Co-author
- Anmol Singh, B.Tech. at IIITD Jan 2017 - Aug 2017
Factorisation for scalable energy breakdown
Independent project
- Rishi Baijal, B.Tech. at IIITD Jan 2015 - Dec 2015
Non-intrusive occupancy detection
Bachelor's thesis

Ishaan Malhotra, B.Tech. at DTU
Smart meter based energy disaggregation
Bachelor's thesis

July 2012 - Dec 2013

Ayushi Aggarwal, B.Tech. at IIITD
Reproducible energy disaggregation
Independent project

Jan 2013 - Jul 2013

Akshit Gupta, B.Tech. at IIITD
Appliance energy modelling
Independent project, IIITD

Aug 2012 - Dec 2012