Sustainability Lab Publications

**IIT Gandhinagar**

Generated: 2025-10-30 06:48:42  
Total Publications: 45

# 2025

**VayuBench and VayuChat: Executable Benchmarking and Deployment of LLMs for Multi-Dataset Air Quality Analytics**

**Authors:** Acharya, Vedant and Pisharodi, Abhay and Pasi, Ratnesh and Mondal, Rishabh and Batra, Nipun

**Venue:** *ACM IKDD CODS 2025 - 13th International Conference on Data Science*

**Space to Policy: Scalable Brick Kiln Detection and Automatic Compliance Monitoring with Geospatial Data**

**Authors:** Patel, Zeel B and Mondal, Rishabh and Dubey, Shataxi and Jaiswal, Suraj and Guttikunda, Sarath and Batra, Nipun

**Venue:** *ACM Journal on Computing and Sustainable Societies (JCSS)*

**URL:** https://arxiv.org/abs/2412.04065

**SentinelKilnDB: A Large-Scale Dataset and Benchmark for OBB Brick Kiln Detection in South Asia Using Satellite Imagery**

**Authors:** Mondal, Rishabh and Parab, Jeet and Kubadia, Heer and Dubey, Shataxi and Junagade, Shardul and Patel, Zeel B and Batra, Nipun

**Venue:** *Advances in Neural Information Processing Systems*

**Optimizing Pollutant Exposure, Energy Consumption, and Thermal Comfort in a House via Deep Reinforcement Learning Control**

**Authors:** Mishra, Nishchaya Kumar and Batra, Nipun and Patel, Sameer

**Venue:** *Journal of Building Engineering*

**Constraining the 3HDM parameter space using active learning**

**Authors:** Batra, Nipun and Coleppa, Baradhwaj and Khanna, Akshat and Rai, Santosh Kumar and Sarkar, Agnivo

**Venue:** *Physical Review D*

# 2024

**VayuBuddy: an LLM-Powered Chatbot to Democratize Air Quality Insights**

**Authors:** Patel, Zeel B and Bachwana, Yash and Sharma, Nitish and Guttikunda, Sarath and Batra, Nipun

**URL:** https://arxiv.org/abs/2411.12760

**SpiroActive: Active Learning for Efficient Data Acquisition for Spirometry**

**Authors:** Jain, Ankita Kumari and Sharma, Nitish and Kanda, Madhav and Batra, Nipun

**Venue:** *arXiv preprint arXiv:2410.22950*

**URL:** https://arxiv.org/abs/2410.22950

**JoulesEye: Energy Expenditure Estimation and Respiration Sensing from Thermal Imagery While Exercising**

**Authors:** Adhikary, Rishiraj and Sadeh, Maite and Batra, Nipun and Goel, Mayank

**Venue:** *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*

**DOI:** 10.1145/3654888

**Benchmarking Active Learning for NILM**

**Authors:** Patel, Dhruv and Jain, Ankita Kumari and Khandor, Haikoo and Choudhary, Xhitij and Batra, Nipun

**Venue:** *arXiv preprint arXiv:2411.15805*

**URL:** https://arxiv.org/abs/2411.15805

# 2023

**SpiroMask: measuring Lung function using consumer-grade masks**

**Authors:** Adhikary, Rishiraj and Lodhavia, Dhruvi and Francis, Chris and Patil, Rohit and Srivastava, Tanmay and Khanna, Prerna and Batra, Nipun and Breda, Joseph and Peplinski, Jacob and Patel, Shwetak

**Venue:** *ACM Transactions on Computing for Healthcare*

**DOI:** 10.1145/3570167

**AIRDELHI: Fine-Grained Spatio-Temporal Particulate Matter Dataset From Delhi For ML based Modeling**

**Authors:** Chauhan, Sachin and Patel, Zeel B and Ranu, Sayan and Sen, Rijurekha and Batra, Nipun

**Venue:** *Thirty-seventh Conference on Neural Information Processing Systems Datasets and Benchmarks Track*

**URL:** https://openreview.net/forum?id=dElWgZcqxm

# 2022

**Vastr-GAN: Versatile Apparel Synthesised from Text using a Robust Generative Adversarial Network**

**Authors:** Shastri, Hetvi and Lodhavia, Dhruvi and Purohit, Palak and Kaoshik, Ronak and Batra, Nipun

**Venue:** *CODS-COMAD '22 : 5th Joint International Conference on Data Science \& Management of Data (9th ACM IKDD CODS and 27th COMAD)*

**Samachar: Print News Media on Air Pollution in India**

**Authors:** Patel, Karm and Adhikary, Rishiraj and Patel, Zeel B and Batra, Nipun and Guttikunda, Sarath

**Venue:** *ACM SIGCAS/SIGCHI Conference on Computing and Sustainable Societies (COMPASS) (COMPASS '22)*

**Accurate and Scalable Gaussian Processes for Fine-grained Air Quality Inference**

**Authors:** Patel, Zeel B and Purohit, Palak and Patel, Harsh and Sahni, Shivam and Batra, Nipun

**Venue:** *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-22)*

**"I do not know": Quantifying Uncertainty in Neural Network Based Approaches for Non-Intrusive Load Monitoring**

**Authors:** Bansal, Vibhuti and Khoiwal, Rohit and Shastri, Hetvi and Khandor, Haikoo and Batra, Nipun

**Venue:** *The 9th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2022)*

# 2021

**Vartalaap: what drives \#airquality discussions: politics, pollution or pseudo-science?**

**Authors:** Adhikary, Rishiraj and Patel, Zeel B and Srivastava, Tanmay and Batra, Nipun and Singh, Mayank and Bhatia, Udit and Guttikunda, Sarath

**Venue:** *Proceedings of the ACM on Human-Computer Interaction*

**Neural Network Approaches and Dataset Parser for NILM Toolkit**

**Authors:** Shastri, Hetvi and Batra, Nipun

**Venue:** *8th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (Buildsys)*

**Exploring Hidden Markov Models: An interactive illustration**

**Authors:** Kukunuri, Rithwik and Adhikary, Rishiraj and Jaguste, Mahika Om and Batra, Nipun and Tendulkar, Ashish

**Venue:** *4th Workshop on Visualization for AI Explainability (VISxAI'21)*

# 2020

**PlantDoc: A Dataset for Visual Plant Disease Detection**

**Authors:** Singh, Davinder and Jain, Naman and Jain, Pranjali and Kayal, Pratik and Kumawat, Sudhakar and Batra, Nipun

**Venue:** *ACM India Joint International Conference on Data Science \& Management of Data (CODS-COMAD 2020)*

**Exploring Bayesian Optimization**

**Authors:** Agnihotri, Apoorv and Batra, Nipun

**Venue:** *Distill Journal*

**URL:** https://distill.pub/2020/bayesian-optimization/

**EdgeNILM: towards NILM on edge devices**

**Authors:** Kukunuri, Rithwik and Aglawe, Anup and Chauhan, Jainish and Bhagtani, Kratika and Patil, Rohan and Walia, Sumit and Batra, Nipun

**Venue:** *Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*

**Active Learning: A Visual Tour**

**Authors:** Patel, Zeel B and Batra, Nipun

**Venue:** *3rd Workshop on Visualization for AI Explainability (VISxAI'20)*

# 2019

**Towards reproducible state-of-the-art energy disaggregation**

**Authors:** Batra, Nipun and Kukunuri, Rithwik and Pandey, Ayush and Malakar, Raktim and Kumar, Rajat and Krystalakos, Odysseas and Zhong, Mingjun and Meira, Paulo and Parson, Oliver

**Venue:** *The 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys '19)*

**Demo Abstract: A demonstration of reproducible state-of-the-art energy disaggregation using NILMTK**

**Authors:** Batra, Nipun and Kukunuri, Rithwik and Pandey, Ayush and Malakar, Raktim and Kumar, Rajat and Krystalakos, Odysseas and Zhong, Mingjun and Meira, Paulo and Parson, Oliver

**Venue:** *The 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys '19)*

**Active Collaborative Sensing for Energy Breakdown**

**Authors:** Jia, Yiling and Batra, Nipun and Wang, Hongning and Whitehouse, Kamin

**Venue:** *The 28th ACM International Conference on Information and Knowledge Management (CIKM'2019)*

**A Tree-Structured Neural Network Model for Household Energy Breakdown**

**Authors:** Jia, Yiling and Batra, Nipun and Wang, Hongning and Whitehouse, Kamin

**Venue:** *Proceedings of the 2019 World Wide Web Conference (WWW '19)*

# 2018

**Transferring Decomposed Tensors for Scalable Energy Breakdown across Regions**

**Authors:** Batra, Nipun and Jia, Yiling and Wang, Hongning and Whitehouse, Kamin

**Venue:** *AAAI 2018, Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-18)*

**Rimor: Towards Identifying Anomalous Appliances in Buildings**

**Authors:** Rashid, Haroon and Batra, Nipun and Singh, Pushpendra

**Venue:** *Proceedings of the 5th Conference on Systems for Built Environments (Buildsys 18)*

**DOI:** 10.1145/3276774.3276797

# 2017

**Systems and Analytical Techniques Towards Practical Energy Breakdown for Homes**

**Authors:** Batra, Nipun

**Venue:** *University of Virginia*

**Matrix Factorisation for Scalable Energy Breakdown**

**Authors:** Batra, Nipun and Wang, Hongning and Singh, Amarjeet and Whitehouse, Kamin

**Venue:** *AAAI 2017, Thirty-First AAAI Conference on Artificial Intelligence (AAAI-17)*

# 2016

**Gemello: Creating a Detailed Energy Breakdown from just the Monthly Electricity Bill**

**Authors:** Batra, Nipun and Singh, Amarjeet and Whitehouse, Kamin

**Venue:** *KDD 2016, 22nd ACM SIGKDD conference on knowledge discovery and data mining*

**DOI:** 10.1145/2939672.2939735

**Exploring The Value of Energy Disaggregation Through Actionable Feedback**

**Authors:** Batra, Nipun and Singh, Amarjeet and Whitehouse, Kamin

**Venue:** *3rd International Workshop on Non-Intrusive Load Monitoring*

**Creating a Detailed Energy Breakdown from just the Monthly Electricity Bill**

**Authors:** Batra, Nipun and Singh, Amarjeet and Whitehouse, Kamin

**Venue:** *3rd International Workshop on Non-Intrusive Load Monitoring*

# 2015

**Non Intrusive Load Monitoring: Systems, Metrics and Use Cases**

**Authors:** Batra, Nipun

**Venue:** *Doctoral Colloqium of the 13th ACM Conference on Embedded Networked Sensor Systems (SenSys 2015)*

**If You Measure It, Can You Improve It? Exploring The Value of Energy Disaggregation**

**Authors:** Batra, Nipun and Singh, Amarjeet and Whitehouse, Kamin

**Venue:** *2nd ACM International Conference on Embedded Systems For Energy-Efficient Built Environments (Buildsys 2015)*

**Dataport and NILMTK: A Building Data Set Designed for Non-intrusive Load Monitoring**

**Authors:** Parson, Oliver and Fisher, Grant and Hersey, April and Batra, Nipun and Kelly, Jack and Singh, Amarjeet and Knottenbelt, William and Rogers, Alex

**Venue:** *1st International Symposium on Signal Processing Applications in Smart Buildings at 3rd IEEE Global Conference on Signal and Information Processing*

# 2014

**NILMTK: An Open Source Toolkit for Non-intrusive Load Monitoring**

**Authors:** Batra, Nipun and Kelly, Jack and Parson, Oliver and Dutta, Haimonti and Knottenbelt, William and Rogers, Alex and Singh, Amarjeet and Srivastava, Mani

**Venue:** *5th International Conference on Future Energy Systems (ACM e-Energy)*

**NILMTK v0. 2: A Non-intrusive Load Monitoring Toolkit for Large Scale Data Sets**

**Authors:** Kelly, Jack and Batra, Nipun and Parson, Oliver and Dutta, Haimonti and Knottenbelt, William and Rogers, Alex and Singh, Amarjeet and Srivastava, Mani

**Venue:** *First ACM International Conference on Embedded Systems For Energy-Efficient Built Environments (Buildsys 2014)*

**Data Driven Energy Efficiency in Buildings**

**Authors:** Batra, Nipun and Singh, Amarjeet and Singh, Pushpendra and Dutta, Haimonti and Sarangan, Venkatesh and Srivastava, Mani

**Bits and Watts: Improving energy disaggregation performance using power line communication modems**

**Authors:** Batra, Nipun and Gulati, Manoj and Jain, Puneet and Whitehouse, Kamin and Singh, Amarjeet

**Venue:** *First ACM International Conference on Embedded Systems For Energy-Efficient Built Environments (Buildsys 2014)*

**A comparison of non-intrusive load monitoring methods for commercial and residential buildings**

**Authors:** Batra, Nipun and Parson, Oliver and Berges, Mario and Singh, Amarjeet and Rogers, Alex

# 2013

**It's Different: Insights into home energy consumption in India**

**Authors:** Batra, Nipun and Gulati, Manoj and Singh, Amarjeet and Srivastava, Mani

**Venue:** *5th ACM Workshop On Embedded Systems For Energy-Efficient Buildings (Buildsys 2013)*

**INDiC: Improved Non-Intrusive load monitoring using load Division and Calibration**

**Authors:** Batra, Nipun and Dutta, Haimonti and Singh, Amarjeet

**Venue:** *The 12th International Conference on Machine Learning and Applications (ICMLA'13)*

**Experiences with Occupancy Based Building Management Systems**

**Authors:** Batra, Nipun and Arjunan, Pandarasamy and Singh, Amarjeet and Singh, Pushpendra

**Venue:** *2013 IEEE Eighth International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP '13)*

# 2012

**SensorAct: A Privacy and Security Aware Federated Middleware for Building Management**

**Authors:** Arjunan, Pandarasamy and Batra, Nipun and Choi, Haksoo and Singh, Amarjeet and Singh, Pushpendra and Srivastava, Mani

**Venue:** *BuildSys '12: Proceedings of the Fourth ACM Workshop on Embedded Sensing Systems for Energy-Efficiency in Buildings*

**DOI:** 10.1145/2422531.2422547