

Sudershan Boovaraghavan

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EDUCATION

Carnegie Mellon University

Ph.D. in Computer Science - Societal Computing

Advisor: Yuvraj Agarwal

Pittsburgh, PA

Aug 2018 – Present

GPA: 3.9/4.0

SRM University

B.Tech in Computer Science and Engineering

Chennai, India

Jun 2012 – Jun. 2016

SELECTED AWARDS AND HONORS

CMU CyLab Presidential Fellowship

2023

Best Demo Award, BuildSys'20

2020

PUBLICATIONS

- [6] **Sudershan Boovaraghavan**, Haozhe Zhou, Mayank Goel, and Yuvraj Agarwal. 2024. Kirigami: Lightweight Speech Filtering for Privacy-Preserving Activity Recognition using Audio. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 8, 1, Article 36 (March 2024), 28 pages.
- [5] **Sudershan Boovaraghavan**, Prasoon Patidar, and Yuvraj Agarwal. 2023. TAO: Context Detection from Daily Activity Patterns Using Temporal Analysis and Ontology. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 7, 3, Article 87 (September 2023), 32 pages.
- [4] **Sudershan Boovaraghavan**, Chen Chen, Anurag Maravi, Mike Czapik, Yang Zhang, Chris Harrison, and Yuvraj Agarwal. 2023. Mites: Design and Deployment of a General-Purpose Sensing Infrastructure for Buildings. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 7, 1, Article 2 (**UbiComp '23**), 32 pages.
- [3] Abdelkareem Bedri, Yuchen Liang, **Sudershan Boovaraghavan**, Geoff Kaufman, and Mayank Goel. 2022. FitNibble: A Field Study to Evaluate the Utility and Usability of Automatic Diet Monitoring in Food Journaling Using an Eyeglasses-based Wearable. In *27th International Conference on Intelligent User Interfaces (IUI '22)*. ACM, New York, NY, USA, 7992.
- [2] **Sudershan Boovaraghavan**, Anurag Maravi, Prahaladha Mallela, and Yuvraj Agarwal. 2021. MLIoT: An End-to-End Machine Learning System for the Internet-of-Things. In *Proceedings of the International Conference on Internet-of-Things Design and Implementation (IoTDI '21)*. ACM, New York, NY, USA, 169181.
- [1] Jason Koh, Dezhi Hong, Shreyas Nagare, **Sudershan Boovaraghavan**, Yuvraj Agarwal, and Rajesh Gupta. 2019. Who can Access What, and When? Understanding Minimal Access Requirements of Building Applications. In *Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys '19)*. ACM, New York, NY, USA, 121124.

PREPRINTS

- [1] Matuš Tomlein, **Sudershan Boovaraghavan**, Yuvraj Agarwal, and Anind K. Dey. Supporting Maintenance Operations for IoT-Based Activity Recognition Using Transfer Learning. arXiv preprint (2018).

POSTERS & DEMOS

- [3] Matilda Kathryn Ferguson, **Sudershan Boovaraghavan**, and Yuvraj Agarwal. 2020. Vista: Spatial Data Representation for Smart Buildings. In Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (**BuildSys '20**). Association for Computing Machinery, New York, NY, USA, 342343. [**Best Demo Award**]
- [2] **Sudershan Boovaraghavan**, Chen Chen, Dohyun Kim, Yuvraj Agarwal, GIoTTO: A Safe, Secure and Easy to Use IoT Stack for Buildings, CMU Energy Week, March 2018, Pittsburgh, PA, USA.
- [1] Matúš Tomlein, **Sudershan Boovaraghavan**, Yuvraj Agarwal, and Anind K. Dey. 2017. CharIoT: an end-user programming environment for the IoT. In Proceedings of the Seventh International Conference on the Internet of Things (**IoT '17**). ACM, New York, NY, USA, Article 25, 12.

PATENTS

- [1] Yuvraj Agarwal, Christopher Harrison, Gierad Laput, **Sudershan Boovaraghavan**, Chen Chen, Abhijit Hota, Bo Robert Xiao, and Yang Zhang. "Virtual sensor system." U.S. Patent Application 16/591,987, filed January 30, 2020. (**Accepted**)

RESEARCH EXPERIENCE

- **Software and Societal Systems, Carnegie Mellon University** Pittsburgh, PA
Research Assistant (Ph.D. student) || Advisor: Yuvraj Agarwal *Aug 2018 – Present*
 - I work on different research topics broadly in IoT, ubiquitous sensing systems, privacy, security, and applied machine learning.
- **Carnegie Mellon University** Pittsburgh, PA
Research Associate || Advisor(s): Yuvraj Agarwal and Anind Dey *Jan 2016 – Aug 2018*
 - Led and developed various IoT systems that include a building operating system called [BuildingDepot](#), a sensing system known as [Mites](#), and an IoT platform known as [GIoTTO](#).
- **National Internet Exchange of India (NIXI) and SRM** Chennai, India
Researcher || Mentor: D. Narayana Rao *Dec 2013 – Dec 2015*
 - Designed and implemented a cluster-based [search engine](#) tailored towards Indian websites and languages.

TEACHING EXPERIENCE

- Teaching Assistant, Carnegie Mellon University** Pittsburgh, PA
17-422/722,05-499/899: Building User-Focused Sensing Systems (Undergraduate & Graduate) *Spring 2020*
- Teaching Assistant, SRM University** Chennai, India
CS 238: Introductions to Computer Networks *Spring 2015*

TECHNICAL SKILLS

- **Programming Languages:** C, C++, Java, Python, HTML, CSS, PHP, Javascript, Node.js, Vue.js
- **Machine Learning Tools:** TensorFlow, PyTorch, Keras, Scikit-learn

SELECTED INVITED TALKS AND PRESENTATIONS

- Ubicomp**, Context detection from daily activity patterns 2023
- Ubicomp**, Mites: General-Purpose Sensing Infrastructure for Buildings 2023
- CyLab Partners Conference**, Mites: General-Purpose Sensing Infrastructure for Buildings 2022,2023
- IoTDI Conference**, Building Machine Learning Systems for the Internet-Of-Things 2021

CyLab Partners Conference , Towards Safe and Secure Internet-Of-Things infrastructure	2020
BuildSys Conference , Spatial Data Representation for Smart Buildings	2020
CMU Scott Institute for Energy Innovation , Sensors in IoT	2018
CMU Energy Week , Safe, Secure and Easy to Use Building Infrastructure for IoT	2018
CMU 50th Anniversary Expo , Towards Building a Safe and Secure IoT Infrastructure	2017

ACADEMIC SERVICE

External Reviewer:

ACM IMWUT	2021, 2022
ACM CHI	2022, 2023
ACM CHI LBW	2023
ACM CHI Play	2023
IEEE ISMAR	2023

SELECTED PRESS

ACM Communications , <i>Privacy Battle Erupts Over Smart Building Sensors</i>	2023
MIT Tech Review , <i>Computer scientists designing the future cant agree on what privacy means</i>	2023
Carnegie Mellon , <i>Sensors to detect that a dementia patient is having symptoms they can't remember</i>	2018
New Atlas , <i>Single Synthetic Sensor keeps watch over entire room</i>	2017
Digital Trends , <i>Synthetic Sensors create a connected home without adding smart devices</i>	2017
Engadget , <i>A smart home mega sensor can track what goes on in a room</i>	2017
TechCrunch , <i>Google-funded super sensor project brings IoT powers to dumb appliances</i>	2017

ACADEMIC MENTEES

Anurag Maravi , <i>Undergraduate, Computer Science, (Currently pursuing Masters at USC)</i>	2017 - Present
Mike Czapik , <i>Research Scientist, (Currently at TikTok)</i>	2017 - 2023
Suryaa Selvaraj , <i>CMU Masters, ECE</i>	2022 - 2023
Bingchen Li , <i>CMU Undergraduate, Computer Science</i>	2022 - 2023
Lucas Blanchard , <i>REU Student, (Joining Masters at CMU)</i>	2022
Shreyas Nagare , <i>SRM Undergraduate, CMU Masters, Computer Science, (Currently at Apple)</i>	2017 - 2020
Abhijith Raghav , <i>Undergraduate, Computer Science, (Currently at Amazon)</i>	2017 - 2020
Matilda Fergurson , <i>REU Student</i>	2019
Kunal Bhuwarka , <i>Undergraduate, Computer Science, (Currently at Apple)</i>	2017 - 2018
Prahal Mallela , <i>Undergraduate, Computer Science, (Currently at Google)</i>	2017 - 2018

REFERENCES

Yuvraj Agarwal	Associate Professor, School of Computer Science, Carnegie Mellon University
Chris Harrison	Associate Professor, School of Computer Science, Carnegie Mellon University
Mayank Goel	Associate Professor, School of Computer Science, Carnegie Mellon University