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## Research Interest

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My research interest broadly focuses on building novel activity recognition pipelines for nearable sensing devices. I focus on activity monitoring in smart homes, by observing data collected from residents in smart homes using nearable sensors. As such I propose a **“lifespan” of a human activity recognition system in smart homes**, which includes (a) initial bootstrapping procedure - aimed at ‘jump-starting’ the activity recognition system in the home, with minimal supervision from the resident; (b) updating and extending the activity recognition system - aimed at improving the recognition capabilities of the initial bootstrapped system; (c) routine assessment - aimed at behavior monitoring of residents over extended periods of observation.

## Education

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Aug '18 - Dec '24 (expected)	<b>Ph.D.</b> in Computer Science GEORGIA INSTITUTE OF TECHNOLOGY THESIS: “Deriving Bespoke Human Activity Recognition Systems for Smart Homes” DOCTORAL COMMITTEE: Thomas Plötz (Advisor), Sonia Chernova, Diane Cook, Gregory Abowd, Uichin Lee	ATLANTA, GA
Aug '15 - May '17	<b>M.S.</b> in Computer Science GEORGIA INSTITUTE OF TECHNOLOGY	ATLANTA, GA
Aug '10 - July '14	<b>B.Tech</b> in Computer Science VIT UNIVERSITY	VELLORE, INDIA

## Publications

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Refereed Conference, Journal and Workshop Papers

- P1. **Shruthi K. Hiremath** and Thomas Plötz.(2024). Game of LLMs: Discovering Structural Constructs in Activities using Large Language Models. Arxiv (Under Review).
- P2. Sourish Dhekane, Megha Thukral, **Shruthi K. Hiremath**, Harish Haresamudram and Thomas Plötz.(2024). Layout Agnostic Human Activity Recognition in Smart Homes through Textual Descriptions Of Sensor Triggers (TDOST). Arxiv (Under Review).

- P3. **Shruthi K. Hiremath** and Thomas Plötz.(2024).Maintenance Required: Updating and Extending Bootstrapped Human Activity Recognition Systems for Smart Homes. The 6<sup>th</sup> International Conference on Activity and Behavior Computing (ABC).
- P4. **Shruthi K. Hiremath** and Thomas Plötz.(2023).The Lifespan of Human Activity Recognition Systems for Smart Homes. *Sensors* 2023, 23(18), 7729; DOI: [10.3390/s23187729](https://doi.org/10.3390/s23187729)
- P5. **Shruthi K. Hiremath**, Yasutaka Nishimura, Sonia Chernova and Thomas Plötz.(2022). Bootstrapping Human Activity Recognition Systems for Smart Homes from Scratch. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 6(3), 1-27; DOI: [10.1145/3550294](https://doi.org/10.1145/3550294)
- P6. Yulai Cui, **Shruthi K. Hiremath** and Thomas Plötz (2022). ROAR: Reinforcement Learning Based Online Active Learning for Human Activity Recognition. In 2022 International Symposium on Wearable Computers (ISWC) (pp. 2327); DOI: [10.1145/3544794.3558457](https://doi.org/10.1145/3544794.3558457)
- P7. Mindy Scheithauer, **Shruthi K. Hiremath**, Audrey Southerland, Agata Rozga, Thomas Plötz, Chelsea Rock, Nathan Call (2022). Feasibility of accelerometer technology with individuals with autism spectrum disorder referred for aggression, disruption, and self-injury. *Research in Autism Spectrum Disorders*, 98, 102043; DOI: [10.1016/j.rasd.2022.102043](https://doi.org/10.1016/j.rasd.2022.102043)
- P8. **Shruthi K. Hiremath** and Thomas Plötz. (2021). On the Role of Context Length for Feature Extraction and Sequence Modeling in Human Activity Recognition. In 2021 International Symposium on Wearable Computers (ISWC) (pp. 13-17); DOI: [10.1145/3460421.3478825](https://doi.org/10.1145/3460421.3478825)
- P9. **Shruthi K. Hiremath** and Thomas Plötz.(2020). Deriving effective human activity recognition systems through objective task complexity assessment. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 4(4), 1-24; DOI: [10.1145/3432227](https://doi.org/10.1145/3432227)
- P10. **Shruthi K. Hiremath**, Pallavi Chandra, Anne M. Joy, and B. K. Tripathy (2015). Neighborhood rough set model for knowledge acquisition using MapReduce. *International Journal of Communication Networks and Distributed Systems (IJCNDs)*, 15(2-3), 212-234; DOI: [10.1504/IJCNDs.2015.070975](https://doi.org/10.1504/IJCNDs.2015.070975)
- P11. **Shruthi K. Hiremath** and Govinda K( 2014). Rainfall Prediction Using Artificial Neural Network. *International Journal Applied Engineering Research*, 9, (pp. 21243-21254).

## Professional Experience

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AUG '24 - Nov '24	<b>PhD AI Intern</b> Optum Tech AI/ML division of Optum Technology  Working on technologies for health monitoring.
AUG '18 - JUL '24	<b>Graduate Research Assistant</b> Georgia Institute of Technology  I developed data-driven technologies for wearable and nearable based application scenarios to build deployable human activity recognition systems, with a focus on providing health monitoring.
MAY - JULY '16	<b>Data Science Intern</b> ADP  My work involved development of data analysis procedures to analyze and gather insights from collected payroll data.
AUG '14 - JULY '15	<b>Software Developer</b> Deloitte USI (Hyderabad, India)  I was involved in building a tool that served as an interface between end users and project management activities(PMC) aimed as reducing the number of manual tickets raised for changes to a project team. The tool successfully contributed to a 70% reduction in costs associated with handling tickets, thereby achieving significant cost savings.

## Teaching Experience

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	<b>Teaching Assistant</b>	
Summer '19, '20, '21	CS 6601: Artificial Intelligence	GEORGIA INSTITUTE OF TECHNOLOGY
Summer '22	CS 7470: Mobile & Ubiquitous Computing	GEORGIA INSTITUTE OF TECHNOLOGY
Fall '16, '17	CS 4400: Database Systems	GEORGIA INSTITUTE OF TECHNOLOGY

## Funding

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2019 - 2020	<b>Georgia Clinical and Translational Science Alliance Grant</b> (PI: Dr. Thomas Plötz), \$15,000 <a href="#">[Read More]</a> . Optimizing context length for improved activity recognition in wearable sensing.	LEAD RESEARCHER
2018 - 2019	<b>Pilot Grant from NIH</b> via <b>Georgia Institute of Technology</b> (PI: Dr. Thomas Plötz) Analyzing the feasibility of using accelerometers to identify episodes of server behavior in youth on the Autism Spectrum Disorder (ASD)	LEAD RESEARCHER

2022 - 2024 **Collaboration with KDDI Corporation** (PI: Dr. Thomas Plötz and Dr. Sonia Chrunova)  
Novel Human-in-the-Loop Learning for realization of real-world AI LEAD RESEARCHER

## Awards and Recognitions

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2023	<b>N<sup>2</sup> Women Young Research Fellowship (\$1000)</b> , Percom 2023
2022	<b>Student Travel Grant (\$500)</b> , Ubicomp 2022 (by Georgia Institute of Technology)
2021	<b>N<sup>2</sup> Women Young Research Fellowship (\$1000)</b> , Ubicomp 2021
2019	<b>Imlay pre-proposal selected</b> , Georgia Tech
2015, 2018, 2021	<b>Grace Hopper Scholar</b> , Georgia Tech
2014	<b>Merit Scholar</b> , VIT University

## Invited Talks

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2024	Maintenance Required: Updating and Extending Bootstrapped Human Activity Recognition Systems in Smart Homes @ ABC (International Conference on Activity and Behavior Computing)
2022	ROAR: Reinforcement Learning Based Online Active Learning for Human Activity Recognition @ Ubicomp
2022	Bootstrapping Human Activity Recognition Systems for Smart Homes from Scratch @ Ubicomp
2021	Deriving effective human activity recognition systems through objective task complexity assessment @ Ubicomp
2021	On the Role of Context Length for Feature Extraction and Sequence Modeling in Human Activity Recognition @ Ubicomp
2018	Detecting severe behavior episodes in youth on the Autism Spectrum Disorder @ Georgia Tech

## Professional Service

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	<b>Reviewer</b>
2018 - 2024	ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
2024	UbiComp Posters and Demos
2024	UbiComp/ISWC 2024 Workshop on AI-infused Physical Systems
2024	Nordic Conference on Human-Computer Interaction (NordiCHI)
2023	Workshop on Ubiquitous and Multi-domain User Modeling (UMUM)

2022	International Conference on Pervasive Computing and Communications (Percom)
2021	ACM Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD)
2023	<p><b>Program Committee Member</b>  Served on the Program Committee for ‘The Second Workshop on Ubiquitous and Multi-domain User Modeling (UMUM2023)’. Held in Conjunction with PerCom 2023. <a href="#">[Read More]</a></p>

## Community Service

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2018 - present	<b>Mentor</b> , Georgia Tech: mentored undergraduate and graduate student interested in research
2023	<b>N<sup>2</sup> Women Event</b> , Percom 2023
2022	<b>Organizing Committee (Web Chair)</b> , Ubicomp 2022
2021	<b>N<sup>2</sup> Women Event</b> , Ubicomp 2021
2020 - 2023	<b>Social Chair</b> , Ubicomp Lab @ Georgia Tech
2015 - 2022	<b>Volunteer</b> , India Club @ Georgia Tech
2010 - 2014	<b>Core Member</b> , Robotics Club @ VIT University