# SAVITHA VISWANADH KANDALA

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## EDUCATION

**Ph.D in Computer Science,**
*National University of Singapore (NUS)* Fall 2024 intake
Advisor: Dr. Ambuj Varshney

**B.Tech. and M.S. by Research in Electronics and Communication Engineering,**
*International Institute of Information Technology, Hyderabad (IIIT-H)*
CGPA: 9.01/10.0 2019-2024
Advisor: Dr. Sachin Chaudhari

## RESEARCH EXPERIENCE

**National University of Singapore** Aug 2024 - Present
Graduate Researcher

- Developed a framework for training custom, smaller language models (SLMs) optimized for custom user data.
- Trained 30-120M SLMs on curated datasets, performing at par with Phi 3 and Llama 3 on specific IoT usecases.
- Created custom datasets of 10B tokens consisting web, sensor and coding data for training smaller models.
- 2000+ GPU hours of training and fine-tuning SLMs for IoT data analysis.

**National University of Singapore** Jan 2024 - Jun 2024
Visiting Scholar

- Benchmarked performance of LLMs (Phi, Gemma, and Llama) on various single-board computers.
- Analyzed the capabilities of fine-tuned LLMs for wireless sensing and sensor datasheet interpretation.
- Explored distributed inference of the Llama model across multiple single-board computers.

**Signal Processing and Communications Research Centre, IIIT-H** Dec 2020 - Jan 2024
Undergraduate Researcher

- Developed a low-cost remote labs solution - RLabs with 5+ hardware experiments.
- Collaborated with 6 professors, led a team of 5 research students and 15 interns.
- Agastya (NGO) has utilised the platform to educate over 300 rural Indian students.
- Previously, performed a security analysis on a large-scale IoT-based air pollution monitoring deployment.

## PUBLICATIONS

- *"TinyLLM: A Framework for Training and Deploying Language Models at the Edge Computers"*
  **K. S. Viswanadh** et al., ArXiv 2024
- *"A Framework for Training and Deploying Foundational Language Models for Embedded Sensing"*
  **K. S. Viswanadh** et al., ACM MobiCom S3 Workshop 2024
- "*Engineering Affordable and Scalable Remote Labs using IoT-based Retrofitting*"
  **K. S. Viswanadh** et al., IEEE Access 2024
- "CV and IoT-based Remote Triggered Labs: Use Case of Conservation of Mechanical Energy"
  **K. S. Viswanadh** et al., IEEE FiCloud 2022
- "Using Miniature Setups and Partial Streams for Scalable Remote Labs"
  Animesh Das, **K. S. Viswanadh** et al., IEEE FiCloud 2023
- "Security Analysis of Large Scale IoT Network for Pollution Monitoring in Urban India"
  G. V. Ihita, **K. S. Viswanadh** et al., IEEE WF-IoT 2021

## POSTERS & PATENTS

- *"POSTER: Your Data, Your Model: A Framework for Training and Deploying Foundational Language Models for Embedded Devices"*
  **K. S. Viswanadh** et al., accepted at ACM MobiCom 2024
- *"POSTER: Simplifying the Networking of Wireless Embedded Systems using a Large Language Model"*
  P Medaranga*, D Shah*, **K. S. Viswanadh*** et al., ACM SIGCOMM 2024
- *"System and method for implementing an experiment remotely and determining an output using a computer vision model"*, US Patent App. 18/241,852, 2024
- *"Refraction Detection Rod"*, Indian Design Patent App. 389763-001, 2023

## OTHER EXPERIENCES

**Walmart Global Tech India** May 2023 - July 2023
Software Developer Intern

- Built a RetinaNet-based retail object detector using Vision Transformer and FAISS, for identifying retail items.
- 30+ objects were successfully recognised from single images with $\geq$95% accuracy.

**Teaching Assistant** for Electronics Workshop IIIT-H, Spring 2023
**Teaching Assistant** for Embedded Systems Workshop IIIT-H, Monsoon 2022
**Teaching Assistant** for Value Education IIIT-H, Spring 2022
**Teaching Assistant** for Communications and Controls in IoT IIIT-H, Monsoon 2021
**Teaching Assistant** for Statistical Methods in AI (selected) IIIT-H, Monsoon 2023

## AWARDS & ACHIEVEMENTS

- ACM Mobicom 2024 Travel Grant
- NUS PhD Research Scholarship Awardee - 2024
- TIH-IoT CHANAKYA Fellow '2022-2023
- Institute's Best All-Rounder Award - 2023 (IIIT-H)
- Dean's (2019-23) & Research List (2021-22) (IIIT-H)
- Best Poster Award at IIIT-H's R&D Showcase 2022
- Solved 'IBM Ponder This' - July, Aug, Sept 2023; May, July 2022 (First Indian to solve in May 2022)

## ACTIVITIES

- Head at Electronics and Robotics Club, IIIT-H and NSS chapter of IIIT-H
- Coordinator at Student Placement Committee, IIIT-H
- Secretary at Mess Committee, IIIT-H
- Volunteer at Asha Kiran, an organisation for educating under-privileged students
- Open-source contributions: TinyLLM, Tensorflow, GSConnect, ESP8266_deauther, w64devkit

## SKILLS

**Programming** C/C++ , Python, Bash, Matlab, Java, HTML, JavaScript, P4, Verilog
**Others** Linux, Git, Slurm, Docker, LaTeX, Wireshark, Embedded Boards