

Kanav Sabharwal

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RESEARCH INTERESTS

- Passionate about advancing **Wireless Networking** systems through the application of **AI** techniques.
- Current research focuses on enhancing the **Physical Layer** capabilities of wireless networks using AI to improve network performance and reliability.
- Master's thesis involved developing an adversarial machine learning-based defence solution to enhance IoT network **security**.

EDUCATION

- **National University of Singapore** **Jan 2022 - Present**
 - Doctor in Philosophy (Ph.D.) - Computer Science
 - GPA: 5/5
 - Advisor: [Dr. Mun Choon Chan](#) and [Dr. Dinil Mon Divakaran](#)
 - Research Direction: ML for Wireless Networks, ML enhanced Radio Systems
 - Graduate Courses: Advanced Topics in AI, Network Security, Advanced Topics in Networking, Exploration in CS Research
- **National University of Singapore** **Aug 2020 - Dec 2021**
 - Master of Computing (AI Specialization)
 - GPA: 4.83/5
 - Advisor: [Dr. Dinil Mon Divakaran](#)
 - Thesis: Bandwidth Tunable Defence to Improve IoT network Security using Adversarial Machine Learning
 - Graduate Courses: AI Planning and Decision Making, Uncertainty Modeling in AI, Neural Networks and Deep Learning, Natural Language Processing, Information Visualisation, Knowledge Discovery and Data Mining
- **Vellore Institute of Technology, Vellore** **Jul 2016 - Jul 2020**
 - Bachelor of Technology (Information Technology)
 - GPA: 9.05/10

CONFERENCE PUBLICATIONS

- **Enhancing LoRa Reception with Generative Models: Channel-Aware Denoising of LoRaPHY Signals**
[Under Submission]
Kanav Sabharwal, Soundarya Ramesh, Jingxian Wang, Dinil Mon Divakaran, Mun Choon Chan
- **EGAL: Enhancing LoRa Network Lifetime with Load Balancing**
[Under Submission]
Malaika Afra Taj, Kanav Sabharwal, Mun Choon Chan
- **Attacking logo-based phishing website detectors with adversarial perturbations**
[ESORICS '23]
Jehyun Lee, Zhe Xin, Melanie Ng Pei See, Kanav Sabharwal, Giovanni Apruzzese, Dinil Mon Divakaran
- **Testing Masks and Air Filters With Your Smartphones**
[SENSYS '23]
Bangjie Sun, Kanav Sabharwal, Gyuyeon Kim, Mun Choon Chan, Jun Han
- **iPET: privacy enhancing traffic perturbations for secure IoT communications**
[PETS '23]
Akshaye Shenoi, Prasanna Karthik Vairam*, Kanav Sabharwal*, Jialin Li, Dinil Mon Divakaran*
**Authors contributed equally*

EXPERIENCE

- **Student Researcher** **Nov 2020 - Jul 2021**
 - NUS-Singtel Cyber Security R&D Lab, Singapore
 - Researched and developed an innovative defence mechanism to enhance IoT network security through Adversarial Machine Learning techniques.
 - Implemented advanced device fingerprinting attack models to assess defence's effectiveness across various scenarios. The defence mechanism with a tunable bandwidth overhead, substantially improves privacy compared with existing approaches.
 - Published research findings as primary author to an A-rank conference.

- **Machine Learning Intern** Dec 2019 - Jun 2020
6D Technologies, Bangalore, India
 - Collaborated with the R&D team to develop an ML-based ‘SMS Firewall’ capable of classifying spam and A2P messages within the network with 98% accuracy, while minimizing false positives—a critical aspect given the nature of the application.
 - Developed a ‘SIM Box Detector’ by optimizing the analysis of network statistics.
- **Academic Intern** Jun 2019
Hewlett Packard Enterprise (HPE) and NUS, Singapore
 - Ranked among the top students in the academic program focused on ‘Big Data Analytics using Artificial Neural Networks.’ Led a team of 5 members on various group projects as part of the curriculum. Received a Letter of Recommendation (LOR) for outstanding performance.
- **Summer Intern** May 2019
Nokia, Gurgaon, India
 - Explored various telecom technologies such as 4G and 5G. Involved in a project focused on analyzing network traffic generated by IoT devices.

TEACHING EXPERIENCE

- Teaching Assistant : **CS5229**- Advanced Computer Networks w/ [Dr. Mun Choon Chan](#)
Fall 2022, Fall 2023, Fall 2024
- Teaching Assistant : **CS5422/4222**- Wireless Networking w/ [Dr. Ambuj Varshney](#)
Spring 2023, Spring 2024
- Teaching Assistant : **CS5346**- Information Visualisation w/ [Dr. Bimlesh Wadhwa](#)
Spring 2022

PROFESSIONAL SERVICE

- **Contributed Reviews (Sub-Reviewer)**
Conferences: ICNP 2023, SenSys 2024

HONORS AND CERTIFICATIONS

- Graduate Research Scholarship, National University of Singapore
- Letter of Recommendation from the Assistant Vice President of Product Development at 6D Technologies, recognizing contributions to the R&D team in developing an AI-based ‘SMS Firewall’.
- GAIP Scholarship for ranking among the top students in the Global Academic Internship Program 2019 at the National University of Singapore. Received a Letter of Recommendation from HPE for outstanding performance and a Letter of Evaluation from NUS with an A+ grade.
- Coursera Courses Completed: Machine Learning by Andrew Ng | Neural Networks and Deep Learning | Text Retrieval and Search Engines | Cloud Computing Applications, Part 1: Cloud Systems and Infrastructure
- Merit-based scholarship across all 8 semesters at VIT Vellore.
- Gold Medal awarded for being top performer (scholar) throughout senior secondary school.

EXTRA CURRICULAR ACTIVITIES

- Core Member, Indian Society for Technical Education: Managed technical events, led a team of volunteers, and secured funding for various initiatives.
- Core Member, FEPSI (NGO): Mentored underprivileged students by combining academic programs with engaging activities as part of outreach efforts.
- Coordinated technical events and fests, including Horizon’17 and GraVITas’17. Volunteered for the Events and Cultural Committee at Riviera’18.

SKILLS

- **Technical Skills:** Machine Learning, Generative AI, LoRaPHY, Signal Processing, Software Defined Radio(SDR)
- **Languages and Frameworks:** C/C++, Python, PyTorch, TensorFlow, GNURadio
- **Soft Skills:** Quick Learner, Team Player, Leadership, Event Management, Writing