Avishek Banerjee

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TECHNICAL SKILLS

Programmming : Java • Matlab • Python • C • C++
Javascript • CSS • PHP (Over 5000 lines)
Platform : React, Node.js, OpenWrt , WARP, 8085, Elastic Search, Grafana, Agile, Docker, Wireshark, Linux Kernel
Familiar : • Android • MySQL • Typescript
General : Data Structures, Algorithm, Object Oriented Programming

EDUCATION

The Ohio State University, Columbus, OH, USA
• PhD, Computer Science and Engineering(CSE)
Expected March, 2023
• Masters, Computer Science and Engineering(CSE)
May 2022 CGPA: 3.89/4.00

Jadavpur University, Kolkata, India
BE in Electronics and Tele Communication,
July 2017 CGPA: 9.4/10.0

EXPERIENCE

Research Scientist
Nokia Bell Labs (Decentralized Systems Research) April 2023 - Present
• Developing innovating wireless sensing systems

Graduate Researcher: CO-SY-NE Group
The Ohio State University 2017-2023

PhD SWE Intern
Meta (Facebook), Menlo Park May 2022 - July 2022
• Worked with Facebook Connectivity (Wireless Platforms and Protocols Team)
• Designed and developed software for supporting modern wireless technologies
Technologies: *Linux Kernel, C, C++, Python*

Graduate Teaching Assistant
The Ohio State University August 2017 – July 2019

MITACS Globalink : Research Internship
Ryerson University, Toronto, Canada May - July 2016
Worked for 12 weeks on developing a game theoretic model for smart grids.

PUBLICATIONS
Google Scholar

- **HORCRUX:** Accurate Cross Band Channel Prediction. Avishek Banerjee, Xingya Zhao, Vishnu Chhabra, Kannan Srinivasan, Srinivasan Parthasarathy, **MobiCom 2024**, 30th Annual International Conference On Mobile Computing And Networking. Paper Link
- **Fewer Demands, More Chances:** Active Eavesdropping in MU-MIMO Systems. Xingya Zhao, Anwesha Roy, Avishek Banerjee, and Kannan Srinivasan. 2024. In Proceedings of the 17th ACM Conference on Security and Privacy in Wireless and Mobile Networks (**WiSec 2024**). Association for Computing Machinery, New York, NY, USA, 162–173. Paper Link
- **RFTemp:** Monitoring Microwave Oven Leakage to Estimate Food Temperature. **UbiComp/IMWUT**, Proc. 2022 ACM Interact. Mob. Wearable Ubiquitous Technol. 5, 4, Article 144 (Dec 2021), 25 pages. Paper Link
- **WiNE:** Monitoring Microwave Oven Leakage to Estimate Food Nutrients and Calorie. **UbiComp/IMWUT**, Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 6, 3, Article 99 (September 2022), 24 pages. Paper Link

- **ReFleX:** Enabling Full Duplex Relay Cluster. 2023 15th International Conference on COMmunication Systems & NETworkS (**COMSNETS**) Paper Link [Best All-round Paper 1st Runners-up]
- **PROWESS:** An Open Testbed for Programmable Wireless Edge Systems. 2022 ACM Practice and Experience in Advanced Research Computing (**PEARC**) Paper Link
- Enabling Detection of Plastic Debris on Water Surface Using Wireless Signals, A. Mahanti, A. Banerjee and K. Srinivasan, **IEEE Sensors Letters**, vol. 5, no. 7, pp. 1-4, July 2021, Art no. 3500904. Paper Link
- Optimal scheduling of distributed energy resources in energy market, S. Basu, S. Ghosh, A. Banerjee and U. Maulik, 2015 Annual IEEE India Conference (**INDICON**), New Delhi, India, 2015, pp. 1-6. Paper Link

PATENTS

- Monitoring Microwave Oven Leakage to Estimate Food Temperature and Food Composition. Avishek Banerjee, Kannan Srinivasan. Provisional Patent Filed
- A Method for Accurate CrossBand Channel Prediction. Avishek Banerjee, Srinivasan Parthasarathy, Kannan Srinivasan. Provisional Patent Filed
- Trustless Subscriber Reidentification ans SIM Swap Prevention Using Biometrics and Blockchains. Novak Boskov, Akshay Jajoo, Avishek Banerjee, Nirupama Ravi. Patent under Filing
- Opti-Vision: A smart glass system for passive testing to determine a profile for a user's light adaptivity to personally tune display brightness settings. Avishek Banerjee, Marja Pauliina Salmimaa. Patent under Review
- AquaLink: A smart-device Duo for Instant Water Contaminants' Detection. Fadoua Khmaissia, Marja Pauliina Salmimaa, Nirupama Ravi, Avishek Banerjee. Patent under Review
- Lane Changer : Dynamic Notification for Manual Navigation Based on External Context. Avishek Banerjee, Nirupama Ravi, Kedar Namjoshi, Fadoua Khmaissia, Ziyi Huang, Sahil Tikale Patent under Review
- AirSearch Navigator: An Interactive, Context-Aware System for Seamless Audio Navigation and Search. Fadoua Khmaissia, Nirupama Ravi, Sahil Tikale, Avishek Banerjee, Akanksha Atrey. Patent under Review
- RF Blockage Predictor: Predicts the type of blockages in the wireless path and fine-tunes the path-loss models to improve the efficiency and accuracy of the localization. Avishek Banerjee, Nirupama Ravi. Patent under Review

TALKS

- ReFleX: Enabling Full Duplex Relay Cluster. Bengaluru, India COMSNETS 2023. Best Paper Runner's Up. Conference Talks
- WiNE: Monitoring Microwave Oven Leakage to Estimate Food Nutrients and Calorie. Georgia Tech University, USA IMWUT 2022. Conference Talks
- RFTemp: Monitoring Microwave Oven Leakage to Estimate Food Temperature, Georgia Tech University, IMWUT 2021. Conference Talks
- Topic : Estimating Food Temperature and Nutrients by Monitoring Microwave Oven Leakage, The Ohio State University, USA. Invited Talks

HONORS AND ACTIVITIES

- 2024: Reviewer IEEE LANMAN 2024
- 2024: Mentored LockGuard (winner of UPitchNJ)
- 2023-24: Mentored Summer Interns
- 2023: Reviewer IEEE ICECET
- 2023: Best All-round paper 1st runners up COMSNETS 2023
- 2022: Interviewed and research covered by New Scientist Magazine
- 2020: Quinlan – Graduate Teaching Award
- 2017: Qualified for the prototype round of WINS Challenges
- 2016: Selected for Mitacs Globalink Research Internship

RESEARCH

Passive Self-Calibrating Water Meters
Nokia Bell Labs 2023 - Ongoing
Working with Decentralized System Research team to develop an innovative sensing system to measure water flow rates through pipes.
Technologies: *Python, IoT*

Cross-band Channel Prediction
The Ohio State University 2022 - 2023
Worked with Prof Kannan Srinivasan and Prof Srinivasan Parthasarathy to use Neural Network models to predict cross-band wireless channels for MU-MIMO.
Technologies: *Python, USRP, WARP*

Active Eavesdropping in MU-MIMO Systems.
The Ohio State University 2022 - 2023
Worked with Prof Kannan Srinivasan and Xingya Zhao to develop active eavesdropping for MU-MIMO.
Technologies: *Python, USRP, WARP*

Monitoring Microwave Oven Leakage to Estimate Food Temperature
The Ohio State University May 2020 - May 2021
Worked with Prof Kannan Srinivasan, on developing a wireless system to estimate the food temperature inside the microwave oven by sensing the microwave leakage through the oven window. Patent submitted.
Technologies: *WARP, MATLAB*

Monitoring Microwave Oven Leakage to Estimate Food Nutrients
The Ohio State University May 2020 - May 2021
Worked with Prof Kannan Srinivasan, on developing a wireless system to estimate RF properties of food and classify them based on the nutrient composition by sensing the microwave leakage through the oven window. Patent is submitted. Research published in New Scientist magazine. Article link **Technologies:** *WARP, MATLAB, Python*

Full Duplex Relay Cluster
The Ohio State University December 2018 - Present
Working with Prof Kannan Srinivasan and Lu Chen on developing an end to end physical layer in-band full duplex system using full duplex relays and its application.
Technologies: *WARP, MATLAB, FPGA*

POWWOW osuwireless overlay with Edge Computing and Core Computing support
The Ohio State University On-going
Working with Prof Kannan Srinivasan, Prof Anish Arora and Prof Rajiv Rammnath on developing an end-to-end system extending osuwireless to allow IoT devices to WiFi/BLE/USB connect to access points across campus.
Technologies: *USRP, MATLAB, Elastic Search, Grafana, Docker*

Portable D2D Networks for Emergency Community Messaging
The Ohio State University May 2018 - July 2019
Worked with Prof Kannan Srinivasan and Rupen Mitra to create **PODNETS**, an application layer protocol that brings unconnected communities back on to an off-grid network that enables them to communicate using smartphones. Publication is submitted.
Technologies: *Android SDK, Java,MATLAB*

Optimal Scheduling of Distributed Energy Resources in Energy Market
Jadavpur University Mar 2015 - May 2017
Worked with Prof Ujjwal Maulik aand developed a model for optimal scheduling of DERs and proposed its application in energy market. Publication accepted in IEEE

Indicon 2015
Technologies:*Python, MATLAB*

PROJECTS

Wireless Communication

Smart Grid IoT: Developed a simulation model to support the Smart Grid communication using IOT devices.(LORA and zigbee). We optimized cell designs and maximum capacity to improve our system. **Technologies**: NS3, Python, Matlab

HTAP in IoT test-bed: Hybrid transaction/analytical processing (HTAP) integration into campuswide wireless IoT test bed. Develop a use-case to count number of people inside a room using wireless sniffing **Technologies**: USRP, Grafana, Elastic Search, Docker, MySQL

Machine Learning

LSTM Texter : Developed a LSTM based poetry and quotes generator based on character and word. **Technologies**: Python, Keras.

English Premier League Manager : Machine Learning based team selection for English premier league teams. Developed features based on individual players. Predicted the score of the match based on previous knowledge **Technologies**: Python, Keras.

Software Development

Capstone Project with Affordable (Startup) : Developed the login functionality of Affordable (front and backend)Application. **Technologies:** C++,REACT,JavaScript, HTML/CSS

Designed a LISP Interpreter : **Technologies**: C++.

RELEVANT COURSES

Graduate
Computer Networking and Internet Technologies
Digital Signal Processing
Wireless Sensor Networks, Iot and MANET
Computer Architecture
Speech and Lang Processing
Machine Learning
Programming Language
Under Graduate
Wireless Communication
Microprocessor
Electronic Design Automation