ARGHA SEN

(+91) 7001927155 ⋄ arghasen10@gmail.com

Website: https://arghasen10.github.io/
Github: https://github.com/arghasen10/
Google Scholar: https://scholar.google.com/citations?user=QF2toEoAAAAJ&hl=en
LinkedIn: https://www.linkedin.com/in/arghasen10/

RESEARCH EXPERIENCE

- **Experience with mmWave and acoustic FMCW signal processing techniques. I have used mmWave and accoustic FMCW sensors for localization, tracking and activity recognition of humans under indoor environments.**
- **Hands-on experience in hardware prototyping including circuit design, circuit debugging, deployment. Developed prototype hardwares for Embedded Pollution Sensors mounted on a drone for air quality assesment.**
- **Experience conducting human research studies. Conducted real-time driver inattenviness study using COTS mmWave Radars by collecting doppler shifts in the mmWave data because of drivers attentive body movements, such as talking, yawning, nodding, etc.**
- **Experience with design of UAVs, control systems, RF communication devices. Developed drones using ArduCopter APM flight controller board and mounted air quality measurement sensors.**
- **Experience with Computer Networks, IoT devices, Distributed Sensor Networks. Worked on energy optimisation in 5G Cellular Networks, using network simulator ns-3.**

EDUCATION

Indian Institute of Technology Kharagpur *Jan 2021 - present*
Doctor of Philosophy
Department of Computer Science and Engineering

National Institute of Technology Durgapur *August 2016 - June 2020*
Bachelor of Technology **CGPA: 8.97**
Department of Electronics and Communication Engineering

Higher Secondary School *2016*
Central Board Of Higher Secondary Education (CBHSE) **Aggregate Percentage: 95.4**
Jawahar Navodaya Vidyalaya, Birbhum

Secondary School *2014*
Central Board Of Secondary Education (CBSE) **Cum. GPA: 9.8**
Jawahar Navodaya Vidyalaya, Birbhum

PATENTS

1. **Argha Sen, Anirban Das, Sandip Chakraborty "A system for in-vehicle passive monitoring of driver behaviors.". India Patent Application: TEMP/E-1/18612/2024-KOL, filed 2nd February 2024.**

PUBLICATIONS

Peer-Reviewed Journals

1. **Argha Sen, Nuwan Bandara, Ila Gokarn, Thivya Kandappu, Archan Misra. "EyeTrAES: Fine-grained, Low-Latency Eye Tracking via Adaptive Event Slicing". ACM IMWUT 2024.**
2. **Argha Sen, Avijit Mandal, Prasenjit Karmakar, Anirban Das, Sandip Chakraborty "Passive Monitoring of Dangerous Driving Behaviors Using mmWave Radar". Pervasive and Mobile Computing Journal (PMC).**
3. **Basabdatta Palit, Argha Sen, Abhijit Mondal, Ayan Zunaid, Jay Jayatheerthan, Sandip Chakraborty "Improving UE Energy Efficiency through Network-aware Video Streaming over 5G". IEEE Transactions on Network and Service Management (TNSM) 2023.**
4. **Praveen Kumar Sharma, Bidyut Dalal, Ananya Mondal, Argha Sen, Amartya Banerjee, Sandip Mondal, Tanmay De, Sujoy Saha "Indoor Air Sensing: A Study in Cost, Energy, Reliability and Fidelity in Sensing". Sensing and Imaging Journal, Springer 2023.**

Conferences (Main Track)

1. **Argha Sen, Soham Chakraborty, Soham Tripathy, Sandip Chakraborty. "RadarTrack: Enhancing Ego-Vehicle Speed Estimation with Single-chip mmWave Radar". IEEE SmartComp 2025.**
2. **Rajib Sarkar, Argha Sen, Sandip Chakraborty. "CarVision: Vehicle Ranging and Tracking Using mmWave Radar for Enhanced Driver Safety". IEEE PerCom 2025.**
3. **Argha Sen, Bhupendra Pal, Seemanth Achari. "SmartMME: Implementation of Base Station Switching Off Strategy in ns-3r". IEEE ANTS 2024.**
4. **Nuwan Bandara, Thivya Kandappu, Argha Sen, Ila Gokarn, Archan Misra. "EyeGraph: Modularity-aware Spatio Temporal Graph Clustering for Continuous Event-based Eye Tracking". NeurIPS Datasets and Benchmarks Track 2024.**
5. **Argha Sen, Anirban Das, Swadhin Pradhan, Sandip Chakraborty "Continuous Multi-user Activity Tracking via Room-Scale mmWave Sensing". ACM/IEEE IPSN 2024.**
6. **Argha Sen, Avijit Mandal, Prasenjit Karmakar, Anirban Das, Sandip Chakraborty "mmdrive: mmWave Sensing for Live Monitoring and On-Device Inference of Dangerous Driving". IEEE PerCom 2023.**
7. **Argha Sen, Anirban Das, Prasenjit Karmakar, Sandip Chakraborty "mmAssist: Passive Monitoring of Driver's Attentiveness Using mmWave Sensors". IEEE COMSNETS 2023.**
8. **Argha Sen, Ayan Zunaid, Soumyajit Chatterjee, Basabdatta Palit, Sandip Chakraborty "Revisiting Cellular Throughput Prediction: Learning *in-situ* for Multi-device and Multi-network Considerations for 5G". EWSN 2023.**

Conferences (Posters/Workshops/Demos)

1. **Argha Sen, Soham Chakraborty, Soham Tripathy, Sandip Chakraborty. "Beyond Doppler: Demonstrating Phase-Based Ego-Speed Estimation on Embedded mmWave Radar". IEEE SmartComp Demos 2025.**
2. **Rajib Sarkar, Argha Sen, Sandip Chakraborty. "mmTraffic : Live In-car Traffic Monitoring using mmWave Sensing". IEEE PerCom WIP 2025.**
3. **Deepraj Das, Soumik Mandal, Ashutosh Golande, Argha Sen, Sandip Chakraborty. "mmWave Based User Identification using Gait Signatures". COMSNETS Posters 2025.**
4. **Argha Sen, Amrta Chaurasia, Avijit Mandal, Sandip Chakraborty. "Capturing Human Emotion Pervasively using COTS mmWave Radar". ACM COMPASS Posters 2024.**
5. **Argha Sen, Soham Chakraborty, Soham Tripathy, Sandip Chakraborty "Poster: Dynamic Ego-Velocity estimation Using Moving mmWave Radar: A Phase-Based Approach". ACM MobiSys Posters 2024.**

6. **Argha Sen, Anirban Das, Swadhin Pradhan, Sandip Chakraborty "Demo Abstract: *MARS* -An mmWave-based Multi-user Activity Tracking Solution". ACM/IEEE IPSN Demos 2024.**
7. **Argha Sen, Sashank Bonda, Jay Jayatheerthan, Sandip Chakraborty "Implementation of mmWave-energy Module and Power Saving Schemes in ns-3". WNS3 2022.**
8. **Argha Sen, Sashank Bonda, Jay Jayatheerthan, Sandip Chakraborty"An ns3-based Energy Module for 5G mmWave Base Stations" IEEE INFOCOM Posters 2022.**
9. **Argha Sen, Abhijit Mondal, Basabdatta Palit, Jay Jayatheerthan, Krishna Paul, Sandip Chakraborty "An ns3-based Energy Module of 5G NR User Equipments for Millimeter Wave Networks" IEEE INFOCOM Posters 2021.**
10. **Praveen Kumar Sharma, Suraj Gupta, Argha Sen, Tanmoy De, Sujoy Saha "Exploring Collision Avoidance during Communication Over Sound for Healthy Environment" SoCIeTY, ICDCN Workshops 2020.**
11. **Argha Sen, Monsij Biswal, Shreyan Datta "Intelligent Traffic Routing Based on Real-time Congestion Analysis" IEEE INDICON 2019.**

WORK EXPERIENCE

Research Intern, Nokia bell Labs, Cambridge, UK **Jun 2025 - Aug 2025**

Working with the Device Forms team in the Pervasive Systems Department at Nokia Bell Labs in Cambridge, UK. The objective of the internship is to design an earable platform for Transient Evoked Otoacoustic Emissions (TEOAE) for hearing loss assessment.

DAAD-DST Research Exchange Programme **Dec 2024 - Jan 2025**

Visited the Computer Architecture research Group at the University of Bremen, Germany as part of an Indo-German DST-DAAD project titled "Synthesis and Verification Targeted to Memristive Crossbars" under Prof. Rolf Drechsler.

Visiting Postgraduate Research Student, SMU, Singapore **Aug 2023 - Feb 2024**

- **High-Frequency Temporal Eye Movement Features For Robust Biometric Authentication Using Event Cameras**
  Paper 1, Paper 2.

Junior Research Fellow (INTEL sponsored Project) **Oct 2020 - April 2023**

- **Traffic Engineering for Enabling Energy-aware Design in Next Generation Cellular Networks**
- **mmwave-energy module for ns-3 (Completed)**
  GitHub: `https://github.com/arghasen10/mmwave-energy`

Summer Research Intern **May 2019 - July 2019**
Integrated Test Range, Chandipur, DRDO, Govt. of India

- **3D Tracking and Geo-Localization of a target using Unmanned Aerial Vehicles**

Winter Research Intern **Nov 2018 - Jan 2019**
Mobile Computing & Network Research Group MCNRG, NIT Durgapur

- **AeT-Drone: Aerial Environment Sensing and Traffic Surveillance using sensor-enabled Drone/UAV**
  GitHub: `https://github.com/arghasen10/Image-Processing-in-UAV`
  Video: `https://www.youtube.com/watch?v=t7wGiFjItSI`

Summer Intern **May 2018 - July 2018**
Criotam Technologies PVT LTD, Bangalore

- **Designed and developed three IoT prototypes for Sports Authority of India. (Starting Block, Force Plate, Timing Gates)**
- **Developed a Facial Recognition system as a LockOut-Tagout (LOTO) system for Industrial IoT.**
  Video: `https://www.youtube.com/channel/UCEuhgjsfn7CaBQ2TpSGfjUw`

ACHIEVEMENTS

- **Recipient of COMSNETS Student Travel Grant for attending COMSNETS 2025**
- **Recipient of ACM COMPASS Travel Grant for attending ACM COMPASS 2024**
- **Recipient of ACM MobiSys Student Travel Grant for attending ACM MobiSys 2024**
- **Recipient of ACM IARCS Travel Grant for attending IPSN 2024**
- **Recipient of COMSNETS LRN Travel Grant for attending IEEE PerCom 2023**
- **Recipient of ACM IARCS Travel Grant for attending IEEE PerCom 2023**
- **Recipient of IEEE INFOCOM Travel Grant for attending IEEE INFOCOM 2021**
- **Received the Best Project Award at ITR Chandipur, DRDO, during the Summer Internship 2019 for the project titled "3D Tracking and Geolocalization of Targets Using Unmanned Aerial Vehicles".**
- **Participated in Festival of Innovation and Entrepreneurship (FINE) 2019 at NIF Gandhinagar, Gujarat from March 15 to 18, 2019.**
- **1st Position in Techmela, The annual science exhibition organized in AAROHAN 2019 for the project titled "AeT-Drone: Aerial Environment Sensing and Traffic Monitoring with UAV".**
- **1st position in the Onspot IoT Hackathon organized during AAROHAN 2019 among 70 entries. Presented a working prototype of an intrusion detection system using a Raspberry Pi Zero.**
- **1st position in Hackoverflow, the IoT Hackathon organized during AAVISHKAR 2018, the Techno-Management fest of NIT Durgapur.**
- **District Topper in Central Board of Higher Secondary Examination (CBHSE).**
- **Secured $15,883$ Rank in JEE Main 2016, out of $12,07,058$ applicants all over India.**

TECHNICAL SKILLS

Strongest Areas - Sensors, mmWave Sensing, FMCW Radars, Signal Processing, Deep Learning, Machine Learning, Embedded Systems, Internet Of Things, Computer networks, Unmanned Aerial Vehicles, Raspberry Pi, Arduino, UDOO Neo

Languages - Python, C, C++, RUST, UNIX Shell, JavaScript, Java, HTML, Android.

Tools and Frameworks - Tensorflow, PyTorch, MmWave Studio, Matlab, Git, Android Studio, ns-3, Mininet.

POSITION OF RESPONSIBILITY

Teaching Assistant; Computer Networks - Jan 2023-April 2023 ***IIT Kharagpur***

Teaching Assistant; Advances in Operating Systems - July 2022-Nov 2022 ***IIT Kharagpur***

Teaching Assistant; Programming and Data Structures - Jan 2021-July 2022 ***IIT Kharagpur***

Vice Captain of Team Robocon, NIT Durgapur - Sep 2018-Mar 2019 ***NIT Durgapur***

STUDENT MENTORING

Name	Program	Semester	Institute	Project Title
Soham Chakraborty	MTP	2024-25	IIT Kharagpur	Leveraging mmWave Radar for Comprehensive Automotive Perception: Ego-Motion Estimation and Backward Field-of-View Expansion
Vatsal Adhiya	MTP	2024-25	IIT Kharagpur	Basics and Mathematical background of mmWave Sensing
Rajib Sarkar	MS	2023-25	IIT Kharagpur	CarVision: Vehicle Ranging and Tracking Using mmWave Radar for Enhanced Driver Safety
Tirthankar Halder	MS	2023-25	IIT Kharagpur	Localization, Mapping, and Tracking using UAV under GPS-denied Environment
Ankita Chakraborty	MTech	2024-25	NIT Rourkela	Evaluating Video Streaming Performance over ns-3: Energy and Signal Strength in NLOS Environments
Soham Chakraborty	BTP	2023-24	IIT Kharagpur	Phase-based ego-velocity estimating using mmWave radar
Soham Tripathy	BTP	2023-24	IIT Kharagpur	
Adithya Pandiri	BTP	2023-24	IIT Kharagpur	Hand Writing Recognition using mmWaves
Gaurav Patidar	BTP	2023-24	IIT Kharagpur	Software Implementation of mmWave Demo Application
Aritra Sen	BTP	2022-23	IIT Kharagpur	
B. Sai Vamshi	BTP	2022-23	IIT Kharagpur	Understanding performance of Video Streaming Emulation in 5G cellular Networks using NS-3
Tejashwi Raj	BTP	2022-23	IIT Kharagpur	Real time Driver monitoring using COTS mmWave RADAR
Seemant Achari	BTP	2022-23	IIT Kharagpur	SmartMME: A Module for Energy Efficient Next Generation Cellular Networks
Sandipan Bera	MTP	2022-23	IIT Kharagpur	Indoor Human Activity Recognition using mmWave Sensing
Bhupendra Pal	MTP	2022-23	IIT Kharagpur	Implementation of Energy Efficient Base Station Switching Off in next-generation BS using ns-3
Avijit Mandal	MTP	2022-23	IIT Kharagpur	Capturing Human Emotion Pervasively using COTS mmWave Radar
Amrta Chaurasia	BTP	2022-23	IIT Kharagpur	
Sashank Bonda	MTP	2021-22	IIT Kharagpur	Application aware power state switching for 5G mmWave gNodeBs

PERSONAL DETAILS

Date of Birth: 20th November, 1998
Gender: Male
Nationality: Indian
Permanent Address: Vill+P.O. Chatra, Rampurhat, Birbhum, West Bengal. PIN: 731238
Phone: (+91) 7001927155

REFERENCES

 # Dr. Sandip Chakraborty ***Associate Professor***
Department of Computer Science & Engineering
Indian Institute of Technology Kharagpur , West Bengal, India.
Institute Website: http://www.iitkgp.ac.in
E-mail: sandipc@cse.iitkgp.ac.in / sandipchkraborty@gmail.com
Ph: +91 (3222) 282898

Prof. Archan Misra *Professor, Vice Provost*
School of Computing and Information Systems
Simgapore Management University, Singapore
E-mail: archanm@smu.edu.sg
Ph: +65 6808 5202

Dr. Soumyajit Chatterjee *Research Scientist*
Nokia Bell Labs
Cambridge , United Kingdom.
E-mail: sjituit@gmail.com

Dr. Thivya Kandappu *Assistant Professor*
School of Computing and Information Systems
Simgapore Management University, Singapore
E-mail: thivyak@smu.edu.sg
Ph: +65 68085446

Manvendra Singh Chauhan *Scientist C*
Electro Optical Tracking System
Integrated Test Range (DRDO) , Chandipur, Odisha , India.
E-mail: manvendresc@gmail.com

Prof. Sujoy Saha *Assistant Professor*
Department of Computer Science & Engineering
National Institute of Technology Durgapur , West Bengal, India.
Institute Website: http://nitdgp.ac.in/
E-mail: sujoy.ju@gmail.com