ARGHA SEN

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Website: https://arghasen10.github.io/
Github: https://github.com/arghasen10/
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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". Accepted in IEEE PerCom WIP 2025.

3. Deepraj Das, Soumik Mandal, Ashutosh Golande, Argha Sen, Sandip Chakraborty. "mmWave Based User Identification using Gait Signatures". Accepted in COMSNETS Posters 2025.

4. Argha Sen, Amrta Chaurasia, Avijit Mandal, Sandip Chakraborty. "Capturing Human Emotion Pervasively using COTS mmWave Radar". Accepted in 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

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*

PERSONAL DETAILS

Date of Birth: 20th November, 1998
Gender: Male
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REFERENCES

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Integrated Test Range (DRDO) , Chandipur, Odisha , India.
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