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**". **Accepted in 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. Rajib Sarkar, **Argha Sen**, Sandip Chakraborty. "**CarVision: Vehicle Ranging and Tracking Using mmWave Radar for Enhanced Driver Safety**". **Accepted in IEEE PerCom 2025**.

2. **Argha Sen**, Bhupendra Pal, Seemanth Achari. "**SmartMME: Implementation of Base Station Switching Off Strategy in ns-3r**". **Accepted in IEEE ANTS 2024**.

3. Nuwan Bandara, Thivya Kandappu, **Argha Sen**, Ila Gokarn, Archan Misra. "**EyeGraph: Modularity-aware Spatio Temporal Graph Clustering for Continuous Event-based Eye Tracking**". **Accepted in NeurIPS Datasets and Benchmarks Track 2024**.

4. **Argha Sen**, Anirban Das, Swadhin Pradhan, Sandip Chakraborty "**Continuous Multi-user Activity Tracking via Room-Scale mmWave Sensing**". **ACM/IEEE IPSN 2024**.

5. **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**.

6. **Argha Sen**, Anirban Das, Prasenjit Karmakar, Sandip Chakraborty "**mmAssist: Passive Monitoring of Driver's Attentiveness Using mmWave Sensors**". **IEEE COMSNETS 2023**.

7. **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. Rajib Sarkar, **Argha Sen**, Sandip Chakraborty. "**mmTraffic : Live In-car Traffic Monitoring using mmWave Sensing**". **Accepted in IEEE PerCom WIP 2025**.

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

3. **Argha Sen**, Amrta Chaurasia, Avijit Mandal, Sandip Chakraborty. "**Capturing Human Emotion Pervasively using COTS mmWave Radar**". **Accepted in ACM COMPASS Posters 2024**.

4. **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**.

5. **Argha Sen**, Anirban Das, Swadhin Pradhan, Sandip Chakraborty "**Demo Abstract: *MARS* -An mmWave-based Multi-user Activity Tracking Solution**". **ACM/IEEE IPSN Demos 2024**.

6. **Argha Sen**, Sashank Bonda, Jay Jayatheerthan, Sandip Chakraborty "**Implementation of mmWave-energy Module and Power Saving Schemes in ns-3**". **WNS3 2022**.

7. **Argha Sen**, Sashank Bonda, Jay Jayatheerthan, Sandip Chakraborty "**An ns3-based Energy Module for 5G mmWave Base Stations**" **IEEE INFOCOM Posters 2022**.

8. **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**.

9. 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**.

10. **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*

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

PERSONAL DETAILS

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

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