

Debajyoti Halder

Portfolio: debajyotihalder.in

Github: github.com/RotonEvan

Email: dhalder@cs.stonybrook.edu

Mobile: +1 (934) 221-8538

EDUCATION

- **Stony Brook University** Stony Brook, NY, USA
August 2022 - On-going
 - *Ph.D. Student - Computer Science; GPA: 3.8 / 4.0*
 - *Courses: Distributed Systems (A), Grad. Operating Systems (A-), Grad. Machine Learning (A), Natural Language Processing (A-)*
- **Indian Institute of Technology (IIT) Bhilai** Raipur, India
July 2018 - May 2022
 - *Bachelor of Technology - Computer Science Engineering; GPA: 8.2 / 10.0*
 - *Courses: Computer System Design (A), Advanced Computer Networks (A-), Adversarial Machine Learning (A)*

HONORS AND AWARDS

- Alumni Association's Young Researcher Award at IIT Bhilai - June, 2022
- Research Fellowship Award from Arista Networks - June, 2021 – [Publication](#)
- Honorary Mention Award at IEEE ComSoc Student Competition - November, 2021 – [Preprint](#)

PUBLICATIONS

- **How Carbon Metrics Impact Device Selection**: CarbonMetrics 2025, **D. Halder**, D. Banerjee, A. Mani, A. Gandhi, and E. Zadok, [DOI](#)
- **Empirical Evaluation of ML Models for Per-Job Power Prediction**: HotCloudPerf 2024, **D. Halder**, M. Acharya, A. Malsane, A. Gandhi, and E. Zadok, [DOI](#)
- **RIDS : Real-time Intrusion Detection System for WPA3 enabled Enterprise Networks**: GLOBECOM 2022 - 2022 IEEE Global Communications Conference, R. Saini, **D. Halder**, and A. M. Baswade, [DOI](#)
- **fybrrLink: Efficient QoS-aware Routing in SDN enabled Future Satellite Networks**: IEEE Transactions on Network and Service Management - Special Issue on 'Smart Management of Softwarized Networks', P. Kumar, S. Bhushan, **D. Halder**, and A. M. Baswade, [DOI](#)
- **fybrrStream: A WebRTC based Efficient and Scalable P2P Live Streaming Platform**: 2021 International Conference on Computer Communications and Networks (ICCCN), **D. Halder**, P. Kumar, S. Bhushan and A. M. Baswade, [DOI](#)

SKILLS SUMMARY

- **NodeJS, Express, MongoDB**: 4+ years, 7-8 projects
- **C++**: 4+ years, Implemented **Raft** protocol, and fault-tolerant k-v store in Distributed System course at SBU
- **Python**: 4+ years, 3-4 projects
- **Java and Spring MVC**: 1.5 years, Internship project
- **Android**: 2 years, 3 projects
- **WebRTC, IPFS, WebTorrent**: 2+ years, 3-4 projects
- **Interests**: Sustainability, Reliability, Distributed Systems, Networks (P2P, ICN), IPFS

RESEARCH & WORK EXPERIENCE

- **Unified Framework for Per-job Carbon Attribution** Stony Brook University
July 2023 - On-going
 - **Supervisors**: Dr. Anshul Gandhi and Dr. Erez Zadok
 - **Holistic Framework**: Building a unified framework to attribute per-job carbon emissions across operational, embodied, idle, and reliability-induced sources. Focused on GPUs and heterogeneous server components.
 - **GPU Analysis**: Integrated GPU profiling (**nvidia-smi**, **Nsight Systems**) to track GPU workload characteristics and predict per-job GPU power and carbon impact.
 - **Operational Carbon**: Developed machine learning models to predict per-job operational energy usage across CPU, DRAM, Disk, and GPU with high accuracy.
 - **Embodied Carbon**: Modeled embodied emissions from hardware components and attributed them per job, accounting for device type, usage intensity, and amortized lifetimes.
 - **Reliability-aware Attribution**: Extended framework to include carbon costs of workload-induced reliability degradation (e.g., DRAM errors, SSD/HDD wear), mapping job profiles to lifetime reduction.
 - **Idle Power Attribution**: Designed methods to distribute server idle power fairly among jobs, ensuring complete per-job accounting of carbon impact.
 - **Outcomes**: This work led to *CarbonMetrics 2025* ([DOI](#)) and a follow-up manuscript (in preparation) on unified per-job carbon attribution across operational, embodied, and reliability dimensions.
- **Per-job Operational Power Estimation** Stony Brook University
August 2022 - June 2023
 - **Supervisors**: Dr. Anshul Gandhi and Dr. Erez Zadok
 - **Per-job Power Prediction**: Tracked per-job CPU, DRAM, and Disk usage using **perf stat** and **blktrace**; trained ML regressors to predict per-job *operational* power.

- **Model Evaluation:** Benchmarked linear and tree-based models; the final XGBoost model achieved ~7% MAPE across diverse workloads.
- **Tooling:** Built a lightweight monitoring pipeline to collect per-job resource counters and produce real-time per-job energy estimates.
- **Outcome:** *Empirical Evaluation of ML Models for Per-Job Power Prediction* (HotCloudPerf 2024) — [DOI](#).

• Research Fellowship from Arista Networks

• *Supervisor: Dr. Anand M. Baswade*

IIT Bhilai

Jun 2021 - Apr 2022

- **Real-time IDS for WPA3:** A two stage architecture for real-time intrusion detection for an enterprise scenario.
- **Attacks on WPA3 testbed:** A new, open source dataset for attacks on WPA3-enabled device.
- **ML based IDS:** A lightweight ML-based classifier for attack detection with high accuracy in real-time.
- **ACCEPTED at GlobeCom '22:** *RIDS : Real-time Intrusion Detection System for WPA3 enabled Enterprise Networks* - [DOI](#)

• Research on SDN in Satellite Networks

• *Supervisor: Dr. Anand M. Baswade*

IIT Bhilai

Jan 2021 - Jun 2022

- **QoS aware routing:** Developed an algorithm (linear time) better than Dijkstra to find the shortest as well as QoS aware route in a Satellite Network.
- **Protocols for flow rule transfer:** Developed protocols for flow rule transfer in SDN which ensure non-disruptive service during satellite handovers.
- **ACCEPTED in IEEE TNSM:** *fybrrLink: Efficient QoS-aware Routing in SDN enabled Future Satellite Networks* - [DOI](#)

• Intern at DMLab, Chile

• *Software Engineer Intern*

Remote

Sep 2020 - Apr 2022

- **Aeris:** Live peer-to-peer video calling based physiotherapy.
- **Computer Vision:** Pose estimation for diagnosis using Mediapipe (Tensorflow).
- **P2P platform:** Implemented fybrrChat - WebRTC based P2P video calling for the appointment system.
- **Website:** Visit [DMLab, Chile](#)

• Intern at Elogix Softwares Pvt. Ltd., Kolkata

• *Full Stack Development Intern*

Kolkata, India

May 2019 - Jul 2019

- **PLMS:** RFID based Plant Logistics Management System. Used Java and Spring framework for the development.
- **Tracking and analysis:** Real-time truck inventory issuing, anomaly/theft detection.
- **Data Analysis:** Generated custom Jasper reports for Data Analysis.
- **Website:** Visit [Elogix, Kolkata](#)

VOLUNTEER EXPERIENCE

• Student Lead at Google Developer Student Club - IIT Bhilai

• *Institute-wide hackathons, workshops, projects, open-source awareness*

IIT Bhilai

Aug 2020 - Jun 2021

• Club Co-ordinator of Swara - The Music Club - IIT Bhilai

• *College band lead, inter-college band performances*

IIT Bhilai

Apr 2019 - March 2020