Debajyoti Halder

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EDUCATION

Stony Brook University — Stony Brook, NY, USA
Ph.D. Student - Computer Science; GPA: 3.8 / 4.0 — *August 2022 - On-going*
Courses: *Distributed Systems (A), Grad. Operating Systems (A-), Grad. Machine Learning (A), Natural Language Processing (A-)*

Indian Institute of Technology (IIT) Bhilai — Raipur, India
Bachelor of Technology - Computer Science Engineering; GPA: 8.2 / 10.0 — *July 2018 - May 2022*
Courses: *Computer System Design (A), Advanced Computer Networks (A-), Adversarial Machine Learning (A)*

RESEARCH & WORK EXPERIENCE

Reliability of Server Components — Stony Brook University
Supervisors: Dr. Anshul Gandhi and Dr. Erez Zadok — *Jan 2024 - On-going*
- **Reliability**: Estimating reliability impact on server components due to workloads.
- **SSDs & HDDs**: Built regression models for predicting the Remaining Useful Lifetime (RUL) of SSD/HDDs from SMART values. Models can predict RUL with an MAE of ~13 days.
- **Per-job RUL impact**: Building a model to estimate SMART values based on job profile and component load, and further predict per-job RUL impact on the component.
- **DRAM**: Building a regression model to predict RUL of DRAM from DRAM error logs. Training on publicly available error logs datasets.
- **Novelty**: Prior works employ classification models to predict whether a component will fail within a certain window, we use regression models to predict per-job impact on the RUL of the component.

Per-job Operational and Embodied Carbon Emissions — Stony Brook University
Supervisors: Dr. Anshul Gandhi and Dr. Erez Zadok — *August 2022 - On-going*
- **Per-job Power Prediction**: Tracking per-job resource usage in servers using `perf-stat` and `blktrace`, and predicting power consumption of each workload using ML models.
- **Evaluating ML models**: Extensive evaluation of a wide variety of ML models with various power model formulations. The final XGBoost model could predict per-job operational power with ~7% MAPE.
- **Embodied carbon**: Built a model to predict embodied carbon emission from the server configurations.
- **Monitoring tool**: Developed a resource monitoring tool to analyze the usage of server components in real-time and report per-job embodied share per-unit time.
- **ACCEPTED in HotCloudPerf 2024**: Empirical Evaluation of ML Models for Per-Job Power Prediction - [DOI](DOI)

Research Fellowship from Arista Networks — IIT Bhilai
Supervisor: Dr. Anand M. Baswade — *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](DOI)

Research on SDN in Satellite Networks — IIT Bhilai
Supervisor: Dr. Anand M. Baswade — *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](DOI)

Intern at DMLab, Chile — Remote
Software Engineer Intern — *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 — Kolkata, India
Full Stack Development Intern — *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

Publications

- **Workshop Paper - Empirical Evaluation of ML Models for Per-Job Power Prediction**: HotCloudPerf 2024, **D. Halder**, M. Acharya, A. Malsane, A. Gandhi, and E. Zadok, [DOI](#)

- **Conference Paper - 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](#)

- **Journal Paper - 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](#)

- **Conference Paper - 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](#)

Honors and Awards

- Alumni Association's Young Researcher Award at IIT Bhilai - June, 2022
- Research Fellowship Award from Arista Networks - June, 2021
- Honorary Mention Award at IEEE ComSoc Student Competition - November, 2021

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
- **Extra**: Music & Digital Arts

Volunteer Experience

- **Student Lead at Google Developer Student Club - IIT Bhilai**   IIT Bhilai
  Institute-wide hackathons, workshops, projects, open-source awareness   *Aug 2020 - Jun 2021*

- **Club Co-ordinator of Swara - The Music Club - IIT Bhilai**   IIT Bhilai
  College band lead, inter-college band performances   *Apr 2019 - March 2020*