Baisakhi Chatterjee

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PhD Candidate with extensive research background in coordinated mission planning by autonomous aerial vehicles. Possesses strong technical aptitude, leadership experience and is skilled in building diverse applications. Excited about opportunities to innovate, collaborate and contribute to research-driven software systems.

EDUCATION

North Carolina State University, RALEIGH, NC — **Expected MAY 2026**
Doctor of Philosophy, *Computer Science* — **GPA**: 4.0/4.0

Institute of Engineering & Management (IEM), KOLKATA, INDIA — **JUL 2018**
Bachelor of Technology, *Computer Science & Engineering* — **GPA**: 9.15/10.0

SKILLS

RESEARCH EXPERIENCE Autonomous Systems, Unmanned Vehicles, Wireless Systems, Routing Protocols, Network and Communications
LANGUAGES Java, Python, C, C++, Javascript, SQL, NodeJS, Visual BASIC, R, Shell Script
TECHNOLOGY & FRAMEWORK Spring, Hadoop, Apache, Qiskit, Matplotlib, Numpy

EXPERIENCE

GRADUATE ASSISTANT, ***North Carolina State University***, RALEIGH, NC — **AUG 2021 – PRESENT**

- *Research Assistant*
  - Developed sample experiment for AERPAW (Aerial Experimentation and Research Platform for Advanced Wireless) in Python demonstrating coordination among multiple UAVs. Utilized ZMQ Broker for message exchange between nodes via Ground Coordinator which acted as a router.
  - Designed algorithm for Source Localization by a drone in flight, based on estimation of Signal Strength emitted by a Ground Rover hidden in a field.
- *Teaching Assistant*
  - Facilitated instructional sessions, performed diligent evaluation of student coursework to assess their progress and provide valuable feedback.
  - Conducted scheduled office hours for **over 50** students, providing them with personalized guidance and necessary feedback in order to aid their learning.

SOFTWARE ENGINEER, ***Nomura Research Institute, Financial Technology (NRIFT)***, KOLKATA, INDIA — **AUG 2018 – JUL 2021**

- Developed back-office solutions for financial firms across multiple Asian markets using Spring Framework in Java and OracleDB.
- Designed *Financial Settlement Module* that processed changes in user assets across multiple investments and generated reports estimating both current and projected value of client portfolio. Implemented novel UI based on user requirements and introduced *ephemeral save* functionality allowing users to temporarily save progress while maintaining integrity of data flow. Improved efficiency of new feature resulting in up to **7% faster loading times**.
- Built customizable *Authorization Framework* using Aspect Oriented Programming (AOP) in Spring allowing users to configure levels of verification needed across different modules and functions. Also designed *Access Control Framework* which allowed Admins to assign roles to users and restrict feature access.
- Implemented NodeJS based web-scraper which collected the price of airfare depending on trip parameters including single-hop and multi-hop flights. Used multi-threading techniques to **significantly improve performance (20%)** while collating data as compared to previous methods.
- Developed MySQL based solutions which replaced existing frameworks for client report generation and improved processing speed.
- Designed RESTful Onboarding System for faster registration of Customer and Account data of Client firms using message-based batch processing.
- Oversaw a team of developers, providing guidance and mentorship to newly hired software engineers, fostering a collaborative and results-driven culture.

RESEARCH SCHOLAR, ***Indian Statistical Institute***, KOLKATA, INDIA — **JUN – JUL 2017**

- Conducted research on the detection of large-scale communities in connected networks, thereby gaining insights into the logistics of pursuing research.
- Surveyed existing literature on characterization and categorization of social network concentrations as an example of online large-scale communities.
- Implemented introductory algorithms in CUDA, thus gaining an understanding of Parallel Programming using GPUs.

RESEARCH PUBLICATIONS

[2024] B Chatterjee, S Chaudhari, Z Li, Y Liu and R. Dutta. "**Wireless Signal Source Localization by Unmanned Aerial Vehicle using AERPAW Digital Twin and Testbed,**" 2024 IFIP Networking Conference (IFIP Networking), Thessaloniki, Greece, 2024.

[2024] B Chatterjee and R. Dutta. "**Guaranteeing Partial State Synchronization for UAV Platoon Under Message or UAV Loss,**" 2024 International Conference on Computing, Networking and Communications (ICNC), Big Island, HI, USA, 2024, pp. 215-220.

[2023] B Chatterjee and R. Dutta. "**Cooperative UAV Trajectory Planning for Plume Wrapping of a Spherical Dome,**" 2023 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Jaipur, India, 2023, pp. 264-269.

[2022] B Chatterjee and R. Dutta. "**Studying the Effect of Network Latency on an Adaptive Coordinated Path Planning Algorithm for UAV Platoons,**" Proceedings of the 2022 workshop on Eighth Workshop on Micro Aerial Vehicle Networks, Systems, and Applications. ACM, Jun. 25, 2022.

[2019] B Chatterjee and HN Saha. "**Parameter Training in MANET using Artificial Neural Network,"** International Journal of Computer Network and Information Security, vol. 11, no. 9. MECS Publisher, pp. 1–8, Sep. 08, 2019.

[2018] HN Saha, A Chatterjee and **B Chatterjee**. "**Acceptability Based Clustering Routing Protocol in MANET,**" 2018 IEEE 9th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), Vancouver, BC, Canada, 2018, pp. 1172-1180.

PROJECTS

QUANTUM ENTANGLEMENT SIMULATOR – Designed simulated Quantum Network that demonstrated entanglement of photons with **90% fidelity** for non-mixed pairs.
SECURE FILE TRANSFER SYSTEM – Implemented secure file transfer system, leveraging Diffie-Hellman protocol to encrypt data ensuring confidentiality.
ANALYZING ALGORITHMIC COMPLEXITY – Conducted comprehensive analysis of time complexities of various algorithmic sorting techniques across different data types.
LEGAL HELP WEB DEVELOPMENT – Developed website for legal help that enabled users to understand jargon, consult experts, and review past cases from public record.

LEADERSHIP & ENGAGEMENT

Vice President, *Computer Science Graduate Student Association* at NC STATE UNIVERSITY — AUG 2023 - Present
PhD Recruitment Volunteer, *Computer Science Department* at NC STATE UNIVERSITY — MAR 2023
Shining Star Award Winner for Project Contributions at NRIFT — SEP 2020
Entertainment Committee Member (Organizer and Emcee) for Cultural Events at NRIFT — OCT 2018 - JUL 2021
Director's Award for Student Contributions Winner at IEM — MAY 2018
Deputy Secretary General, *IEM Model United Nations at* IEM — SEP 2016