ARADHITA MUKHERJEE

Researcher, Academician

aradhita.mukherjee.2016@gmail.com 91-9477437924 Kolkata, India

RESEARCH PROJECTS

- **Security and Consistency in Cross-Chain Systems** Developed a cryptographic framework for cross-chain environments to address double-spending and eclipse-based double spending attacks while ensuring synchronized data across chains. The proposed model integrates modular arithmetic encryption and ECDSA for transaction integrity and employs a third party for auditing and cryptographic proof generation, enhancing scalability and security.
- **Consistency management in large-scale replicated databases** Developed a scalable, hierarchical transaction model for NoSQL databases that supports simultaneous modification of availability and consistency requirements which are otherwise restricted by CAP theorem. The proposed transaction model uses a Map/Reduce-based Apriori algorithm to map different data items to different consistency strategies and place correlated items on the same site in order to reduce latency.
- **Failure recovery in distributed social networks** Developed an unsupervised learning-guided failure recovery model for graph processing systems that can detect single and multi-node failures, and enables fast recovery. Proposed model provides improved performance as compared to state-of-the-art recovery models with respect to simultaneous recovery from single and multi-node failures, memory overload and computational latency.
- **Efficient data distribution strategy for distributed graph processing** Developed a genetic algorithm-based scalable data distribution method that supports quick placement of data partitions while increasing availability and task scheduling capabilities.
- **Storage and classification of real-time streaming data** Developed an architecture to store real-time streaming data using HBase cluster on top of HDFS, preserving both scalability and availability. The proposed architecture enables robust real-time classification using decision trees and Naive Bayesian classifiers.

TECHNICAL PROFICIENCY

- **Tools & Programming languages** Python (Spyder, Jupyter notebook, Google Colab), SQL, C, C++, Core Java, Hadoop, HBase
- **Libraries** Numpy, Pandas, Scikit-learn
- **Algorithms** Linear regression, k-NN, Logistic regression, Naive Bayesian, Decision tree; Clustering (k-means, k-mode, k-medoid, Hierarchical, Density-based), Genetic Algorithm, Association rule mining.

PROFESSIONAL APPOINTMENTS

Post-doctoral Researcher

Department of Environmental Sciences, Computer Science and Statistics, Ca' Foscari University of Venice

May 2024 – April 2025 Venice, Italy

Assistant Professor

Computer Science and Engineering,Meghnad Saha Institute of Technology

April 2021 – April 2024 Kolkata, India

PROFILE SUMMARY

An ardent researcher and a highly-motivated lecturer with 12+ years of experience in academia. Worked towards developing efficient data mining algorithms for enhanced performance in distributed systems. Conducted various courses and supervised student dissertations at undergraduate and postgraduate levels. Published 9 articles in peer-reviewed journals, conferences and book chapters.

ACHIEVEMENTS

- **2016** Awarded the prestigious Research Scholarship (Visvesvaraya Ph.D. Scheme) for Electronics amd IT, Ministry of Electronics and Information Technology, Government of India.
- **June, 2012** Qualified CBSE-UGC National Eligibility Test (NET-LS) (Computer Science and Applications).
- **2011** Ranked 4^{th} (1^{st} class) in M.Sc (CT), University of Burdwan.
- **2022** Acted as a reviewer in the The Journal of Supercomputing.
- **2024** Acted as a reviewer in the International Conference on Artificial Intelligence and Sustainable Computing (AISC 2024)
- **2024** Acted as a reviewer in the Smart Systems and Wireless Communication(SSWC 2024)
- **2024** Acted as a External reviewer in the International Symposium on Applied Computing for Software and Smart Systems (ACSS 2024)
- **2025** Acted as a reviewer in the International Conference on Artificial Intelligence and Sustainable Computing (AISC 2025)
- **2025** Acted as a reviewer in the International Symposium on Applied Computing for Software and Smart Systems (ACSS 2025)
- **2025** Acted as a reviewer in the International Conference on Security, Surveillance and Artificial Intelligence(ICSSAI 2025)

EDUCATION

Ph.D. (Tech.) (CSE)

University of Calcutta

Feb 2016 – April 2024 Kolkata, India

- **Thesis title**: Distributed File Systems: Management Techniques for Efficient Operations and Improved Performance.

Ph.D. Scholar (SRF)

Computer Science and Engineering , University of Calcutta

March'2018 –February'2021 Kolkata, India

Ph.D. Scholar (JRF)

Computer Science and Engineering , University of Calcutta

February'2016 – February'2018 Kolkata, India

Full-time Lecturer (On contract)

Department of Computer Science, Sarsuna College (UG and PG))

October'2014 to February 2016 Kolkata, India

Full-time Lecturer (On contract)

Department of Computer Science, Bethune College

Feb 2013 – Oct 2014 Kolkata, India

PUBLICATIONS (LATEST)

Journals

- **Mukherjee, A.**, Olivieri,L., Cortesi,A and Chaki, N. 2025. Double-Spending Attacks in Cross-Blockchain Ecosystems. Blockchain: Research and Applications. I.F. 6.9 (Under review)
- **Mukherjee, A.**, Chaki, R. and Chaki, N., 2023. An unsupervised learning-guided multi-node failure-recovery model for distributed graph processing systems. The Journal of Supercomputing, pp.1-26. I.F. 3.3
- **Mukherjee, A.**, Chaki, R. and Chaki, N., 2021. Data mining-based hierarchical transaction model for multi-level consistency management in large-scale replicated databases. Computer Standards & Interfaces, 74, p.103485. I.F. 4.1

Conference proceedings / Book chapters

- Olivieri,L., ,**Mukherjee, A.**, Chaki,N.,Cortesi,A.,2025,March.Cross-chain Smart Contracts and dApps Verification by Static Analysis: Limits and Challenges. In Joint National Conference on Cybersecurity ITASEC & SERICS February 3-8, 2025, Bologna.
- Olivieri,L., ,**Mukherjee, A.**, Chaki,N.,Cortesi,A.,2024,November.Blockchain Interoperability through Bridges: A Token Transfer Perspective. In Blockchain Computing and Applications : 6th International Conference, BCCA 2024, Dubai, United Arab Emirates, November 26–29, 2024,IEEE.
- **Mukherjee, A.**, Chaki, R. and Chaki, N., 2022, November. An Efficient Data Distribution Strategy for Distributed Graph Processing System. In Computer Information Systems and Industrial Management: 21st International Conference, CISIM 2022, Barranquilla, Colombia, July 15–17, 2022, Proceedings (pp. 360-373). Cham: Springer International Publishing.
- Roy, C., **Mukherjee, A.** and Chaki, N., 2022, September. Merkle DAG-based Distributed Data Model for Content-addressed Trust-less Verifiable Data. In 2022 7th International Conference on Computer Science and Engineering (UBMK) (pp. 462-467). IEEE.
- Roy, C., Chakraborty, D., Debnath, S., **Mukherjee, A.** and Chaki, N., 2021. Single failure recovery in distributed social network. In Recent Challenges in Intelligent Information and Database Systems: 13th Asian Conference, ACIIDS 2021, Phuket, Thailand, April 7–10, 2021, Proceedings 13 (pp. 203-215). Springer Singapore.
- **Mukherjee, A.**, Mondal, S., Chaki, N. and Khatua, S., 2019. Naive bayes and decision tree classifier for streaming data using hbase. Advanced Computing and Systems for Security: Volume Seven, pp.105-116.

Google Scholar: https://scholar.google.com/citations?user=TZ79PsAAAAAJ&hl=en

- **Supervisor**: Prof. Rituparna Chaki, Professor, A. K. Choudhury School of Information Technology, University of Calcutta
- **Joint Supervisor**: Prof. Nabendu Chaki, Professor, Department of Computer Science and Engineering, University of Calcutta
- **Current status**: Ph.D awarded on 3^{rd} April, 2024.

M.Tech (CSE)

University of Calcutta

2011-2013 Kolkata, India

M.Sc (CT)

University of Burdwan

2009-2011 Kolkata, India

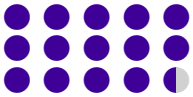
B.Sc. (Computer Science Honours)

Vivekananda College, University of Calcutta

2006-2009 Kolkata, India

LANGUAGES

English
Bengali
Hindi



PERSONAL DOSSIER

- **DOB** 15/02/1988
- **Marital status** Married
- **Nationality** Indian

REFEREES

Prof. Nabendu Chaki
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Department of Computer Science and Engineering,
University of Calcutta, Kolkata, India.
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nccomp@caluniv.ac.in

Prof. Rituparna Chaki
@ Professor
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University of Calcutta, Kolkata, India.
rituchaki@gmail.com