Dr. Riya Samanta

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Academic Background

- **Ph.D.**, Computer Science and Engineering, Indian Institute of Technology Kharagpur (2020–2025)
  - Title: *Skill-Oriented Task Assignment in Crowdsourcing: Efficiency, Stability, and Sustainability*
  - Supervisors: Prof. Soumya K. Ghosh (Professor, IIT Kharagpur, India) and Prof. Sajal K. Das (Professor, Missouri University of Science & Technology, Rolla, USA)
- **Postdoctoral Fellow**, Indian Institute of Technology Jodhpur (Feb 2025–May 2025)
- **M.Tech**, Computer Science and Engineering, University of Calcutta (2017–2019), CGPA: 9.6/10 (Gold Medalist)
- **B.Tech**, Computer Science and Engineering, University of Calcutta (2014–2017), CGPA: 8.5/10 (Silver Medalist)
- **B.Sc**, Computer Science Major, St. Xavier's College, University of Calcutta (2011–2014), CGPA: 7.56/10

Professional Experience

- **Assistant Professor**
  - Techno India University Kolkata, India (October 2025–Present)
  - Amity University Kolkata, India (June 2025–September 2025)
- **Postdoctoral Fellow**, Indian Institute of Technology Jodhpur (Feb 2025–May 2025)
  - Project: Seamless Man-Machine Interface for Next Generation Wargaming (DRDO)

Research Interests

- **Advancements in Crowdsourcing and Matching Algorithms [2019-present]:** My PhD research focuses on enhancing task assignment mechanisms in crowdsourcing platforms by developing innovative frameworks and algorithms. I have worked extensively on skill-oriented task allocation with adaptive time slots, designed bidirectional preference models for stable matching, and proposed strategies to ensure sustainable volunteer engagement and workforce composition balance. To address the scarcity of evaluation data, I introduced a Conditional Tabular GAN for generating realistic, contextually correlated synthetic datasets. By leveraging concepts from social computing, matching markets, and human computation, my work aims to improve the efficiency, fairness, and scalability of crowdsourcing systems. These contributions have practical applications in human resource management, freelancing platforms, and the gig economy, validated through rigorous theoretical analysis and experimental evaluations.
- **On-device Human Computer Interaction using TinyML [2021-present]:** In addition to my work on task assignment frameworks, I have been deeply involved in the domain of Edge AI and TinyML. My research includes implementing on-device machine learning in resource-constrained microcontroller unit (MCU) environments and developing on-device personalization techniques for human activity recognition in wearable devices. I have also created a system for human hand gesture recognition using wearable sensors for appliance control. Furthermore, I have extensive experience in developing on-device human-computer interaction (HCI) systems using TinyML, focusing on building resource-constrained, privacy-preserving solutions for applications such as human activity recognition, gesture recognition, and face tracking.

Publications

1. **R. Samanta**, S. K. Ghosh and S. K. Das, "Enhancing Crowdsourcing Through Skill and Willingness-Aligned Task Assignment with Workforce Composition Balance." Pervasive and Mobile Computing https://doi.org/10.1016/j.pmcj.2025.102012 [**Journal**]
2. **R. Samanta**, S. K. Ghosh and S. K. Das. "SoSTA: Skill-oriented Stable Task Assignment with Bidirectional Preferences in Crowdsourcing". IEEE Transactions on Emerging Topics in Computing DOI: 10.1109/TETC.2025.3548672 [**Journal**]
3. **R. Samanta** and S. K. Ghosh, "Sustainable Volunteer Engagement: Ensuring Potential Retention and Skill Diversity Workforce Composition in Crowdsourcing Paradigm." [DOI: https://doi.org/10.48550/arXiv.2408.11498 (arxiv)]
4. Riya Samanta et al. "Empowering Volunteer Crowdsourcing Services: A Serverless-assisted, Skill and Willingness Aware Task Assignment Approach for Amicable Volunteer Involvement" DOI: https://doi.org/10.48550/arXiv.2408.11510 [arxiv]
5. **R. Samanta**, B.Saha, S. K. Ghosh, and S.K.Das, 'CTG-KrEW: Generating Synthetic Structured Contextually Correlated Content by Conditional Tabular GAN with K-Means Clustering and Efficient Word Embedding" DOI: https://doi.org/10.48550/arXiv.2409.01628 [arXiv]
6. A. Raj, **R. Samanta**, B. Saha, and S. K. Ghosh, "Advancing Recommendations in Event-based Social Networks with Twin Tower Neural Networks and Embedding Techniques, " 2024 IEEE 21st India Council International Conference (INDICON), Kharagpur India, 2024.
7. **R. Samanta**, B. Saha, S. K. Ghosh, and R.B. Roy, "Eyes on You: TinyML-Powered On-Device FaceTracking for Low-Cost, Low-Power, Secure MCU Environments", Proceedings

of the 17th International Conference on COMmunication Systems & NETworkS (COMSNET), Bengaluru, India, 2025.

8. **R. Samanta**, B. Saha, and S. K. Ghosh, "A Low-Power Low-cost System for Disaster Locations Detection using ESP32 CAM and TinyML", Proceedings of the 17th International Conference on COMmunication Systems & NETworkS (COMSNET), Bengaluru, India, 2025.

9. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy, "Efficiency Redefined: Impact of Reducing Data Acquisition Rate for Optimized TinyML in Resource-Constrained IoT Devices", Proceedings of the 17th International Conference on COMmunication Systems & NETworkS (COMSNET), Bengaluru, India, 2025.

10. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy, "GenCPruneX: Adaptive Channel-wise Pruning for Efficient TinyML Deployment with Genetic Multi-Objective Optimization", Proceedings of the 17th International Conference on COMmunication Systems & NETworkS (COMSNET), Bengaluru, India, 2025.

11. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy. "TinyML-Powered Gesture Wizardry: Low-Cost, Low-Power Two-Stage CNN for Static Hand Gesture Classification on MCU in Appliance Control", Proceedings of the Fourth International Conference on AI-ML Systems (AIML Systems), Louisiana, USA, 2024.

12. **R. Samanta**, B.Saha and S. K. Ghosh, "LeafSense: A Portable, Low-Cost, Low-Power Plant Disease Diagnostic Device Using TinyML" Proceedings of the International Conference on AI-ML Systems (AIML Systems) Louisiana, USA, 2024.

13. **R. Samanta**, B.Saha and S. K. Ghosh. "TinyML-On-The-Fly: Real-Time Low-Power and Low-Cost MCU-Embedded On-Device Computer Vision for Aerial Image Classification" IEEE Space, Aerospace and defenCE conference (SPACE), Bengaluru, India, 2024.

14. B. Saha, **R. Samanta**, R.B Roy, C. Chakraborty, and S. K Ghosh. "Personalized Human Activity Recognition: Real-time On-device Training and Inference." IEEE Consumer Electronics Magazine (2024) [**Journal**]

15. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy. "From Wrist to World: Harnessing Wearable IMU Sensors and TinyML to Enable Smart Environment Interactions." Proceedings of the Third International Conference on AI-ML Systems(AIML Systems).Bengaluru, India, 2023. [**Best Demo Award**].

16. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy. "TinyML-Driven On-Device Personalized Human Activity Recognition and Auto-Deployment to Smart Bands." Proceedings of the Third International Conference on AI-ML Systems (AIML Systems), Bengaluru, India, 2023. [**Best Paper Award**].

17. B. Saha, **R. Samanta**, S. K. Ghosh, and R.B Roy. "BandX: An Intelligent IoT-band for Human Activity Recognition based on TinyML." Proceedings of the 24th International Conference on Distributed Computing and Networking (ICDCN). 2023.

18. B. Sethi, **R. Samanta**, et al. "Scalable Skill-oriented Task Allocation in Crowdsourcing within a Serverless Ecosystem." Proceedings of the 24th International Conference on Distributed Computing and Networking (ICDCN). 2023.

19. **R. Samanta**, V. Saxena, S. K. Ghosh and S. K. Das, "Volunteer Selection in Collaborative Crowdsourcing with Adaptive Common Working Time Slots," 2022 IEEE Global Communications Conference (GLOBECOM), Rio de 3 Janeiro, Brazil, 2022.

20. **R. Samanta** and S. K. Ghosh. "FogiRecruiter: A fog-enabled selection mechanism of crowdsourcing for disaster management." Concurrency and Computation: Practice and Experience 34.23 (2022): e7207. [**Journal**]
21. **R. Samanta**, S. K. Ghosh, and S. K. Das. "Swill-tac: skill-oriented dynamic task allocation with willingness for complex job in crowdsourcing." 2021 IEEE Global Communications Conference (GLOBECOM). Madrid, Spain, 2021.
22. R. Samanta, et al. "Node localization for indoor tracking using artificial neural network." 2018 Third International Conference on Fog and Mobile Edge Computing (FMEC). IEEE, 2018

Tools, Patents, and Datasets

1. **KrEW**: Tool for Skill-oriented Tabular Data Generation with CTGAN and Word Embedding
2. **Patent**: A Wearable Gesture Recognition System for Appliance Control published as Indian Patent, May 2024, Application No: 202431037176)
3. **Dataset**: R. Samanta and B. Saha, "SoloFace: A Single-Face Dataset for Resource-Constrained Face Detection and Tracking." Zenodo, Dec. 14, 2024. DOI: 10.5281/zenodo.14474899.

Teaching Experience

- Assistant Professor: Teaching undergraduate core subjects at Amity University
- Assistant Professor: Teaching undergraduate core subjects at Amity University
- Teaching Assistant, IIT Kharagpur: DBMS, OS
- NPTEL Courses: Cloud Computing, Computer Networks

Presentations

- ACM COMSNET 2025
- ACM AIML SYSTEM CONFERENCE 2024
- IEEE SPACE 2024
- IEEE COMPASS 2024
- ACM AIML SYSTEM CONFERENCE 2023
- ACM ICDCN 2023
- IEEE GLOBECOM 2022
- IEEE GLOBECOM 2021

Honors and Awards

- PhD thesis selected for oral presentation at Early Career Highlights – Young Researcher Spotlight (ECH YRS) track of ACM CODS-COMAD 2025

- Top 5 nominated for Aruna & Ram Gopal Khandelia Award (2023) for the project "Posture-Gaurd" and granted the product development support fund
- Best Paper Award, 3rd International Conference on AI-ML Systems, 2023
- Best Demo Paper Award, 3rd International Conference on AI-ML Systems, 2023
- Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF), IIT Kharagpur
- DST Inspire Fellowship, 2020
- UGC NET JRF, 2018 (99.88 Percentile)
- First Position in M.Tech, Gold Medalist
- Second Position in B.Tech, Silver Medalist
- 2nd Runners-up, ACM B.Tech Project Contest, 2017

Riya Samanta
Dated: January 7, 2026