

Resume

Riya Samanta

Post-doctoral Fellow

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Academic Background

- **Ph.D. in Computer Science and Engineering (UGC Fellow)**
Indian Institute of Technology Kharagpur, India (Jan 2020 - 2025) (Thesis Submitted)
Title “Skill-Oriented Task Assignment in Crowdsourcing: Efficiency, Stability, and Sustainability,”

Supervisors: Prof. Soumya Kanti Ghosh (IIT Kharagpur, India) and
Prof. Sajal K. Das (Missouri University of Science and Technology, USA)
- **Master of Technology in Computer Science and Engineering**
University of Calcutta, Kolkata, India (July 2017 - July 2019) - CGPA: 9.6/10
First Position (Gold Medalist)
- **Bachelor of Technology in Computer Science and Engineering**
University of Calcutta, Kolkata, India (July 2014 - June 2017) - CGPA: 8.5/10
Second Position (Silver Medalist)
- **Bachelor in Science (Computer Science Major)**
St. Xavier's College, University of Calcutta, Kolkata, India (July 2011 - June 2014)- CGPA: 7.56/10

Professional Experience

- **Postdoctoral Research Fellow (Ad-Hoc)**
Indian Institute of Technology Jodhpur (February 2025 - Present)
Project: “Seamless Man-Machine Interface for Next Generation Wargaming”
Sponsor: DRDO

Supervisor: Prof. Suchetana Chakraborty
Working on developing advanced human-machine interfaces for military wargaming applications.

Research Experiences

- **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.

- **Research Reviewer:**

I have contributed significantly to the scholarly community through my role as a peer reviewer for conferences like ACM ACSS, ICDCN, IEEE DABCON and journals like IEEE systems journal, IEEE transactions on mobile computing, IEEE transactions on Services Computing and Peer-to-Peer Networking and Applications.

Teaching Experience

- Teaching Assistant, IIT Kharagpur
 - Database Management Systems (DBMS)
 - Operating Systems (OS)
 - Geographic Information Systems (GIS)
- Additional Teaching for IIT Courses:
 - Cloud Computing (2022-2025) under Prof. Soumya K Ghosh
 - Computer Network and Internet Protocol under Prof. Soumya K Ghosh and Prof. Sandeep Chakraborty

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* DOI: <https://doi.org/10.1016/j.pmcj.2025.102012> [Journal]
2. **Riya Samanta** et al. "SoSTA: Skill-oriented Stable Task Assignment with Bidirectional Preferences in Crowdsourcing". *IEEE Transactions on Emerging Topics in Computing* DOI: [10.1109/TETC.2025.3548672](https://doi.org/10.1109/TETC.2025.3548672) [Journal]
3. **R. Samanta** and S. K. Ghosh, "Sustainable Volunteer Engagement: Ensuring Potential Retention and Skill Diversity for Balanced 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. Aditya Raj, **R. Samanta**, Bidyut 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, and S. K. Ghosh, “Eyes on You: TinyML-Powered OnDevice 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. Bidyut Saha, **Riya Samanta**, et al. “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. **Riya Samanta**, et al “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. **Riya Samanta** et al. “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. Bidyut Saha, **Riya Samanta**, et al. "Personalized Human Activity Recognition: Real-time On-device Training and Inference." IEEE Consumer Electronics Magazine (2024) [*Journal*]
15. Bidyut Saha, **Riya Samanta**, et al. "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. Bidyut Saha, **Riya Samanta**, et al. "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. Bidyut Saha, **Riya Samanta**, et al. "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. Biswajeet Sethi, **Riya 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 Janeiro, Brazil, 2022.
20. **Riya Samanta** and Soumya 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. **Riya Samanta**, Soumya K. Ghosh, and Sajal 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. **Riya 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.

Tool(s) and Patent(s)

- KrEW: Tool to Generate Synthetic Contextually Correlated Skill-oriented Tabular Content by CTGAN with Efficient Word Embedding and K-Means Clustering. Link: <https://riyasamanta.github.io/krew.html>
- A Wearable Gesture Recognition System for Appliance Control *Filed as **Indian Patent**, May 2024, Application No: 202431037176)*

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

Awards

- Top 5 nominated for Aruna & Ram Gopal Khandelia Award (2023) for the project "PostureGaurd" 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

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27/03/2025