Anirban Mukhopadhyay

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Areas of Interest and Expertise

- Developing AI agents to support transparency, control, and verifiability in information and creative work
- Studying team-AI collaboration in shared generative AI-powered workspaces
- Generating and evaluating design ideas based on crowdsourcing, sensemaking, and leadership frameworks

Education

Virginia Tech **Jan 2021 – May 2026 (Expected)**
PhD in Computer Science with a focus in Human-Computer Interaction (GPA: 4.0) *Blacksburg, Virginia*

Dissertation: Scaling Up OSINT Investigations through Training, Crowdsourcing, and Human-AI Collaboration

Jadavpur University **Aug 2014 – May 2018**
Bachelor of Engineering in Computer Science (GPA: 3.6) *Kolkata, India*

Work Experience

Microsoft **May 2023 – Aug 2023**
Design Research Intern in Mixed Reality Design and UX Research team *Redmond, Washington*

- Led a generative research study on understanding perceptions of trust in Copilot-driven AI experiences.
- Developed a scenario-based study design after a thorough literature review. This study focused on the effectiveness, preferred methods of interaction, and potential issues in 3 distinct scenarios faced by information workers depicted through storyboards, each varying in levels of importance and risk.
- Presented recommendations to partner teams for system relevance, transparency, human control, and data privacy based on findings from semi-structured interviews with 8 internal employees.

Microsoft **May 2022 – Aug 2022**
PhD Software Engineering Intern in Mixed Reality Design and UX Research team *Redmond, Washington*

- Improved 3D map interactions in Mixed Reality through a human-centered approach.
- Identified challenges, brainstormed ideas, prototyped and evaluated intuitive navigation interactions for Hololens 2 using Unity and MRTK.

Microsoft **Jun 2018 – Dec 2020**
Software Engineer (Full-stack) in SharePoint Taxonomy *Hyderabad, India*

- Instrumented and analyzed service telemetry and boosted reliability to 99.99%, ensuring robust user experiences.
- Developed REST API endpoints and integrated them to modernize the user interface for filtering SharePoint lists using React.
- Collaborated cross-functionally with design and PM teams and geographically distributed development teams.

Selected Research Projects

Enhancing Human-AI Co-Creativity by Supporting Leadership Behavior | *LLM Agents, Survey*

- Applied Research through Design method to develop a GPT-powered chatbot with Node.js to support 5 teams (21 participants) in designing high-quality educational Capture-the-Flag challenges (CTFs) for OSINT.
- Improved team-AI collaboration with agentic workflows that supported leadership behaviors like planning, clarifying goals, monitoring progress, and providing feedback. The system was deployed during Fall 2024.

Generative AI in Collaborative OSINT Investigations | *Co-design workshop, Focus Group, Survey*

- Led a co-design study to explore the role of LLMs in developing technical skills, supporting team collaboration, and augmenting real-world cybersecurity investigations.
- Conducted 10 two-hour-long design workshops with 6 undergraduates over a year to explore novel design ideas across the intelligence cycle. Applied matchmaking for generative AI to test its utility and challenges in a team of novices.
- Curated prompts and developed design implications for generative AI based on 3 successful real-world vulnerability assessments. Identified design goals for supporting leadership in these team-based investigations.

Flexible Crowdsourcing Framework for Complex Sensemaking Tasks | *Crowdsourcing, Interview, Thematic analysis*

- Applied Design-Based Research to aid 6 experts including journalists, fact-checkers, and law enforcement officers in leveraging crowdsourcing for discovery and verification of social media content.
- Collaborated with 30 undergraduates over a semester to refine task decomposition, ensure ethical and high-quality investigations, and improve expert-led synchronous collaboration.
- Conducted thematic analysis of 10 interviews, including 5 with experts and 5 student focus groups to demonstrate the system's effectiveness in scaling up complex sensemaking tasks.

Collaborative CTFs to Investigate Misinformation | *Web Development, Log analysis, Visualization*

- Developed a web app for 40 students using a Research through Design approach over a semester, blending collaboration and competition to debunk online misinformation.
- Designed surveys, conducted usability evaluations for design iteration and analyzed system logs to assess team strategies and evolving impact of rubric modifications.

Publications

Peer-reviewed Conference Papers

A. Mukhopadhyay, K. Luther. 2025. OSINT Clinic: Co-designing AI-Augmented Collaborative OSINT Investigations for Vulnerability Assessment In Proceedings of CHI Conference on Human Factors in Computing Systems (CHI '25), April 26-May 1, 2025, Yokohama, Japan. ACM, New York, NY, USA, 22 pages. **(CHI 2025)**

A. Mukhopadhyay, S. Venkatagiri, K. Luther. 2024. OSINT Research Studios: A Flexible Crowdsourcing Framework to Scale Up Open Source Intelligence Investigations. In Proceedings of the ACM on Human-Computer Interaction 8. CSCW1 (2024): 1-38. https://doi.org/10.1145/3637382 **(CSCW 2024)**

S. Venkatagiri, **A. Mukhopadhyay**, D. Hicks, A. Brantly, and K. Luther. 2023. CoSINT: Designing a Collaborative Capture the Flag Competition to Investigate Misinformation. In Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23). Association for Computing Machinery, New York, NY, USA, 2551–2572. https://doi.org/10.1145/3563657.3595997 **(DIS 2023)**

Selected Workshop Papers and Posters

A. Mukhopadhyay and K. Luther. Tailoring Generative AI to Augment Creative Leadership in Capture-The-Flag Development **(Submitted to CHI 2025 Workshop on Tools for Thought)**

A. Mukhopadhyay, K. Luther. Fostering **Collaboration and Creativity in Red Teaming** for OSINT Education. In Workshop on The Human Factor in AI Red Teaming: Perspectives from Social and Collaborative Computing. **(CSCW 2024)**

A. Mukhopadhyay, S. Venkatagiri, and K. Luther. Developing Collaboration and Competition Skills in a Crowd of Student OSINT Investigators. In Workshop on Supporting Workers in Developing Effective Collaboration Skills for Complex Work. **(CSCW 2023)**

A. Mukhopadhyay, S. Venkatagiri, and K. Luther. Towards Designing a Flexible Expert-led Crowdsourcing Framework for Investigating Misinformation. In Workshop on Designing Credibility Tools to Combat Mis/Disinformation: A Human-Centered Approach. **(CHI 2022)**

Research Skills and Methods

Design Methods: Co-design, Design-based Research, Research through Design, Scenario-based Design, Contextual Inquiry, Human-Centered Design

Tools and Libraries: Figma, OpenAI Assistants API, LangChain, Tensorflow, pandas, scikit-learn, Unity

Web Development: Django, Flask, Python, C#, Node.js, React, Java Script, HTML

Design Process: Personas, Journey Mapping, Wire-framing, Rapid Prototyping, Crowdsourcing, Experiment Design, Survey Design, User Interviews, Qualitative Data Analysis, Log Analysis (Telemetry), Usability Evaluations

Relevant Coursework

HCI: Human-AI Interaction (Explainable AI focus), CSCW & Social Computing, Information Visualization, Usability Engineering, Statistics in Research
Data Science and AI: Human-AI Interaction (Deep Learning focus), Deep Learning, Data Analytics