

CHANDRIKA MUKHERJEE

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EDUCATION

2022 - PRESENT	Ph.D. in Computer Science 3.83/4.00 Thesis: Enabling Secure User Interaction in Extended Reality Advisor: Prof. Z. Berkay Celik Purdue University	West Lafayette, IN, USA
2021 - 2023	M.S. in Computer Science 3.83/4.00 Purdue University	West Lafayette, IN, USA
2015 - 2019	B.Tech. in Computer Science and Engineering First Class with Distinction, 9.16/10.00 National Institute of Technology Durgapur	Durgapur, India

RESEARCH INTERESTS

My research interests broadly lie in the area of **systems security and privacy**. Through **system design, formal methods, machine learning**, and **user studies**, my research secures emerging computing systems that perceive the physical world through sensor input and use artificial intelligence to reason about it and act on behalf of their users. I uncover how these systems reveal users' sensitive information or act against user intent, and I build practical defenses for commodity devices. My research approach is best illustrated by my work in extended reality, and my future research extends it to other wearables and robots.

ACADEMIC AND RESEARCH APPOINTMENTS

2026 - PRESENT	Lead Graduate Student Prof. Celik's Research Group, Purdue University • Mentor undergraduate and graduate students through weekly one-on-one meetings • Guide Ph.D. students on research ideas, paper writing, and presentations
2022 - PRESENT	Graduate Research Assistant Purdue University • Characterize UI attacks that cause unintended user interactions in immersive systems • Detect such interactions at runtime using temporal logic specifications • Conduct mixed-method user and developer studies of security and privacy perceptions in emerging mobile systems • Analyze sensor and rendering side channels that leak user activity in AR/VR • Design gesture-based group pairing for MR headsets using eye and hand tracking
MAY - JUL 2018	Research Intern IIT Kharagpur, India • Designed a peer-to-peer video streaming tool supporting adaptive bitrate streaming while reducing server load
2017 - 2019	Research Assistant NIT Durgapur, India • Designed and field-tested an offline crisis mapping system using crowdsourced GIS over a hybrid ad hoc network

INDUSTRIAL EXPERIENCE

- MAY - AUG 2026 **Systems and Infrastructure SWE PhD Intern**
Meta, Menlo Park, CA - Similarity Understanding team, hosted by Jonathan Pinto
- Built per-model CPU, RAM, and GPU isolation for production machine learning models that assess the originality of content posted on Facebook
- MAY - AUG 2025 **Systems and Infrastructure SWE PhD Intern**
Meta, Seattle, WA - Data Flows (Privacy), hosted by Justin Liu
- Shipped an AI agent that helps privacy reviewers understand why sensitive data flows across Meta's systems by locating where data is declassified in code
- MAY - AUG 2022 **Software Engineering Intern**
Meta, New York, NY - Messenger Privacy, hosted by Ambareesha Raghothaman
- Developed UI tools that detect sensitive database access in code and visualize data flows across Meta's privacy assets, helping team leads vet Messenger features before release
- 2019 - 2021 **Software Engineer**
HSBC, Pune, India - Global Credit Module, Wealth and Personal Banking
- Developed full-stack features for a credit product used daily by relationship managers in HSBC's wealth banking

AWARDS AND HONORS

- **Andreas Pfitzmann Best Student Paper Award**, PETS (2026)
- **Best Presented Best Student Paper Award**, PETS (2026)
- ACM CCS Student Travel Grant (2026)
- **Honorable Mention Award (Top 6%)**, USENIX Security Symposium (2025)
- **Faculty Choice Best Poster Award**, Midwest Security Workshop (2025)
- Meta Bug Bounty Award, for collaborative work on "GPU-based Side-Channel Vulnerabilities in XR" (2025)
- USENIX Security Symposium Student Travel Grant (2025)
- ACM SIGBED Student Travel Grant, CPS-IoT Week (2025)
- Purdue Women in Science Program (WISP) Travel Grant (2025)

PUBLICATIONS

Peer-reviewed conference publications:

- C6 **Chandrika Mukherjee**, Aishwarya Devi Akila Pandian, Arjun Arunasalam, Jiasi Chen, Z. Berkay Celik, Habiba Farrukh. *EXRPOSE: Runtime UI-based Attack Detection in WebXR*. ACM SIGSAC Conference on Computer and Communications Security (CCS), 2026 (to appear).
- C5 **Chandrika Mukherjee**. *Characterizing and Enforcing Interaction Integrity on the Immersive Web*. ACM SIGSAC Conference on Computer and Communications Security (CCS), Doctoral Symposium, 2026 (to appear).
- C4 Joshua Shinkle, **Chandrika Mukherjee**, Abdullah Imran, Arjun Arunasalam, Donna Artusy, Antonio Bianchi, Z. Berkay Celik, Alexander Master. *No Privacy for Privates: How Military Communities Experience and Perceive the Privacy Risks of Military-Marketed Mobile Apps*. Proceedings on Privacy Enhancing Technologies (PoPETs), 2026. (Acceptance Rate: 22.4%). **Andreas Pfitzmann Best Student Paper Award. Best Presented Best Student Paper Award. Featured in WIRED.**
- C3 Seonghun Son, **Chandrika Mukherjee**, Reham Mohamed, Berk Gulmezoglu, Z. Berkay Celik. *Side-channel Inference of User Activities in AR/VR Using GPU Profiling*. Network and Distributed System Security Symposium (NDSS), 2026. (Acceptance Rate: 17.9%).
- C2 **Chandrika Mukherjee**, Reham Mohamed, Arjun Arunasalam, Habiba Farrukh, Z. Berkay Celik. *Demo: UI Based Attacks in WebXR*. ACM International Conference on Mobile Systems, Applications, and Services (MobiSys), 2025.

- C1 **Chandrika Mukherjee**, Reham Mohamed, Arjun Arunasalam, Habiba Farrukh, Z. Berkay Celik. *Shadowed Realities: An Investigation of UI Attacks in WebXR*. USENIX Security Symposium, 2025. (Acceptance Rate: 17.1%). **Honorable Mention Award**.

Peer-reviewed workshop publications:

- W2 **Chandrika Mukherjee**, Arjun Arunasalam, Habiba Farrukh, Reham Mohamed, Z. Berkay Celik. *Towards Secure User Interaction in WebXR*. International Workshop on Human-Centered Sensing, Modeling, and Intelligent Systems (HumanSys), ACM SenSys, 2025.
- W1 Partha Sarathi Paul, **Chandrika Mukherjee**, Bishakh Chandra Ghosh, Sudipta Pandit, Sujoy Saha, Subrata Nandi. *On designing a fast-deployable ‘localized’ GIS platform for using ‘offline’ during post-disaster situation*. Workshop on Emergency Response Technologies and Services (EmeRTeS), International Conference on Distributed Computing and Networking (ICDCN), 2019.

Papers under review:

* denotes equal contribution

- R3 **Chandrika Mukherjee**, Aishwarya Devi Akila Pandian, Arjun Arunasalam, Jiasi Chen, Z. Berkay Celik, Habiba Farrukh. *From Design Choice to Security Risk: How Developers Reason About UI Properties that Enable Attacks in Immersive Web Environments*. 2026.
- R2 **Chandrika Mukherjee***, Reham Mohamed*, Habiba Farrukh, Abdullah Imran, Antonio Bianchi, Z. Berkay Celik. *STARETOPAIR: Gesture-based Group Pairing for Mixed Reality*. 2026.
- R1 Habiba Farrukh, Haozhe Zhou, **Chandrika Mukherjee**, Reham Mohamed, Eyup Emre Ulku, Z. Berkay Celik. *Systematic Analysis of Side-Channel Attacks through Mobile Sensors*. 2026.

TEACHING EXPERIENCE

Co-instructor:

- ENGR 133 - First Year Engineering, Purdue University (Summer 2023)
Programming with Python and MATLAB
Taught about 200 students (150 online, 50 in-person) and managed 4 undergraduate teaching assistants

Invited Guest Lecturer:

- CS 526 - Information Security (Graduate Course), Purdue University (Fall 2026)
Invited by Prof. Christina Garman to lecture on adversarial machine learning and AI agent security
- CS 361 - Great Issues in Computer Science, Purdue University (Spring 2025, Spring 2026)
Topic: Introduction to XR and Its Associated Security & Privacy Issues
- CS 197 - Freshman Honors Seminar (Honors Course), Purdue University (Spring 2026)
Topic: Introduction to XR and Its Associated Security & Privacy Issues

Teaching Assistant:

- CSCI 495 - Explorations in Applied Computing, Purdue University (Fall 2025)
Co-designed project-based deep learning assignments with the instructor and guided student projects
- CS 182 - Foundations of Computer Science, Purdue University (Fall 2024)
Led weekly problem-solving sessions on discrete mathematics and algorithmic complexity
- EPICS/VIP - Engineering Projects in Community Service and Vertically Integrated Projects, Purdue University (Fall 2022, Spring 2023, Fall 2023)
Mentored first-year to senior student teams on community-partnered projects and led technical workshops

PRESENTATIONS

Invited Talks:

- I1 Security and Privacy of User Interaction in Extended Reality. University of California, Irvine. Irvine, CA, USA, May 2025.

Conference and Workshop Talks:

- T2 Securing User Interaction and Protecting Privacy in Emerging Mobile Systems (lightning talk). Midwest Security Workshop (MSW). Madison, WI, USA, October 2026.
- T1 Shadowed Realities: An Investigation of UI Attacks in WebXR. USENIX Security Symposium. Seattle, WA, USA, August 2025.

Posters and Demonstrations:

- P4 EXRPOSE: Runtime UI-based Attack Detection in WebXR (poster). Midwest Security Workshop (MSW). Madison, WI, USA, October 2026.
- P3 Shadowed Realities: An Investigation of UI Attacks in WebXR (poster). Midwest Security Workshop. Bloomington, IN, USA, September 2025. **Faculty Choice Best Poster Award.**
- P2 Demo: UI Based Attacks in WebXR (poster and live demonstration). ACM International Conference on Mobile Systems, Applications, and Services (MobiSys). Anaheim, CA, USA, June 2025.
- P1 Towards Secure User Interaction in WebXR (poster). International Workshop on Human-Centered Sensing, Modeling, and Intelligent Systems (HumanSys), ACM SenSys. Irvine, CA, USA, May 2025.

STUDENT RESEARCH MENTORING

* CS: Computer Science

Lalitendra Roy Boyapati	B.S. CS, Purdue University	2026 - Present
Chan-Nhu Pham	B.S. CS, Purdue University	2025 - Present
Seohyun Kim	M.S. CS, Purdue University	2026 - Present
Aishwarya Devi Akila Pandian	M.S. CS, Purdue University → Ph.D. CS, Purdue University	2025 - Present
Lilianne Brush	B.S. CS, Purdue University → Horizon3.ai	2024 - 2025

SERVICES

External Reviewer

- 2026: IEEE Symposium on Security and Privacy (S&P)
- 2026: IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)
- 2025: USENIX Security Symposium

Volunteering

- 2025: Student Volunteer, USENIX Security Symposium
- 2025: Cyber-Physical Systems (CPS) Security Outreach Event, Purdue University
Led hands-on sessions for high school students to interact with VR applications using VR headsets