

Soumyajit Chakraborty

Curious researcher, hands-on developer, and interdisciplinary collaborator

Expertise in VR/AR, spatial perception, collaborative navigation, experimental design, and teleoperation

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Education

Ph.D. in Computer Science | Vanderbilt University | 2019 – 2026 (anticipated)

Advisor: Dr. Bobby Bodenheimer

Master's in Computer Science | University of Iowa | 2017 - 2019

Research advisor: Dr. Joseph K. Kearney

B.Tech. in Computer Science and Engineering | Narula Institute of Technology | 2012 - 2016

Research Experience

Graduate Research Assistant | Vanderbilt University | 2019 - Present

- Investigate how asymmetric information shapes leadership and spatial knowledge, and how locomotion methods affect collaborative spatial learning, wayfinding, and cognitive mapping.
- Compared omnidirectional treadmill locomotion with natural walking in experiments on distance estimation and path integration.
- Studied the effects of interpupillary distance mismatch on perceived distances in VR headsets.
- Rendered high-fidelity full-body avatars using real-time motion capture for VR experiments.
- Conducted mobile AR and HoloLens 2 studies of the effects of animated avatar cues on distance perception.
- Assisted another graduate student with HTC Vive Pro latency measurements.

Computer Vision and Remote-Control Intern | Nokia Bell Labs | Summer 2025

- Built a predictive teleoperation system in Unity and WebRTC using video prediction and frame-time forecasting to compensate for network delay and jitter.

Graduate Research Assistant | University of Iowa | 2017 – 2019

- Built real-time avatars with full-body and head-motion capture, remotely linking Iowa pedestrian simulators to the National Advanced Driving Simulator (NADS) and University of Wisconsin-Madison driving simulator to study road-crossing interactions and inform autonomous vehicle interaction design.

Undergraduate Research Assistant | Narula Institute of Technology | 2015 - 2016

- Designed a web-based biometric voting system using Aadhaar credentials and fingerprint authentication.

Honors and Awards

Best Paper Honorable Mention | IEEE VR | 2026

Sigma Xi, The Scientific Research Honor Society full membership nomination | 2026

Global Student Program Outstanding Innovation Award | Nokia Bell Labs | 2025

Best Paper Honorable Mention | ACM SAP | 2024

Russell G. Hamilton Fellowship | Vanderbilt University | 2019 - 2022

Engineering Graduate Fellowship | Vanderbilt University | 2019 - Present

Professional Service

International Program Committee member for IEEE VR 2026 and IEEE ISMAR 2026.

Reviewer for IEEE TVCG, IJHCI, CHBR, ACM CHI 2025, IEEE ISMAR 2025, ACM VRST 2026, and IEEE Telepresence 2026.

Technical Skills

Programming and tools: Unity 3D, Godot 4.3; C#, R, LaTeX, Python; Photon PUN2 and Fusion, Mirror, WebRTC.

XR frameworks: Unity XR, Meta XR, HTC Wave XR, Varjo XR, AR Foundation, Vuforia, MRTK, Final IK.

Platforms and tracking: HTC Vive / Pro Eye, Meta Quest 2 / 3 / Pro, Varjo XR-3, HoloLens 1 / 2; Vicon, Antilatency, Perception Neuron hand tracking, Cyberith Virtualizer Elite 2, CAVE.

Data analysis: Mixed ANOVA, regression, correlation, multilevel modeling, thematic analysis.

Design tools: Adobe Photoshop, Adobe Lightroom, Apple iMovie, Apple Final Cut Pro.

Teaching and Mentoring Experience

Graduate Teaching Assistant | Vanderbilt University | 2019 - Present

- Created and taught multiplayer XR tutorials in Unity for the Projects in VR Design Course (2020 - Present).
- Taught game engine architecture using Godot 4.3 in the Game Engine Design Course (2025).
- Mentored undergraduate summer research interns on projects involving spatial perception, navigation, and eye tracking in immersive virtual environments (2019 - 2023).
- Advised several teams from the Projects in VR Design Course that won first prizes (2022, 2023, 2025) and second prizes (2023, 2024, 2025) at university showcases.
- Graded assignments and provided feedback and technical guidance in the Software Engineering Course (2020) and Computer Networks Course (2021).

Graduate Teaching Assistant | University of Iowa | 2017 - 2018

- Graded assignments and helped students in the undergraduate Algorithms Course over two semesters.

Selected Presentations

- Effects of Asymmetric Locomotion Methods on Collaborative Navigation and Wayfinding in Shared Virtual Environments. *Doctoral Consortium, IEEE VR 2022*.
- Distance Estimation with Social Distancing: A Mobile Augmented Reality Study. *PERCXR Workshop, IEEE ISMAR 2021*.
- Using Mobile Augmented Reality for Spatial Cognition. *8th International Conference on Spatial Cognition (ICSC), 2021*.
- Distance Estimation with Mobile Augmented Reality in Action Space: Effects of Animated Cues. *VHCIE Workshop, IEEE VR 2021*.

Selected Publications

- **S. Chakraborty**, H. Gagnon, T. P. McNamara, and B. Bodenheimer (2026). Collaborative Navigation Improves Spatial Learning across Symmetric and Asymmetric Locomotion in Virtual Reality. *IEEE TVCG*.
- S. Bandali, Y. Lyu, **S. Chakraborty**, J. Stefanucci, S. Creem-Regehr, and B. Bodenheimer (2026). Real-World Clutter Improves Egocentric Distance Judgments in Optical See-Through Augmented Reality. *ACM SAP*.
- S. Bandali, **S. Chakraborty**, A. S. McAvan, T. P. McNamara, and B. Bodenheimer (2026). Can Treadmill Walking Replicate Natural Walking? Optimizing Speed, Platform Tilt, and Training Duration on a Cyberith Virtualizer Elite 2. *IEEE VR*.
- Y. Lyu, **S. Chakraborty**, H.-S. Lee, H. Gagnon, S. Park, and B. Bodenheimer (2025). The Effect of Crowds on Peripersonal Space and Interpersonal Distance in Immersive Virtual Environments. *IEEE ISMAR*.
- **S. Chakraborty**, A. Kane, H. Gagnon, T. McNamara, and B. Bodenheimer (2024). Comparative Effectiveness of an Omnidirectional Treadmill versus Natural Walking for Navigating in Virtual Environments. *ACM SAP*.
- **S. Chakraborty**, H. Finney, H. Gagnon, S. Creem-Regehr, J. Stefanucci, and B. Bodenheimer (2024). Inter-Pupillary Distance Mismatch Does Not Affect Distance Perception in Action Space. *ACM SAP*.
- L. E. Buck, **S. Chakraborty**, and B. Bodenheimer (2022). The Impact of Embodiment and Avatar Sizing on Personal Space in Immersive Virtual Environments. *IEEE TVCG*.