Neeloy Chakraborty

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Interests: Anomaly and Hallucination Detection, Mobile Robot Teleoperation, Generative AI, Reinforcement Learning

Skills: Python, PyTorch, ROS, Linux, Git, PyTorch3D, C/C++, ZED Camera, OpenCV, CARLA, MATLAB, Docker, NVIDIA Jetson

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Education:

- **University of Illinois Urbana-Champaign**
  PhD in Electrical and Computer Engineering (Exp. May 2026) — GPA 3.88/4.00
  Master of Science in Electrical and Computer Engineering (2021 – 2023) — [Thesis] GPA 3.83/4.00
  Bachelor of Science in Computer Engineering (2017 – 2021) — [Thesis] GPA 3.75/4.00

Select Experience

- **Research Assistant in the Human-Centered Autonomy Lab** — Fall 2019 – present
  Designing frameworks for identifying anomalies on roads from multi-modal sensor data [Website]
  Developing real-time image generation methods combining depth foundation models and neural rendering
  Formulating pipelines to detect hallucinations in large visual language models

- **Research and Advanced Engineering Intern in Core AI/ML at Ford Motor Company** — Summer 2022
  Designing sample efficient model-free + model-based RL methods
  Outperforming classical PID controllers by 41% in complex autonomous vehicle use case

- **Lab Teaching Assistant for Introduction to Robotics (ECE 470)** — Fall 2021 – Fall 2022
  Guiding students to program a UR3 arm with ROS and implement kinematics and computer vision

- **Perception Engineering Intern in Autonomy Team at Brunswick i-Jet Lab** — Summer 2021
  Localizing swimmers around boats using filtering, tracking, and computer vision techniques
  Analyzing functional safety standards practiced at company and presenting findings to global management team

- **Engineering Intern in Global CAD Team at Qualcomm** — Summer 2020
  Leading design process of generalized data gathering solutions to support Design For Test pipeline [Website]
  Collaborating and adapting with international teams to consider multiple perspectives

- **Global Management Trainee Intern in Solutions at Anheuser Busch** — Summer 2019
  Identifying root causes of a multi-million-dollar annual problem with Six Sigma LEAN exercises [Website]
  Implementing short- and long-term process solutions leveraging technology with an annual ROI of $1.5M

Select Publications and Pre-prints

- **N. Chakraborty***, Y. Fang*, A. Schreiber, T. Ji, Z. Huang, A. Mihigo, C. Wall, A. Almana, and K. Driggs-Campbell. "Towards Real-Time Generation of Delay-Compensated Video Feeds for Outdoor Mobile Robot Teleoperation," Under review in ICRA 2025 [Paper] [Website] **(Leading cross-departmental team of researchers with diverse skillsets)**

- **N. Chakraborty**, M. Ornik, and K. Driggs-Campbell. "Hallucination Detection in Foundation Models for Decision-Making: A Flexible Definition and Review of the State of the Art," Under review in ACM CSUR [Paper]

- **N. Chakraborty***, R. Sidhu*, B. Abdullai*, H. Chen*, N. Ravi*, A. Ankur, D. Prasad, and J. Hockenmaier. "BEAST: Building an Embodied Action-prediction System with Trajectory data," Alexa Prize SimBot Challenge Proceedings 2023 [Paper] [Website] **(University team leader and top-10 finalist in inaugural Amazon SimBot Challenge)**

- **N. Chakraborty**, A. Hasan*, S. Liu*, T. Ji*, W. Liang, D. L. McPherson, and K. Driggs-Campbell. "Structural Attention-based Recurrent Variational Autoencoder for Highway Vehicle Anomaly Detection," AAMAS 2023 [Paper] [Website] [Code] **(Accepted as full paper with 23.3% acceptance rate and received student scholarship)**