


Vihaan Misra

CONTACT INFORMATION

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EDUCATION

Carnegie Mellon University Pittsburgh, USA

Ph.D. in Robotics

August 2023 – Current

GPA: 3.88/4.0

Thesis Direction: Advancing multi-modal robotic systems for creative applications, with a focus on enhancing collaboration and interpretability, under the guidance of [Dr. Jean Oh](#).

Netaji Subhas University of Technology (formerly NSIT) New Delhi, India

B.Tech. in Electrical Engineering with a minor in Artificial Intelligence

August 2019 – August 2023

GPA: 8.52/10 (*Top 5% in Department*)

Relevant Coursework: Applied Mathematics, Computer Programming, Engineering Analysis and Design, Data Structures and Algorithms, Matrix Computation and its Applications, Design and Analysis of Algorithms, Neural Networks and Fuzzy Logic, Microprocessor-based System Design

PUBLICATIONS

- **Vihaan Misra**, Peter Schaldenbrand, Jean Oh, “Robot Synesthesia: A Sound and Emotion Guided AI Painter” - IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024); AAAI-23 Workshop on Creative AI Across Modalities. - **Best Entertainment and Amusement Paper Award** [Paper]—[Website]
- **Vihaan Misra**, Peter Schaldenbrand, Jean Oh, “Robot Synesthesia: A Sound and Semantics Guided AI Painter” - AAAI-23 Workshop on Creative AI Across Modalities. [Paper]
- Peter Schaldenbrand, Gerry Chen, **Vihaan Misra**, Lorie Chen, Ken Goldberg, Jean Oh, “Robot Painting: Art for Robotics” - IEEE Conference on Robotics and Automation (ICRA@40) [Video] —[Paper]
- **Vihaan Misra**, Shivshankar S. Menon, Snehanshu Saha, Vaskar Raychoudhary, “AdaGen: Adaptive Generalized Knowledge Transfer Framework for Sensor-Based Surface Classification for Wheelchair Routing” - Springer Nature Computer Science [Paper]
- Abena Boadi-Agyemang, Peter Schaldenbrand, **Vihaan Misra**, Jean Oh, Aaron Steinfield “If I Move, Do You Move? Investigating the Role of Interpersonal Synchrony in Human-Robot Collaborative Art-making” - *In Review (HRI 2025)*
- **Vihaan Misra**, Peter Schaldenbrand, Jean Oh, “Text-to-Image Synthesis using Semantic Priors” Accepted at the Robotics Institute Summer Scholars Journal, Carnegie Mellon University. [Link]
- Rohan Pandey, **Vihaan Misra**, et. al. “A Machine Learning Application for Raising WASH Awareness in the Times of COVID-19 Pandemic” Scientific Reports, Nature. [Paper]
- Ashwin Misra, Anuj Agrawal, **Vihaan Misra**, “Robotics in Industry 4.0”. Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0, Springer, 2021. [Chapter Link]
- Ashwin Misra, Ankit Mittal, **Vihaan Misra**, Deepanshu Pandey, “Improving non-deterministic uncertainty modelling in Industry 4.0 scheduling” [arXiv preprint].

AWARDS

- **Best Entertainment and Amusement Paper Award**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024): Awarded for the paper “Robot Synesthesia: A Sound and Semantics Guided AI Painter” at the IROS conference.
- **MITACS Globalink Research Internship Award**, University of Waterloo: Awarded for a 12-week international research internship program.
- **National Winner**, Pan-India Hackathon at IIT Ropar: Developed a machine learning-based solution for precision agriculture, improving disease detection in crops. [Project Link].
- Top 0.5 percentile: **Joint Entrance Examination** - Unified Engineering Entrance Examination among 1 Million students.

DEMOS

- Demonstration of CoFRIDA Robot Artist at Burke Rehabilitation Center’s “Reinventing Rehabilitation via Innovation and Meaningful Technology” series on Therapeutic Recreation. (*July 2024, New York*).
- Demonstration of “Robot Synesthesia” at National Robotics Week, Carnegie Mellon University. (*April 2024*)
- Demonstration of “Robot Synesthesia” at Amazon’s Machine Learning, Automation, Robotics and Space Exploration (MARS) Conference. (*March 2024*).
- Organized a meeting on “Assessment of Robotics Capabilities”, co-located with IEEE ICRA 2023. [Website].
- Demonstration of the painting robot at IJCAI-ECAI 2022. [Link].

WORK
EXPERIENCE

Mercedes-Benz Research and Development Bangalore, India

Research Intern - (Computer Vision)

Jan 2023 - August 2023

- Developed Lane level road network elements understanding (traffic line detection, traffic type recognition, traffic signs detection, and recognition) from street view imagery.
- Extraction of road network data from spatial-temporal trajectory data.
- Map matching (multi-source road network matching, matching between trajectory data and road network).

Carnegie Mellon University Pittsburgh, United States of America - **Bot-Intelligence Group**

Research Intern - (Generative AI, Robotics)

May 2022 - January 2023

- Collaborated in developing FRIDA, a fully differentiable simulation environment for painting, adopting the idea of real to simulation to real (real2sim2real).
- Extended the FRIDA framework by guiding the painting process by multimodal inputs like text, audio, sketches, style and more.
- **Sketch2Photo**[\[Link\]](#) :Worked on building a module to convert hand-drawn sketches to life-like images image-text-sketch recognition and image synthesis techniques under **Dr. Aayush Bansal**(PhD in Robotics, CMU) and **Dr David Alexander Forsyth**, Professor, UIUC.

University of Alberta Edmonton, Canada - **Rehabilitation Robotics Lab**

Research Intern - (Reinforcement Learning, Natural Language Processing)

July 2021 - April 2022

- Worked on building a conversational AI chat-bot for helping patients with social anxiety under the guidance of **Dr. Nathaniel Maeda**.
- Collaborated with working professionals from **HealthGauge** to test and get feedback on the chatbot from patients.

International Institute of Information Technology Hyderabad -**Robotics Research Center**

Research Intern - (Computer Vision, Robotics)

February 2021 - November 2021

- Worked on automatic object rearrangement using a UR5 Robotic Arm using Deep Reinforcement Learning and Computer Vision under the guidance of **Prof. Dr. K Madhav Krishna**.
- Reduced the dependence of planning algorithms on Euclidean distance and proposed a learning-based method to model the joint-space cost for an optimal planning framework.[\[Video\]](#)

University of Miami Florida, United States of America

Research Intern - (Computer Vision, Transfer Learning)

February 2021 - October 2021

- Worked on using Transfer Learning to classify the surface type for assisting wheelchair users under the guidance of **Prof. Dr. Vaskar Raychoudhury**.
- Formulated a new activation function which adapts according to the dataset and results in better performance and more economical resource usage when compared to previous methods. - [Paper](#)

Indraprastha Institute of Information Technology New Delhi, India - **TavLab**

Research Intern - (Reinforcement Learning, Natural Language Processing)

May 2020 - March 2021

- Developed the Washkaro TB Application with innovative RL-based quizzes, smart chat-bot with Deep learning, and sentiment analysis under the guidance of **Prof. Dr. Ponnurangam Kumaraguru**, and **Prof. Dr. Tavpritesh Sethi**.
- Supervised a team to collaborate with an NGO to get data directly from TB patients and raise awareness about the disease and its possible treatment. [\[Application\]](#).

SERVICE

- **Graduate Student Delegate, Robotics Department, CMU**: Represent the largest graduate student group in various decision-making processes.
- **Executive Member, Indian Graduate Student Assembly (IGSA), CMU**: Oversee operations, coordinating events and managing resources for the student assembly.
- **Organizer**, Robotics and AI Workshops for High School Students, **CMU**: Organized workshops introducing high school students to robotics and AI.
- **Founder & President, NSUT.AI**, : Initiated research, mentored 4000+ students, led 6 projects, and established NSUT's first research-focused club.

PROGRAMMING

Python, C/C++, MATLAB, ROS, Java, JavaScript, Octave

Frameworks: PyTorch, TensorFlow, Keras, StableBaselines, Scikit, NumPy

HOBBIES

Enthusiast of soccer, tennis, Formula 1, and exploring music with various instruments.