Siddhant Haldar

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RESEARCH INTERESTS

Robotics, Robot Learning, Reinforcement Learning, Computer Vision.

EDUCATION

NYU Courant Institute of the Mathematical Sciences — 2021 - 2026
Ph.D. Student in Computational Intelligence, Learning, Vision, and Robotics (CILVR) Laboratory — CGPA: 3.95/4.0
Advisor: Prof. Lerrel Pinto

Indian Institute of Technology Kharagpur — 2016 - 2021
Dual Degree(B.Tech+M.Tech) in Electrical Engineering — CGPA: 9.08/10.0
Minor Degree in Computer Science and Engineering — Additional CGPA: 9.63/10.0

AWARDS AND HONORS

Best Paper Award at ICRA	2024
Jacob T. Schwartz PhD Fellowship, NYU	2024
Best Student Paper Award at RSS	2023
Finalist, Best Paper Award at CoRL	2022
Finalist, Best Paper Award at the RoboAdapt workshop at CoRL	2022
IIT Kharagpur Foundation (IITKGPF) International Scholarship	2020
Mitacs Globalink Research Scholarship	2019

PUBLICATIONS

[12] **BAKU: An Efficient Transformer for Multi-Task Policy Learning**
by Siddhant Haldar, Zhuoran Peng, Lerrel Pinto
Neural Information Processing Systems (NeurIPS) 2024

[11] **DynaMo: In-Domain Dynamics Pretraining for Visuo-Motor Control**
by Zichen Jeff Cui, Hengkai Pan, Aadhithya Iyer, Siddhant Haldar, Lerrel Pinto
Neural Information Processing Systems (NeurIPS) 2024

[10] **OPEN TEACH: A Versatile Teleoperation System for Robotic Manipulation**
by Aadhithya Iyer, Zhuoran Peng, Yinlong Dai, Irmak Guzey, Siddhant Haldar, Soumith Chintala, Lerrel Pinto
Conference on Robot Learning (CoRL) 2024

[9] **PolyTask: Learning Unified Policies through Behavior Distillation**
by Siddhant Haldar, Lerrel Pinto
New England Manipulation Symposium (NEMS) 2024

[8] **Open X-Embodiment: Robotic Learning Datasets and RT-X Models**
by Abhishek Padalkar et al
IEEE International Conference on Robotics and Automation (ICRA) 2024 (Best Paper Award)

[7] **Teach a Robot to FISH: Versatile Imitation from One Minute of Demonstrations**
by Siddhant Haldar[*], Jyothish Pari[*], Anant Rai, Lerrel Pinto
Robotics Science and Systems (RSS) 2023 (Best Student Paper Award)

[6] **Watch and Match: Supercharging Imitation with Regularized Optimal Transport**
by Siddhant Haldar, Vaibhav Mathur, Denis Yarats, Lerrel Pinto
Conference on Robot Learning (CoRL) 2022 (Finalist, Best Paper Award)

[5] **Network Embedding of Distributional Thesaurus Combined with Word Vectors Leads to Better Representation**
by Abhik Jana, Siddhant Haldar, Pawan Goyal
Expert Systems with Applications(ESWA) 2022

[4] **Lightweight Modules for Efficient Deep Learning based Image Restoration**
by Avisek Lahiri, Sourav Bairagya, Sutanu Bera, Siddhant Haldar, Prabir Kumar Biswas
IEEE Transactions on Circuits and Systems for Video Technology (TCSVT) 2020

[3] **Design and Implementation of Autonomous Ground Vehicle for Constrained Environments**
by Siddhant Haldar et al
IEEE International Conference on Robotic Computing (IRC) 2019

[2] **Ground Vehicle Odometry using a Non-Intrusive Inertial Speed Sensor**
by Het Shah*, <u>Siddhant Haldar</u>*, Rohit Ner*, Siddharth Jha*, Debashish Chakravarty
IEEE International Conference on Industrial Technology (ICIT) 2019

[1] **Off-Road Lane Detection Using Superpixel Clustering And RANSAC Curve Fitting**
by Sanskar Agrawal*, Indu Kant Deo*, <u>Siddhant Haldar</u>*, G. Rahul Krantikiran*, Debashish Chakravarty
International Conference on Control, Automation, Robotics and Vision (ICARCV) 2018

* denotes equal contribution

INVITED TALKS

Oral Paper Talk (PolyTask) at New England Manipulation Symposium (NEMS)	May 2024
NYU Tell GSAS Sciences Seminar	Apr 2024
University of Michigan Seminar	Mar 2024
Oral Paper Talk (FISH) at RSS 2023	Jul 2023
MIDI Lab Reading Group at UT Austin	Jul 2023
Nuro AI Reading Group	Jun 2023
Oral Paper Talk (ROT) at CoRL 2022	Dec 2022

RESEARCH EXPERIENCE

Nuro | Research Intern, Behavior ML Team *Mentor*: Dr. Dhanvin Mehta | June 2023 - August 2023
Design and deployment of multi-modal goal-conditioned policies for complex on-road agents such as pedestrians and cyclists.

Microsoft Research | Research Intern, ML & AI Lab *Mentor*: Dr. Amit Sharma | April 2021 - July 2021
Developed modules for causal identification and discovery and optimized backdoor variable identification in the Microsoft DoWhy Library.

University of Michigan | Research Intern, MIDAS *Advisor*: Prof. Atul Prakash | May 2020 - July 2020
Developed data transformation based defenses for robust white-box adversarial attacks for computer vision systems.

IBM Research | Research Intern, AI for Supply Chain *Mentor*: Dr. Sumanta Mukherjee | April 2020 - July 2020
Designed an ensemble GNN deconfounder algorithm for forecasting and intervention analysis on multivariate time series data.

University of British Columbia | Research Intern, ISDPRL Lab *Advisor:* Prof. Zheng Liu | May 2019 - July 2019
Devised an attention-guided object detection framework for small object detection in multimodal images.

Autonomous Ground Vehicle (AGV) | Software Team Lead *Advisor*: Prof. Debashish Chakravarty | March 2017 - April 2019
Developed computer vision and deep learning based pipelines for lane detection, traffic sign recognition, and traffic light detection for autonomous vehicles. Additionally, developed a plug-and-play hardware module for speed and steering control in autonomous vehicles.

TEACHING

CSCI-GA 3033: Deep Decision Making and Reinforcement Learning	Co-Instructor	NYU	Spring 2024
CSCI-UA 473: Introduction to Machine Learning	Teaching Assistant	NYU	Fall 2022
EE11001: Electrical Technology	Grading Assistant	IIT Kharagpur	Spring 2021
EE11001: Electrical Technology	Grading Assistant	IIT Kharagpur	Fall 2020

SERVICE AND LEADERSHIP

Mentoring Students: Jyothish Pari (now PhD at MIT), Vaibhav Mathur (now Research Engineer at Apptronik), Anant Rai (now Research Engineer at 1X), Zhuoran Peng (now MS at NYU), Shreyas Pimpalgaonkar, William Wang, Taseen Islam
Reviewer: ICLR 2025, ICRA 2025, NeurIPS 2024, ICML 2024, ICLR 2024, ICRA 2024, NeurIPS 2023, ICML 2023, NeurIPS 2022, RSS 2022, AAAI 2021

THESIS

Master Thesis Project | IIT Kharagpur; University of Las Vegas, Nevada Sep 2020 - April 2021
Advisor: Prof. Anirban Mukherjee, Prof. Brendan Morris
Worked on long-term Action Quality Assessment, focusing on multi-task learning from long videos. [thesis]

Bachelor Thesis Project | IIT Kharagpur July 2019 - April 2020
Advisor: Prof. Pabitra Mitra
Developed a parameter efficient Gaussian mixture based temporal attention module for performing temporally coherent video inpainting. This approach performed at par with the SOTA algorithms with a **50% reduction in parameter count**. [thesis]

OTHER RESEARCH PROJECTS

CUDA based CNN for Traffic Sign Recognition | Parallel Programming *Advisor*: Prof. Soumyajit Dey | March-April 2019

Constructed a parallelized Convolutional Neural Network(CNN) for Traffic Sign Recognition using CUDA and C++. [repo]

Breast Cancer Detection | Image Classification   *Advisor*: Prof. Debdoot Sheet | July-August 2018
Developed a breast cancer detection network for the Digital Database for Screening Mammography(DDSM) dataset using a multi-view ResNet18 architecture. Obtained a maximum accuracy of **95%**. [repo]

Noun Compound Interpretation using Deep Neural Networks | NLP   *Advisor*: Prof. Pawan Goyal | May-July 2018
Designed a semantic relation classifier for compound nouns. **Improved** upon SOTA accuracy on the Tratz and Hovy Dataset by **2%**. [repo]

Nuclei Identification using Instance Segmentation | Image Segmentation   *Advisor*: Prof. Debdoot Sheet | May-June 2018
Implemented a binary classification pipeline for nuclei identification using U-Net architecture(mAP - 0.453) and Mask-RCNN based on Feature Pyramid Network(FPN) with a ResNet 101 backbone(mAP - **0.614**). [repo]

COMPETITIONS

Hardware Modelling Competition 2019 | ArMyo, IIT Kharagpur   April 2019
Stood **4th** amongst 15 teams. Developed an EMG Signal based robotic arm to assist people suffering from muscular atrophy. [Report]

Inter IIT Technology Meet 2018 | Eye in the Sky, IIT Bombay   December 2018
Secured **Bronze** medal amongst 23 teams. Developed an ensemble satellite image segmentation model with channel-level attention. [Report]

Intelligent Ground Vehicle Competition 2018 | Eklavya, Oakland University   June 2018
Secured **Silver** medal out of 43 teams in the Auto-Nav challenge. Developed a lane detection algorithm using SLIC and RANSAC. [Report]

Hardware Modelling Competition 2018 | ARMOID, IIT Kharagpur   April 2018
Secured **Gold** medal amongst 15 teams. Developed an EEG signal based robotic arm to regain motion in paralyzed arms. [Report]

COMMUNITY SERVICE

- Mentored a 7-day long Autonomous Robotics IEEE Workshop in December 2017. Introduced 50+ freshers and sophomores to microcontroller programming and helped them build a self-balancing autonomous robot.
- Social Service Volunteer at National Service Scheme(NSS). Participated in teaching students in rural areas, repairing roads in villages and organization of health awareness camps in rural areas.