NIKITA SARAWGI

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RESEARCH INTERESTS

My research focuses on building robotic systems that reason through uncertainty and out-of-distribution conditions rather than fail silently. I am broadly interested in how robots can compose learned behaviors and representations to generalize across novel environments and task variations - with a focus on perception, manipulation and sequential decision-making in real-world settings.

EDUCATION

UNIVERSITY OF SOUTHERN CALIFORNIA — January 2024 - December 2025
Master of Science, Computer Science — *GPA: 4.0/4.0*

MANIPAL INSTITUTE OF TECHNOLOGY — July 2016 - July 2020
Bachelor of Technology, Computer Science and Engineering (Minor in Intelligent Systems) — *GPA: 3.9/4.0 (9.1/10)*

EXPERIENCE

GRAYMATTER ROBOTICS — *Los Angeles, CA*
Robotics Engineer — October 2025 - Present

- Developed and deployed a coarse-to-fine active reconstruction pipeline for industrial parts with complex self-occlusions - extending standard voxel-coverage NBV with sub-voxel geometric refinement and robot-reachability constrained view selection, with scanning objectives parameterized by downstream process requirements
- Designing a conformal prediction-based scan diagnostic framework that detects distribution shift by comparing predicted vs. actual information gain, routing failures to targeted recovery actions across sensor, model, and environmental uncertainty classes

REALIZATION OF ROBOTICS SYSTEMS LAB, USC — *Los Angeles, CA*
Graduate Research Assistant | Advisor: Dr. Satyandra K. Gupta — May 2024 - September 2025

- Developed STEP (Space-Time Efficient Packing), a preference-conditioned Transformer policy for online 3D bin packing that generalizes across spatial-temporal trade-off objectives at inference time without retraining, yielding Pareto-optimal packing strategies that improve throughput without compromising density (ICRA 2026)
- Trained a sim-to-real pose estimation model for robotic insertion of non-convex geometries - pre-trained on simulation data to predict pose uncertainty, fine-tuned on real data for robustness to unseen lighting conditions (AIAA SciTech Forum 2025)

SLURM LAB, USC — *Los Angeles, CA*
Graduate Research Assistant | Advisor: Dr. Daniel Seita — January 2025 - December 2025

- Evaluated STEP across buffer sizes and varying preference vectors; achieved 44% reduction in operational time without compromising packing density, establishing trade-offs across space-time objectives (ICRA 2026)

MICROSOFT — *Hyderabad, India*
Software Development Engineer II — July 2020 - December 2023

- Developed Azure VM extension in Go for Windows and Linux, with real-time tracking modules achieving sub-minute state comparisons, via kernel-level data extraction as part of the Change Tracking and Inventory team within Azure
- Directed development of a copilot integrating Azure Migrate and Azure Business Case to estimate workload migration costs to Azure using predictive models

BOLTZMANN LABS — *Bangalore, India*
Research Intern — January 2020 - July 2020

- Built an open-source Python library unifying drug-target interaction prediction models and single-cell RNA-seq analysis

PUBLICATIONS

- **Nikita Sarawgi**, Omey M. Manyar, Fan Wang, Thinh H. Nguyen, Daniel Seita, Satyandra K. Gupta. *Preference-Conditioned Reinforcement Learning for Space-Time Efficient Online 3D Bin Packing.* ICRA 2026.
- Abhay Negi, **Nikita Sarawgi**, Dhanush Penmetsa, Hantao Ye, Ashtin K. Cheng, and Satyandra K. Gupta. *Autonomous Execution of Insertion Operations in Space Assembly Tasks*. AIAA SciTech Forum 2025.

TECHNICAL SKILLS

Python, Go, C++, C#, SQL, Powershell, PyTorch, ROS/ROS2, MoveIt, Gymnasium, Azure, Git, Linux, MujoCo, IsaacSim

HONORS

- Microsoft IDC LLM-Hackathon Winner (2023): Developed *AI-Customer*, a copilot simulating customer environments for pre-rollout product testing
- Growth Mindset Award, Microsoft (2021 & 2022): Recognized for mentorship and learning agility
- Academic Excellence & Gold Medal: Ranked 5th in the CS Department in the 4th semester of undergraduate
- Merit cum Means Scholarship: Ranked 296/130,000 in the entrance exam for Manipal Academy of Higher Education