

Sai Navaneet

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About Me

Driven by curiosity and innovation, I will soon complete my Master's in Electronics and Electrical Engineering, specializing in NLP-based robotic control. My passion lies in blending machine learning with robotics to create intelligent systems that solve real-world challenges. I thrive on research, discovery, and turning complex ideas into practical solutions.

Education

Kyungpook National University , Masters in School of Electronics and Electrical Engineering Daegu, South Korea	Mar 2024 – Dec 2025
• GPA: 4.07/4.3	
Kyungpook National University , Bachelor of Science in School of Electronics Engineering (Double Degree) Daegu, South Korea	Mar 2022 – Feb 2024
• GPA: 3.8/4.3	
Christ University , Bachelor of Technology in Electronics and Communication Engineering Bangalore, India	July 2019 – Dec 2021
• GPA: 3.7/4	

Experience

Research & Robotics Engineer , Airobotics – Daegu, South Korea	April 2025 – Present
• Working on autonomous car manufacturing systems using Yaskawa industrial robots.	
• Developed and integrated object detection models to identify weld beads for quality assurance and robotic guidance.	
• Collaborate on the automation of inspection processes within the vehicle assembly line.	
Robotics Engineer , Dexweaver – Daegu, South Korea	July 2024 – Dec 2024
• Developed a vision-guided tissue processing system using ViperX robotic arms and the Action Chunking Transformer (ACT) algorithm.	
• Implemented a leader-follower teleoperation setup for data collection and trained ACT for autonomous manipulation of deformable materials.	
• Achieved an autonomous operation success rate of 85.7%, with performance comparable to human teleoperation (92.4%).	
• Engineered multi-modal datasets (joint angles, gripper states, synchronized RGB feeds) and designed transformer-based policies for action prediction.	
Researcher , Physical Intelligence Lab – Kyungpook National University, South Korea	Feb 2024 – Present
• Developed MambaVLA , a scalable Vision-Language-Action framework built on state-space models (Mamba), achieving 94% success on LIBERO and 88% on RoboCasa benchmarks.	
• Designed and implemented advanced state-space model pipelines for sequential decision-making and trajectory prediction in robotic manipulation.	
• Built and optimized transformer and diffusion-based policy architectures to improve adaptability and robustness in dynamic real world environments.	
• Led the development of precision motion planning and control algorithms for manipulators, integrating perception, language understanding, and action generation.	

- Collaborated on the end-to-end design, training, and deployment of robotic intelligence systems for both academic research and industrial applications.

Research Intern, Physical Intelligence Lab – Kyungpook National University, South Korea

Sep 2022 – Feb 2024

- Developed imitation learning algorithms for robotic arms to replicate human-like behaviors.
- Designed and tested iterative learning control (ILC) combined with model predictive control (MPC) for high-accuracy tasks.
- Applied reinforcement learning techniques to differential drive robots to improve navigation and obstacle avoidance.
- Enhanced aerial robotics by refining detection and tracking algorithms for UAVs.

Publications

MambaVLA: A Scalable and Efficient Vision-Language-Action Model with State Space Architecture	Jan 2026
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee, Ju H. Park <i>Published at CCNC 2026</i>	
LegMamba: A Scalable and Efficient State Space model for Quadrapedal Locomotion	Nov 2025
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee <i>POSTER IROS 2025</i>	
QROOT: An Integrated Diffusion Transformer and Reinforcement Learning Approach for Quadrupedal Locomotion	Dec 2025
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee, Ju H. Park <i>To appear at NeurIPS 2025 (under review)</i>	
Vision-Guided Predictive Action Imitation Learning with Discrete Latent Encoding for Multitasking Robots	Jun 2025
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee <i>Submitted to Neural Networks</i>	
Discrete Latent Diffusion Motion Planning	Jun 2025
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee, Ju H. Park <i>Published at The International Conference on Nonlinear Dynamics (NODYCON 2025)</i>	
Vision-Guided Imitation Learning Using Action Chunk Transformers	Oct 2024
<i>Sai Navaneet</i> , Manisha Lingala, Sangmoon Lee, Hongseok Yoo <i>Published at IEMEK Symposium on Embedded Technology 2024 (IEMEK 2024)</i>	
Hybrid Model Predictive and Iterative Learning Control for Enhanced Leader-Follower Robotic Tracking	May 2024
<i>Sai Navaneet</i> , Sangmoon Lee <i>Published at KNU-EERC 2024</i>	

Projects

MambaVLA: Vision–Language–Action Model with Mamba State Space Architecture	github.com/MambaVLA
<ul style="list-style-type: none"> • Built an efficient VLA pipeline combining Mamba SSM, Eagle2 visual backbone, Qwen-7B encoder, and diffusion-based action generation. • Achieved faster inference and lower compute requirements than Transformer-based models across multiple robotics benchmarks. 	

Transformer Based Vision Guided Tissue Processing

github.com/Harvesting

- Developed an automation of tissue packing using ViperX robotic arms

Action Chunk Transformer on Franka Robot

github.com/ActFranka

- Implemented Act on Franka robot to do vision guided imitation learning on pick and place tasks

QROOT: An Integrated Diffusion Transformer and Reinforcement Learning Approach for Quadrupedal Locomotion

- Introduced a control stack that combines diffusion transformer with a reinforcement learning-based stabilizer(PPO), enabling smooth and robust execution on real-world hardware

Vision-Guided Predictive Action Imitation Learning with Discrete Latent Encoding for Multitasking Robots

github.com/PAIL

- Introduced a control stack that combines diffusion transformer with a reinforcement learning-based stabilizer(PPO), enabling smooth and robust execution on real-world hardware

Technologies

Languages: Python,C, C++ , HTML, CSS , Java , R , MATLAB

Technologies: ROS/ROS2, Gazebo ,Rviz, Mujoco , Isaac Sim , Pytorch , TensorFlow, Linux(UBUNTU , ARCH , KALI , REDHAT)

AI / Machine Learning

Expertise: Vision Language Action (VLA) Models, State Space Models (Mamba), Transformers, Diffusion Models, Imitation Learning, Reinforcement Learning, Multimodal Learning

Frameworks: PyTorch, TensorFlow, HuggingFace , Docker , OpenCV , LiDAR , Git, SLAM,

Specialization: Robot Learning, Policy Optimization, Multimodal Fusion, Vision Encoders (Eagle, DINO, CLIP, SigLip), Language Models , Sensor fusion , Path Planning , Embedded Linux