

Sanjar Atamuradov

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EDUCATION

- **KAIST**, South Korea Aug 2020 – Present
B.S. in Computer Science (Major GPA: 3.5/4.0)
- **Georgia Institute of Technology**, Atlanta, GA Aug 2024 – Present
Visiting Researcher / Student, Computer Science (Major GPA: 3.7/4.0)

RESEARCH/WORK EXPERIENCE

LIDAR Lab, Georgia Institute of Technology, US **January 2025 – Present**

Research Assistant

- (Paper in submission) Developed a diffusion-based motion planning framework that generates keypoint trajectories (root, hands, feet) for humanoid loco-manipulation, using action chunking techniques inspired by VLA models to enable complex long-horizon tasks.
- Implemented a privileged-information RL controller that leverages proprioceptive data and target keypoints to generate optimal joint positions to be passed to a PD controller

Raion Robotics (KAIST RaiLab spin-off), South Korea **March 2024 – August 2024**

AI Robotics Engineer Intern

- Developed robotic operator interface with real-time 3D visualization and camera systems, integrating physics simulation using Raylib and ImGui in C++
- Researched RL-based quadrupedal robot locomotion using privileged learning and temporal convolutional networks, focusing on zero-shot generalization to unseen terrain conditions

Digitrack Inc., Daegu, South Korea **May 2023 – August 2023**

Robotics Software Engineering Intern

- Built an Autonomous Mobile Robot (AMR) from scratch for warehouse automation, integrating hardware (motors, sensors) and software (ROS2, Nav2) to achieve autonomous navigation
- Wrote a hardware interface for `ros2_control`, managing feedback reading and wheel command writing to motor controller over RS485 serial communication
- Developed vision-based precision docking system using AprilTag detection, achieving 0.5cm positioning accuracy for automated charging

PROJECTS

Mobile Manipulation using LeRobot Framework 

- Implemented LeRobot framework to train a navigation policy for a mobile robot, utilizing imitation learning with teleoperated demonstrations for efficient data collection.
- Optimized UART for low-latency communication and reliable device management with udev rules.

Bipedal Robot Walking Control 

- Achieved stable bipedal walking by developing an optimization framework that generates joint trajectories through 6th-order polynomial parameterization, optimizing for COM stability and joint constraints via forward kinematics
- Implemented cyclic walking by generating symmetric left-right swing trajectories and joining multiple steps with smooth transitions, achieving continuous bipedal locomotion

Autonomous Gesture-controlled Drone 

- Developed a state machine based mission planner for various aerial maneuvers, such as human approach, photo capture based on detected pose
- Implemented Visual SLAM for autonomous navigation and developed PD control system for stable drone flight control

TECHNICAL PROFICIENCIES

- **Languages & Tools:** C/C++, Python, JAVA, MATLAB, Git, Docker, etc
- **Robotics:** ROS2, SLAM, Navigation, Control Systems, Robot Kinematics/Dynamics, etc
- **AI/ML:** PyTorch, TensorFlow, Computer Vision, Reinforcement Learning, Path Planning, etc
- **Software:** Data Structures, Algorithms, MySQL/Databases, System Design, OpenCV, etc