LAUKIK BHALCHANDRA NAKHWA

laukiknakhwa@gmail.com ◇ +91 9869193993 ◇ Website ◇ LinkedIn ◇ GitHub

EDUCATION

National University of Singapore — Singapore
Research Scholar — August 2024 - Present
Birla Institute of Technology and Science, Pilani — Goa, India
Bachelor of Engineering in Electronics and Instrumentation Engineering — October 2020 - June 2025
Master of Science in Biological Sciences

SKILLS

Programming	C/C++, Python, Java, ML, RL, DRL, OpenCV, PyTorch, TensorFlow, ROS
Simulation Frameworks	PyBullet, IsaacGym, MuJoCo, CoppeliaSim, Gazebo, MATLAB, Cadence Virtuoso

EXPERIENCE

Research Intern — February 2024 - Present
MARMot Lab, National University of Singapore | Dr. Guillaume A. Sartoretti — *Singapore*

- Developed a simple yet versatile imitation learning framework that integrates demonstrations directly into reinforcement learning (RL), maintaining high exploration while grounding behavior with expert-informed priors.
- Implemented Deep Reinforcement Learning (DRL) parallel training algorithms to enhance legged robot locomotion, achieving successful simulation and hardware testing on hexapods and quadrupeds. *training videos*
- Investigated sim-to-real gap improvements for RL-based legged robot locomotion policies by utilizing advanced Curriculum Learning, Unsupervised Environment Generation and Generative Adversarial Imitation Learning.
- Developed an automated robotic locomotion and manipulation framework using central pattern generators for deploying twist-locks in container yards as part of a project in collaboration with the Port of Singapore (PSA).
- Implementing DRL-based co-evolving environment generation for robots leveraging Diffusion Models.

Summer Intern — May 2023 - July 2023
Pyrotech Electronics Pvt. Ltd. — *Remote*

- Aided the development of an E-Medical Kiosk to integrate health monitoring systems, sphygmomanometers, temperature sensors, and prescription dispensing systems, enhancing patient access to vital healthcare services.

PUBLICATIONS

- **APEX: Action Priors Enable Efficient Exploration for Skill Imitation on Articulated Robots**.
  Shivam Sood*, Laukik B Nakhwa*, Yuhong Cao, Sun Ge, Guillaume Sartoretti. *Equal contribution*
  Under review, 2025 [Paper]

PROJECTS

SpiderBot: Led a team of 25 students over two years to design and build a custom 6-legged hexapod robot. Led development, electronics and mechanical domain teams, resulting in the first successful hardware implementation. Deployed a Bio-inspired Central Pattern Generator (CPG) controller, enabling efficient and adaptive gait generation and transition. Successfully achieved external control capability and motion demonstrations. *Repository | photos/videos*

Predicting Autoimmune Diseases | Dr. Meenal Kowshik
Developed predictive models for autoimmune diseases, including Pediatric Inflammatory Bowel Disease (PIBD) and its subtypes, using histological and endoscopic data. Implemented a supervised Random Forest algorithm for classifying autoimmune disease types, enhancing prediction accuracy through statistical genetic classification and data processing. Applied Principal Component Analysis (PCA) to identify significant genes associated with diseases such as Rheumatoid Arthritis and Sjogren's Syndrome. Additionally, designed a method to predict narcolepsy and uncover key susceptibility genes to improve targeted diagnostics. *PIBD Repository — Narcolepsy Repository*

Motion Tracking for Yoga | Dr. Kunal Korgaonkar

Led the development of a motion tracking system for the CSIS Robotics Lab, BITS Goa. Set up an environment utilizing LiDAR, depth cameras, and OpenCV to capture and process image data for real-time yoga pose tracking and detection via media pipe. Designed algorithms for automated corrective feedback mechanisms to aid yoga pose accuracy. Improved system performance by curating multiple comprehensive datasets from various sources and refining pose accuracy algorithms. *Repository*

AWARDS

- Secured second place in the Open Design Contest 2023 organised by The Department of Electrical Electronics Engineering, BITS Pilani, K. K. Birla Goa Campus. (certificate)

VOLUNTEERING

- Guided over 300 participants in a workshop on Autonomous Maze Solving using ROS as part of Quark Technical Fest 2022. (certificate)
- As a Core Member of Electronics and Robotics Club, BITS Goa for over 3 years I contributed to multiple projects including StrikeBot, TrotBot.
- As a Lab Committee member of the Sandbox Innovations Lab, the only student-led project lab at the university, I contributed to teaching equipment usage and handling to facilitate student-driven research projects.