

NISAL PERERA

Full Name : Kankanige Nisal Minula Perera

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- [ResearchGate/Nisal_Perera2](#)
- [Google Scholar](#)

EDUCATION	University of Massachusetts Amherst, MA, USA	Sep 2022 – Current
	MS/PhD in Computer Science	
	University of Moratuwa, Moratuwa, Sri Lanka	Nov 2015 – Jan 2020
	B.Sc. Eng (Hons.) in Mechanical Engineering	
	• Academic Standing : First Class	
	• Cumulative GPA : 3.78 / 4.20	
	• Stream : Mechatronic Systems Engineering	

RESEARCH INTERESTS	Legged Robotics, Dynamics, Control Systems, Reinforcement Learning
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| PUBLICATIONS | <ol style="list-style-type: none">1. N. Perera et al., "StaccaToe: A Single-Leg Robot that Mimics the Human Leg and Toe," 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Abu Dhabi, United Arab Emirates, 2024, pp. 9058-9065.
doi: 10.1109/IROS58592.2024.108014442. S. Yu, N. Perera, D. Marew and D. Kim, "Learning Generic and Dynamic Locomotion of Humanoids Across Discrete Terrains," 2024 IEEE-RAS 23rd International Conference on Humanoid Robots (Humanoids), Nancy, France, 2024, pp. 1048-1055.
doi: 10.1109/Humanoids58906.2024.107699163. D. Marew, N. Perera, S. Yu, S. Roelker and D. Kim, "A Biomechanics-Inspired Approach to Soccer Kicking for Humanoid Robots," 2024 IEEE-RAS 23rd International Conference on Humanoid Robots (Humanoids), Nancy, France, 2024, pp. 722-729.
doi: 10.1109/Humanoids58906.2024.107699644. S. Dodampegama, A. Mudugamuwa, M. Konara, N. Perera, D. De Silva, U. Roshan, R. Amarasinghe, N. Jayaweera and H. Tamura "A Review on the Motion of Magnetically Actuated Bio-Inspired Microrobots," Applied Sciences, vol. 12, no. 22. MDPI AG, p. 11542, Nov. 14, 2022.
https://doi.org/10.3390/app122211542 |
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5. N. M. P. Kankanige, G. C. P. Hanchapola Appuhamilage, S. K. Dodampegama, and R. A. Yattowita Withanage, "Design and Simulation of a Novel Magnetic Microactuator for Microrobots in Lab-On-a-Chip Applications", *Adv. Technol.*, vol. 2, no. 3, pp. 221–232, May 2022.
<https://doi.org/10.31357/ait.v2i3.5521>
6. **K. N. M. Perera**, D. L. F. M. Liyanage, P. V. K. Asanka, D. N. Rajapaksha, Y. W. R. Amarasinghe, R. A. R. C. Gopura and S. A. Nanayakkara, "Design of a Track-Leg Hybrid Locomotive Mobile Robot," 2020 20th International Conference on Control, Automation and Systems (ICCAS), Busan, Korea (South), 2020, pp. 274-279.
[doi: 10.23919/ICCAS50221.2020.9268332](https://doi.org/10.23919/ICCAS50221.2020.9268332)
7. **K. N. M. Perera** et al., "Design and Analysis of a MEMS Based Transdermal Drug Delivery System," 2020 Moratuwa Engineering Research Conference (MERCon), Moratuwa, Sri Lanka, 2020, pp. 596-601.
[doi: 10.1109/MERCon50084.2020.9185328](https://doi.org/10.1109/MERCon50084.2020.9185328)
8. I. M. D. C. Jayasundara, A. P. Mudugamuwa, H. Baokun, **K. N. M. Perera** and Y. W. R. Amarasinghe, "Design and Development of a Novel External Pipe Crawling Robot ExPiRo," 2020 5th International Conference on Robotics and Automation Engineering (ICRAE), Singapore, 2020, pp. 121-125.
[doi: 10.1109/ICRAE50850.2020.9310831](https://doi.org/10.1109/ICRAE50850.2020.9310831)
9. **K. N. M. Perera**, Y. W. R. Amarasinghe and D. V. Dao, "An Artificial Appendage for Swimming Microrobots in Non-Newtonian Fluids," 2021 Moratuwa Engineering Research Conference (MERCon), Moratuwa, Sri Lanka, 2021, pp. 723-727.
[doi: 10.1109/MERCon52712.2021.9525635](https://doi.org/10.1109/MERCon52712.2021.9525635)
10. Samith Hettiarachchi, Gehan Melroy, Amith Mudugamuwa, **Nisal Perera**, Peshan Sampath and Ranjith Amarasinghe, "3D Printed Multi-channel Peristaltic Pump with Active Droplet Generator for Lab-on-a-Chip Devices," in *KES-SDM 2021: Sustainable Design and Manufacturing. Smart Innovation, Systems and Technologies*, vol. 262. S. G. Scholz, R. J. Howlett and R. Setchi, Eds. Springer, Singapore, 2022, pp. 235-244.
[doi: 10.1007/978-981-16-6128-0_23](https://doi.org/10.1007/978-981-16-6128-0_23)
11. **K. N. M. Perera**, H. A. G. C. Premachandra and Y. W. R. Amarasinghe, "Design of a Magnetostrictive Bimorph for Micromanipulation," 14th KDU International Research Conference, Rathmalana, Sri Lanka, 2021, pp. 89-93.

PATENTS

- **K. N. M. Perera**, P. V. K. Asanka, D. N. Rajapaksha, H. M. R. A. Herath, R. A. R. C. Gopura, Y. W. R. Amarasinghe and A. G. B. P. Jayasekara, "A Transformable Chassis with Reconfigurable Footprint," Sri Lankan Patent. (Patent No. 21773)

RESEARCH PROJECTS

Development of Humanoid Robots

2022/25

Designing and developing the humanoid robot PresToe and single legged robot StaccaToe. Performed tasks ranging from hardware design, system integration and control.

Mobile Microrobots for On-Chip Cell Manipulation

2021

A swimming microrobot for cell manipulation in a lab-on-a-chip device is designed. The robot is capable of swimming in a non-Newtonian fluid using an artificial appendage. Locomotion in low Reynolds number regime and the use of a novel microactuator for self-propulsion are explored.

Design and Development of an Autonomous Mobile Platform for Healthcare Sector (*Final Year Design/Research Project*)

2019/20

Inspired by the requirement for a mobile robot to navigate a space restricted and crowded environment in healthcare sector, a novel variable footprint mobile robot named ProteanBot was developed. The mobile robot consists of a novel transformable chassis enabling it to have flexible stability and navigation capabilities while delivering payloads. The localization was done using a SLAM while motion planning was done using a DWA planner in ROS.

Design and Analysis of a MEMS-based Transdermal Drug Delivery System

2019

A transdermal drug delivery system was designed and analyzed with the focus on administering Levadopa to patients with Parkinson's disease. The system consists of a reservoir, microfluidic pump, micro-needle array and micro-channels. The Levadopa administration was simulated as a fluid-particle interaction.

Design of a Track-Leg Mobile Robot for Outdoor Sample Collection

2018

A hybrid locomotive mobile robot that utilizes both tracked locomotion and legged-like movements was designed to traverse extreme terrains. The robot legged locomotion was simulated in an ADAMS environment with open-loop track-leg velocity control. A 3-DOF serial robotic arm was also designed to perform the sample collection and inspection tasks.

Design and Development of an External Pipe Crawling Robot

2018

A novel external pipe robot was developed with the focus given to pipeline inspection. A passive clutching mechanism allows the robot to move on linear pipe segments with variable diameter. An ADAMS-MATLAB co-simulation was conducted in order to evaluate the performance of the control system.

WORK EXPERIENCE

- **Graduate Research Assistant/Teaching Assistant** Sep 2022 – Present
DARoS Lab, University of Massachusetts Amherst, MA, USA.
- **Research Assistant** Aug 2020 – Feb 2022
Centre for Advanced Mechatronic Systems, University of Moratuwa.
- **Visiting Instructor** Aug 2020 – Oct 2020
Mechatronics Lab, Dept. of Mechanical Engineering, University of Moratuwa.

**CONFERENCE
WORKSHOPS/
REVIEWING**

- **Speaker and Organizer**
Workshop on Mechatronics and Micro-mechatronics, 2021 Moratuwa Engineering Research Conference (MERCon)
- **Reveiwer**
IROS'23, UR'23, IROS'24, UR'24, Humanoids'24, Humanoids'25, ICRA'25, IROS'25, T-MECH

**AWARDS AND
SCHOLARSHIPS**

- Mahapola Higher Education Scholarship on merit basis 2016 – 2019
(Undergraduate studies - B.Sc. Engineering Hons.)
- Dean's List – Semester 4, 7 and 8 (B.Sc. Engineering Hons.)

**EXTRA-
CURRICULAR
ACTIVITIES**

- Player of U-13 Isipathana College school cricket team
- Player of U-13 and U-15 cricket team of Green Field Cricket Club
- Member of the Isipathana College Science Society

**TECHNICAL
SKILLS****CAE software**

ANSYS, Altium, COMSOL Multiphysics, ABAQUS, MSC Adams, Simulink/Simscape, FESTO FluidSim, NI LabVIEW, Proteus

CAD software

SolidWorks, Onshape, AutoCAD

Programming Languages

C/C++/C#, Python, Java, MATLAB, VB.NET, Assembly, Ladder logic

Statistical Analysis Packages

IBM SPSS, Minitab

Physics Simulations

Mujoco, IsaacSim, MIT Robotsoftware

Other

ROS

LANGUAGES

- English (Fluent)
 - Sinhala (Native)
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