Rusiru Thushara

PhD Student, Johns Hopkins University,
Maryland, USA

rusiru.us
thusharakart@gmail.com
GitHub & Google Scholar

Education

Johns Hopkins University, USA *Aug. 2025 - Present*
PhD in Electrical & Computer Engineering (*Supervised by Prof. Vishal Patel*)
Research Focus: Vision-language navigation using large-scale foundational vision-language models for embodied perception and multimodal reasoning.

Mohamed bin Zayed University of Artificial Intelligence, UAE *Aug. 2023 - May. 2025*
M.Sc. in Computer Vision **CGPA: 3.90/4.00**
Thesis: Towards Geometrically Consistent Novel View Synthesis Using Gaussian Splatting

University of Peradeniya, Sri Lanka *Nov. 2017 - Feb. 2023*
B.Sc. Engineering(Hons.) Computer Engineering **CGPA: 3.85/4.00**

Experience

Embodied Perception Group, MBZUAI, UAE *June 2025 - Aug. 2025*
Visiting Researcher Advisors: Prof. Ivan Laptev, Prof. Ian Reid
Worked on Vision-Language-Navigation and Mapping using the Unitree Go2 robot.

Mohamed bin Zayed University of Artificial Intelligence, UAE *June 2024 - Aug. 2024*
Research Intern Advisor: Prof. Ivan Laptev
Worked on 3D reconstruction of outdoor and indoor environments using the Unitree Go2 robot.

Wadduwage Lab, Harvard University, USA *Jan. 2022 - July 2022*
Remote Research Fellow Advisor: Dr. Dushan N. Wadduwage
Developed deep learning applications for DNA damage repair assays, detecting γ-H2AX foci in cellular nuclei images and quantifying homologous recombination events in rare fluorescent mutant cells within RaDR mouse tissue.

Publications (View at rusiru.us)

1. **Web2Code: A Large-scale Webpage-to-Code Dataset and Evaluation Framework for Multimodal LLMs**
Sukmin Yun*, Haokun Lin*, **Rusiru Thushara***, Mohammad Qazim Bhat*, Yongxin Wang*, Zutao Jiang, Mingkai Deng, Jinhong Wang, Tianhua Tao, Junbo Li, Haonan Li, Preslav Nakov, Timothy Baldwin, Zhengzhong Liu, Eric P. Xing, Xiaodan Liang, Zhiqiang Shen.
NeurIPS 2024.
2. **PG-Video-LLaVA: Pixel Grounding Large Video-Language Models**
Shehan Munasinghe*, **Rusiru Thushara***, Muhammad Maaz, Hanoona Rasheed, Salman Khan, Mubarak Shah, Fahad S. Khan
CVPR 2025 VideoLLMs Workshop.
3. **Quantification of Cells in Native Tissues with Object Detection and Weak Supervision**
R. Thushara, J. Pradeepkumar, J. Corrigan, B. P. Engelward, D. N. Wadduwage.
*Abstract accepted for **oral presentation at the Optica Imaging Congress, 2023**.*
4. **Real-Time Multiple Dyadic Interaction Detection in Surveillance Videos in the Wild**
I. M. Insaf, A. A. P. Perera, **R. Thushara**, G. M. R. I. Godaliyadda, M. P. B. Ekanayake, H. M. V. R. Herath, J. B. Ekanayake.
International Conference on Industrial and Information Systems(ICIIS) 2023.

Research Projects

1. **Sparse View 3D Gaussian Splatting with Video Diffusion**
Advisors: Prof. Ivan Laptev, Dr. Jiawang Bian
   - Optimizing 3D Gaussian Splatting (3DGS) using a video diffusion prior to enhance view consistency and spatial coherence in multi-perspective view synthesis.
2. **Laika Explorer: Vision Language Navigation with Unitree Go2** *Presented at **IROS 2024***
Advisors: Prof. Ivan Laptev, Prof. Hao Li

- Developed a VR and iOS voice-controlled system for the Unitree Go2 EDU robot dog, enabling autonomous navigation, object interaction, and complex task execution in unstructured, real-world environments, incorporating open-vocabulary detection and visual question answering.
- Achieved immersive, real-time monitoring by live-streaming a 360-degree view from the robot onto a 270-degree MetaWall display, enhancing situational awareness in dynamic outdoor settings.

3. **Collision-Free Obstacle Robots for Swarm Robots Platform**
   Advisors: Isuru Navinna, Prof. Roshan Ragel
   - Developed an obstacle bot system for swarm robots at the University of Peradeniya, using overhead cameras for accurate localization and dynamic positioning.
   - Applied Particle Repulsion Theory to model obstacle bots as charged particles, enabling collision-free movement in specified paths.
4. **Open World Object Detection and Discovery**
   Advisors: Prof. Roshan Ragel, Prof. Salman Khan
   - Investigated self-supervised, contrastive learning approaches for open-world object detection with unknown object clustering.
   - Utilized Vision Transformers for object detection with incremental learning.
5. **Prediction of Depths, Normals, and Surface Curvature from RGB Images using CNNs**
   Advisors: Dr. Upul Jayasinghe, Eng. Sampath Deegalla
   - Applied deep neural networks to estimate depth maps, surface normals, and surface curvature from RGB images.

Awards and Honors

- **1st Place of Code Squad 3.0 (of 150+ teams)** *Nov. 2022*
  6-hour competitive programming competition for university undergraduates in Sri Lanka.
- **2nd Runner-up of MoraXtreme 7.0 (of 180+ teams)** *Oct. 2022*
  12-hour competitive programming competition for university undergraduates in Sri Lanka.
- **1st Runner-up of MoraXtreme 6.0 (of 180+ teams)** *Oct. 2021*
  12-hour competitive programming competition for university undergraduates in Sri Lanka.
- **1st Runner-up of Douthan 1.0 (of 80+ teams)** *Feb. 2021*
  12-hour competitive programming competition for university undergraduates in Sri Lanka.
- **1st Country Rank in Hack the Interview IV and VI (Asia Pacific)** *2020*
  Placed 1st country rank, and 88/4353, 195/2530 respectively in Asia Pacific region.
- **2nd Runner-up of HackDown 2020 (of 200+ teams)** *Apr. 2020*
  Competitive programming competition.
- **2nd Runner-up of hackStat 2.0 (of 90+ teams)** *Oct. 2019*
  Competition in data analysis and prediction on an insurance dataset.
- **2nd Runner-up of UoJCoders v1.0 (of 100+ teams)** *March 2019*
  Competitive programming competition for university undergraduates in Sri Lanka.
- **Gold Medal in Sri Lankan Physics Olympiad | National Rank - 2nd** *2016*
  An annual competition held among high school students to select delegations for the APhO and IPhO.

Teaching Experience and Relevant Coursework

Instructor and Teaching Assistant, University of Peradeniya *2020 - 2023*
Taught undergraduate courses in Machine Learning and Data Mining, Data Structures and Algorithms, Advanced Computer Communication Networks, Operating Systems, Network and Web Application Design, and Embedded Systems

Selected Coursework: Visual Object Recognition and Detection, Deep Learning, Mathematical Foundations of AI, Advanced 3D Computer Vision, Advanced topics in Vision and Language, Probabilistic and Statistical Inference, Advanced topics in Continuous Optimization, Discrete Mathematics

MOOCs: Deep Learning Specialization, AI for Medicine, Data Structures and Algorithms Specialization (Coursera, 2020)

References

- **Prof. Vishal M. Patel**
  Department of Electrical and Computer Engineering
  Johns Hopkins University, USA
  vpatel36@jhu.edu

- **Prof. Ivan Laptev**
  Department of Computer Vision, MBZUAI, UAE
  ivan.laptev@mbzuai.ac.ae