

# Rusiru Thushara

PhD Student, Johns Hopkins University,  
Maryland, USA

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## EDUCATION

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### 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. Graduated with First Class Honors. CGPA: 3.85/4.00

## EXPERIENCE

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### Vision and Image Understanding Lab, Johns Hopkins University

Aug. 2025 - Present

Graduate Research Assistant

Conducting research in Electrical and Computer Engineering under Prof. Vishal M. Patel.

### 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.

### University of Peradeniya, Sri Lanka

Mar. 2023 - Aug. 2023

Instructor and Teaching Assistant

Taught undergraduate courses in Machine Learning and Data Mining, Data Structures and Algorithms, Advanced Computer Communication Networks, Operating Systems, and Embedded Systems.

### 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  $\gamma$ -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](https://rusiru.us))

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- VFace: A Training-Free Approach for Diffusion-Based Video Face Swapping**  
Sanoojan Baliah, Yohan Abeysinghe, **Rusiru Thushara**, Khan Muhammad, Abhinav Dhall, Karthik Nandakumar, Muhammad Haris Khan *WACV 2026*.
- 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*.
- 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*.
- 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*.
- 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

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### 1. Towards Geometrically Consistent Novel View Synthesis Using Gaussian Splatting

*MSc. Thesis, MBZUAI.* Advisors: Prof. Ivan Laptev, Dr. Jiawang Bian      Examiners: Prof. Hao Li

- 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

Advisors: Prof. Ivan Laptev, Prof. Hao Li    *Presented at IROS 2024*

- Developed a voice-controlled virtual reality and iOS 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. Using 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

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- **Department Chair's Award, MBZUAI** *May. 2025*  
Presented by Prof. Ian Reid for the Laika Robot Explorer Project.(VLN with Unitree Go2.)
- **1st Place of Code Squad v3.0 (of 150+ teams)** *Nov. 2022*  
6-hour competitive programming competition for university undergraduates in Sri Lanka.
- **MoraXtreme v6.0 (1st runner-up) & v7.0 (2nd runner-up), 180+ teams each** *Oct. 2021-22*  
Sri Lanka's premier 12-hour undergrad programming contests.
- **1st Runner-up of Douthan v1.0 (of 80+ teams)** *Feb. 2021*  
12-hour competitive programming competition for university undergraduates in Sri Lanka.
- **2nd Runner-up of HackDown 2020 (of 200+ teams)** *Apr. 2020*  
Competitive programming competition.
- **2nd Runner-up of hackStat v2.0 (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.

## RELEVANT COURSEWORK

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**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

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- **Prof. Vishal M. Patel**

Department of Electrical and Computer Engineering  
Johns Hopkins University, USA  
[vpatel36@jhu.edu](mailto:vpatel36@jhu.edu)

- **Prof. Ivan Laptev**

Department of Computer Vision, MBZUAI, UAE  
[ivan.laptev@mbzuai.ac.ae](mailto:ivan.laptev@mbzuai.ac.ae)