

# Rusiru Thushara

PhD Student, Johns Hopkins University,  
Maryland, USA

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 GitHub &  Google Scholar

## EDUCATION

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### Johns Hopkins University, USA

*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.*

*Aug. 2025 - Present*

### Mohamed bin Zayed University of Artificial Intelligence, UAE

*M.Sc. in Computer Vision*

*Thesis: Towards Geometrically Consistent Novel View Synthesis Using Gaussian Splatting*

*Aug. 2023 - May. 2025*

**CGPA: 3.90/4.00**

### University of Peradeniya, Sri Lanka

*B.Sc. Engineering(Hons.) Computer Engineering*

*Nov. 2017 - Feb. 2023*

**CGPA: 3.85/4.00**

## EXPERIENCE

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### Embodied Perception Group, MBZUAI, UAE

*Visiting Researcher*

Worked on Vision-Language-Navigation and Mapping using the Unitree Go2 robot.

*June 2025 - Aug. 2025*

Advisors: Prof. Ivan Laptev, Prof. Ian Reid

### Mohamed bin Zayed University of Artificial Intelligence, UAE

*Research Intern*

Worked on 3D reconstruction of outdoor and indoor environments using the Unitree Go2 robot.

*June 2024 - Aug. 2024*

Advisor: Prof. Ivan Laptev

### Wadduwage Lab, Harvard University, USA

*Remote Research Fellow*

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.

*Jan. 2022 - July 2022*

Advisor: Dr. Dushan N. Wadduwage

## PUBLICATIONS (VIEW AT RUSIRU.US)

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### 1. 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.*

### 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. 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.*

### 4. 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.*

### 5. 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

*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

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- **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

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### 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

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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)