Yohan Abeysinghe

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EDUCATION

University of Maryland, USA **August 2025 – Present**

Ph.D - Electrical and Computer Engineering

- Developing algorithmic frameworks for multi-agent coordination in complex audio-visual landscapes, with a focus on reasoning and temporal consistency.
- Researching the theoretical foundations of VLM explainability.

University of Moratuwa, Sri Lanka **Jan 2020 – July 2024**

B.Sc (Hons) - Electronics and Telecommunication Engineering *3.80 (First Class Honours)*

Maliyadeva College, Kurunegala, Sri Lanka **Grad: Dec 2018**

GCE Advanced Level (Mathematics, Physics, Chemistry) *3As / z-score of 2.78 (Island 24)*

AWARDS

Bronze Medal: International Mathematics Olympiad (Brazil)	2017
Honourable Mention: International Mathematics Competition for University Students (Bulgaria)	2022
Bronze Medal: Asia Pacific Mathematics Olympiad (Mexico)	2018
Gold Medal: Sri Lankan Physics Olympiad	2019
International Physics Olympiad: (Israel)	2019
Honourable Mention: Asian Physics Olympiad (Australia)	2019
World Rank 163: IEEEXtream 15.0	2023
Honourable Mention: International Mathematics Olympiad	2014, 2015, 2016
Silver Medal: World Youth Mathematics Inter-Cities Competition (Thailand)	2016
Bronze Medal: World Youth Mathematics Inter-Cities Competition (Korea)	2014
Silver Medal: International Mathematics Competition (Bulgaria)	2013
Gold Medal: Sri Lankan Physics Olympiad	2019
Honourable Mention: Asia Pacific Mathematics Olympiad (Kazakhstan)	2015
Merit: International Mathematics Competition (Taipei, Taiwan)	2012
Bronze Medal: International Mathematics and Science Olympiad (Naga City, Philippines)	2011
Bronze Medal: Asia Inter-cities Teenagers Mathematics Olympiad (Kathmandu, Nepal)	2011

PUBLICATIONS

- **Yohan Abeysinghe**, Muhammad Akhtar Munir, Sanoojan Baliah, Ron Sarafian, Fahad Shahbaz Khan, Yinon Rudich, Salman Khan. "SynCast: Synergistic Neural Forecasting of Air Pollution with Stochastic Sampling." *Under review at Nature NPJ.* [ArXiv]
- Sanjoy Chowdhury, Mohamed Elmoghany, **Yohan Abeysinghe**, Junjie Fei, Sayan Nag, Salman Khan, Mohamed Elhoseiny, Dinesh Manocha. "MAGNET: A Multi-agent Framework for Finding Audio-Visual Needles by Reasoning over Multi-Video Haystacks." In *Advances in Neural Information Processing Systems (NeurIPS)* 2025. [Project Page]
- Sanoojan Baliah, **Yohan Abeysinghe**, Rusiru Thushara, Khan Muhammad, Abhinav Dhall, Karthik Nandakumar, Muhammad Haris Khan. "VFace: A Training-Free Approach for Diffusion-Based Video Face Swapping." In *Winter Conference on Applications of Computer Vision (WACV) 2026.*

RESEARCH EXPERIENCE

Mohamed bin Zayed University of Artificial Intelligence, UAE **July 2024 – July 2025**

Research Associate *Advisor: Dr. Salman Khan*

- Research on AI models for weather prediction. And VLM explainability for audio visual haystacks.

University of Sydney, Australia **Jan 2023 – Sept 2023**

Research Assistant - Internship *Advisor: Dr. Anusha Vithana*

- Research on protein folding algorithms to compare their folding pathways, with free energy landscapes of actual folding pathways of real world proteins.

OTHER SELECTED PROJECTS

Attention TCN for Motor Imagery Classification and Ear-EEG Acquisition Device **2024**

- Classifying Ear-EEG P300 signals from visual cues to identify targets vs non-targets. Using Scalograms with Grab-cad method to identify the heat maps and important frequency ranges in P300 classification process.
- Using Attention mechanism and Temporal Convolution Networks(TCN) to classify time series data
- Developing an Ear-EEG acquisition device with a generic earpice to make a new dataset.

Protein Folding: Free Energy Landscape with ML **2023**

- Implementing RoseTTAFold protein folding algorithm and taking the intermediate structures that a protein goes through while the algorithm is predicting the final structure.
- Using GROMACs Molecular Dynamics simulations to identify the folding pathways of a protein. Checking the similarities between the intermediate stages from two methods to identify how much of real world physics is learned by folding algorithms.

Head Pose Estimation Using Facial Landmark and Vision Graph Neural Networks **2024**

- Utilizing facial landmarks for head pose estimation by grouping landmarks into regions and employing tiny Deep Set layers.

AHEAD Intelligent Camera Project **Dec 2022 – Mar 2023**

- Implementing YOLO object detection and a Face recognition algorithms to run real time on a Axis P1341 camera.

Vision-based Object Recognition and Task Solving Robot **Feb 2022 – Aug 2022**

- Simulating a robot in We-bots platform, that can navigate using the input video feed from a camera. The navigation is done using using Open-CV(C++).

Project Eyeguard **Mar 2021 - Feb 2022**

- Developing a device to minimize the eye defects that can arise from long-term screen usage, by using cameras to track the eye and the blinking rates, and sending feedback to the users to take actions accordingly.

Implementing Iconic Papers In Machine Vision **Dec 2023 - Mar 2024**

- YOLO Implementation - Implementation of the object detection algorithm from scratch. **GitHub**
- Restormer Implementation - Implementation of the Restormer paper which addresses the quadratic complexity of Transformers while still capturing the long-range pixel interactions. **GitHub**
- CoCa Implementation **GitHub**

RELEVANT COURSEWORK

Computer Vision: EN4553 Machine Vision (A+), EN4583 Advances in Machine Vision (A+), EN4573 Pattern Recognition and Machine Intelligence(A+)
Mathematics: MA2023 Calculus (A+), MA2033 Linear Algebra (A), MA4013 Linear Models and Multivariate Statistics (A), MA2013 Differential Equations (A)
Miscellaneous: EN1060 Signals and Systems (A-), EN2040 Random Signals and Processes (A-)

LEADERSHIP/EXTRACURRICULARS

President: Mathematics Society, University of Moratuwa	2021
Students Representative: Department of Electronic and Telecommunication, University of Moratuwa	2022
Committee Member: Electronics Club, University of Moratuwa	2023
Sergeant at Arms: Gavel Club, University of Moratuwa	2022
Peoples Management Team: AIESEC in Colombo South	2021
Prefect: Maliyadeva College	2018

REFERENCES

Dr. Salman Khan
Associate Professor
Computer Vision Department
Mohamed bin Zayed University of Artificial Intelligence
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Dr. Anusha Withana
Senior Lecturer
School of Computer Science
University of Sydney
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