VINOJ JAYASUNDARA

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Google Scholar LinkedIn GitHub

EDUCATION

❖ **Ph.D. in Computer Science (GPA: 4.0/4.0)** **2020 - 2025**
Department of Computer Science, University of Maryland College Park.
Advisor: Prof. Abhinav Shrivastava
○ Dean's Research Fellowship (Since summer 2021).

❖ **B.Sc. Honors in Engineering (First Class Honors)** **2014 - 2018**
Department of Electronic and Telecommunication Engineering, University of Moratuwa, Sri Lanka.
○ President's Award for Scientific Research

❖ **Bachelor of Information Technology (First Class Honors)** **2011 – 2017**
Faculty of Information Technology, University of Moratuwa, Sri Lanka.

❖ **Bachelor of Laws (Second Class Honours)** **2012 - 2016**
University of London, United Kingdom.

PUBLICATIONS

Google Scholar Profile (Citations: 392, h-index: 7 as of June 2023)

CONFERENCE PAPERS

❖ **Jayasundara, V.**, Agrawal, A., Heron, N., Shrivastava, A. and Davis, LS., FlexNeRF: Photorealistic Free-viewpoint Rendering of Moving Humans from Sparse Views. *Proceedings of the IEEE conference on computer vision and pattern recognition (**CVPR**)*, 2023. *[Paper, Project Page]*

❖ **Jayasundara, V.**, Roy, D. and Fernando, B., FlowCaps: Optical Flow Estimation with Capsule Networks For Action Recognition. *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**)*, 2021. (***Oral***). *[Paper, Presentation]*

❖ Gupta, K., Somepalli, G., Gupta, A., **Jayasundara, V.**, Zwicker, M. and Shrivastava, A., PatchGame: Learning to Signal Mid-level Patches in Referential Games. *Advances in Neural Information Processing Systems (**NeurIPS**)*, 2021. *[Paper]*

❖ Rajasegaran, J., **Jayasundara, V.**, Jayasekara, S., Jayasekara, H., Seneviratne, S. and Rodrigo, R., DeepCaps: Going Deeper with Capsule Networks. *Proceedings of the IEEE conference on computer vision and pattern recognition (**CVPR**)*, 2019. (***Oral***). *[Paper, Presentation, Poster, Code]*

❖ **Jayasundara, V.**, Jayasekara, S., Jayasekara, H., Rajasegaran, J., Seneviratne, S. and Rodrigo, R., TextCaps: Handwritten Character Recognition with Very Small Datasets. *Winter Conference on Applications of Computer Vision (**WACV**)*, 2019. (***Oral***). *[Paper, Presentation, Poster, Code]*

❖ **Jayasundara, V.**, Bui, N., Jiang, L. and Lo, D., TreeCaps: Tree-Structured Capsule Networks for Program Source Code Processing. *Advances in Neural Information Processing Systems, ML for Systems Workshop (**NeurIPS Workshops**)*, 2019. *[Paper, Presentation, Code]*

❖ Jayasekara, H., **Jayasundara, V.**, Jayasekara, S., Rajasegaran, J., Seneviratne, S. and Rodrigo, R., TimeCaps: Learning from Time Series Data with Capsule Networks. *Advances in Neural Information Processing Systems, Learning Meaningful Representations of Life Workshop (**NeurIPS Workshops**)*, 2019. (***Oral***). *[Paper]*

- Gao, Z., **Jayasundara, V.**, Jiang, L., Xia, X., Lo, D. and Grundy, J., SmartEmbed: A Tool for Clone and Bug Detection in Smart Contracts through Structural Code Embedding. *IEEE International Conference on Software Maintenance and Evolution (**ICSME**)*, 2019. *[Paper, Code]*

- Ramasinghe, S., Rajasegaran, J., **Jayasundara, V.**, Ranasinghe, K., Rodrigo, R. and Pasqual, A., Micro Actions and Deep Static Features for Activity Recognition. *IEEE Digital Image Computing: Techniques and Applications (**DICTA**)*, 2017. (***Oral***). *[Paper, Presentation, Poster]*

JOURNAL ARTICLES

- Denipitiyage, D., **Jayasundara, V.**, Rodrigo, R. and Edussooriya, C., PointCaps: Raw Point Cloud Processing using Capsule Networks with Euclidean Distance Routing. *Journal of Visual Communication and Image Representation (**JVCI**)*, 2022. *[Paper]*

- **Jayasundara, V.**, Jayasekara, H. and Samarasekara, T., Device-Free User Authentication, Activity Classification and Tracking using Passive Wi-Fi Sensing: A Deep Learning Based Approach. *IEEE Sensors Journal (**Sensors**)*, 2020. (*Impact Factor: 3.076*) *[Paper]*

- Ramasinghe, S., Rajasegaran, J., **Jayasundara, V.**, Ranasinghe, K., Rodrigo, R. and Pasqual, A.A., Combined Static and Motion Features for Deep-Networks Based Activity Recognition in Videos. *IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**)*, 2017. (*Impact Factor: 4.046*) *[Paper]*

RESEARCH AND PROFESSIONAL EXPERIENCE

LinkedIn Profile

- **Computer Vision Research Intern (Full time)** **May 2023 - To Date**
  Apple, Cupertino, California, US.

  Multi-modal multi-task language-grounded 3D/4D scene reconstruction when each modality only has partial information regarding the scene. *Supervisor: Dr. Eshan Verma*

- **Applied Scientist Intern (Full time)** **May 2022 - Nov 2022**
  Amazon, New York, US.

  NeRF based novel-view synthesis with a focus on photorealistic rendering and reposing of moving subjects wearing complex clothing and accessories when only sparse views are available. *Supervisor: Prof. Larry S. Davis*

- **Research Engineer (Full time)** **Oct 2019 - Dec 2020**
  Agency for Science, Technology and Research (A*STAR), Singapore.

  Learning to anticipate human actions that happen in the next one to five seconds using self-regularized future content generation. *Supervisor: Dr. Basura Fernando*

- **Senior Software Engineer/Project Lead (Part time remote)** **Sep 2018 - Dec 2020**
  Reservoir Rock Technologies, Perth, Australia.

  Object detection, recognition and scene understanding for self-driving vehicles and underground imaging.

- **Research Engineer (Full time)** **Feb 2019 - Sep 2019**
  School of Information Systems, Singapore Management University, Singapore.

  Tree-structured convolutional and capsule networks for code analysis and related NLP tasks.

- **Software Engineer (Part time)** **Jan 2018 - Dec 2018**
  Soft Vision Technologies (Pvt) Ltd, Colombo, Sri Lanka.

- **Research Assistant (Full time)** **Jul 2017 - Dec 2017**
  LiveLabs Urban Lifestyle Innovation Lab, Singapore Management University, Singapore.

SKILLS

Github Page

- Excellent programming skills:
  - Fluent in Python, Java, MATLAB
  - DL/ML frameworks: PyTorch, TensorFlow, Keras
  - Others: PHP, HTML, CSS, JavaScript, MySQL, Android Studio, GNURadio, Arduino
- Strong independent research skills, technical and creative writing skills, communication skills, interpersonal skills, leadership skills and the ability to deliver under a tight schedule.

LIST OF ONGOING PROJECTS

- Predicting a continuous neural scene representation for dynamic state-changing scenes (Eg: an apple being cut).
- Topology-aware photorealistic modeling of humans with complex clothing and accessories in dynamic scenes.
- Rendering complex 3D scenes from a single view with diffusion models.
- A PyTorch library for differentiable approximation of generic non-differentiable functions for deep learning tasks.

TEACHING EXPERIENCE AND PROFESSIONAL SERVICE

- Reviewer (selected venues): NeurIPS'23, CVPR'23, BMVC'20-21, IEEE TIE journal (*IF:* 7.503).
- ScholarX Mentor in AI: Mentored 6 undergraduate students under the ScholarX program organized by the Sustainable Education Foundation (SEF) for 2021.
- Teaching Assistant:
  - CMSC472: Introduction to Deep Learning (UMD)
  - CMSC250: Discrete Structures (UMD)
- Mentored undergraduate students and interns:
  - Gabriel Ng, Chuqi Qin: Action Recognition (2020)
  - Uvindu Perera: Open Set Recognition (2019/2020)
  - Kalana Abeywardena, Shechem Sumanthiran: Capsule Networks (2018)

SELECTED ACHIEVEMENTS, AWARDS AND PROFESSIONAL AFFILIATIONS

- **President's Award for Scientific Research** **2019**
  Highest honours for researchers in Sri Lanka.
- **Sujatha Guruge Scholarship** **2016**
  Best performance in the first semester of undergraduate study among all state universities, Sri Lanka.
- **First runner-up : International Robotics Demonstration Contest** **2016**
  Organized by the IEEE Industry Applications Society, held in Cincinnati, USA.
- **First runner-up : International Robotics Challenge** **2016**
  Organized by the Indian Institute of Technology (IIT), Bombay, India.
- **Second Runner-up : Sri Lanka Robotics Competition** **2016**
  Organized by the University of Moratuwa, Sri Lanka.
- **Alan Turing award for Mathematics** **2012**
  Turing Day 2012 organized by the Sri Lanka Institute of Information Technology (SLIIT), Sri Lanka.
- **Represented Sri Lanka**
  IGNOU-UNESCO Science Olympiad 2010, obtaining an overall score of 91.8. **2010**
  International Mathematics and Science Olympiad 2005 held in Jakarta, Indonesia. **2005**