

KANCHANA NISAL RANASINGHE

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EDUCATION

Stony Brook University, NY, USA

Aug 2021 - Present

PhD in Computer Science

University of Moratuwa, Sri Lanka

Dec 2015 - Jan 2020

BSc in Engineering; GPA: 3.95/4.20; Awarded Most Outstanding Graduated of the Year

EXPERIENCE

MBZUAI, Abu Dhabi, UAE - Research Assistant

Nov 2020 - Aug 2021

- Exploring vision transformer architectures and contrastive losses for self-supervised video representation learning
- Developing novel generative modelling methodology for multi-modal output spaces
- Experimentation on self-distillation, domain generalization, and adversarial robustness of vision transformers
- Constructing novel loss functions on embedding spaces for generalizable representation learning

VeracityAI, Colombo, Sri Lanka

Feb 2020 - Oct 2020

Machine Learning Engineer

- Leading a team of three associate data scientists for research and development of vehicle damage detection system
- Research on unsupervised clustering and distance metric computation for learning vehicle damage distributions
- Building active learning pipeline analysing model confidence extraction methods for optimal annotation of data
- Anomaly detection and attribute identification from spectral data samples for automating tea quality assurance

Associate Data Scientist

Jan 2019 - Jan 2020

- Developing image segmentation based computer vision component of vehicle damage estimation system for insurance purposes: product was developed beyond MVP stage with successful real-world testing

FiveAI, Cambridge, UK - Research Intern

June 2018 - Dec 2018

- Research on 3D orientation estimation in autonomous vehicle video feeds leading to improvements handling occluded and truncated objects that was deployed to the vehicle software stack
- Establishing value of synthetic data for boosting real-world performance in tasks like orientation estimation
- Research on neural network verification and exploration through methods like GradCam, Saliency Maps, and TCAV

University of Moratuwa, Sri Lanka - Undergraduate Researcher

July 2016 - Aug 2017

- Research on optimal methods of static and motion feature fusion for deep learning based action recognition in videos
- Analysis of various feature fusion techniques, exploring mathematical validity of selected approaches, and implementing a recurrent neural network (LSTM) for capturing temporal variation of fused features

PUBLICATIONS

Muzammal Naseer*, **Kanchana Ranasinghe***, Salman Khan, Fahad Shahbaz Khan, Fatih Porikli, **On Improving Adversarial Transferability of Vision Transformers.**

Muzammal Naseer, **Kanchana Ranasinghe**, Salman Khan, Munawar Hayat, Fahad Shahbaz Khan, Ming-Hsuan Yang, **Intriguing Properties of Vision Transformers** (accepted to NeurIPS, 2021).

Kanchana Ranasinghe, Muzammal Naseer, Munawar Hayat, Salman Khan, Fahad Shahbaz Khan, **Orthogonal Projection Loss**, International Conference on Computer Vision, 2021.

S. Ramasinghe, **K Ranasinghe**, Salman Khan, Nick Barnes, and Stephen Gould, **Conditional Generative Modeling via Learning the Latent Space**, International Conference on Learning Representations, 2021.

S. Jayasumana, **K. Ranasinghe**, M. Jayawardhana, S. Liyanaarachchi and H. Ranasinghe, **Bipartite Conditional Random Fields for Panoptic Segmentation**, Proceedings of the British Machine Vision Conference, 2020.

S. Ramasinghe, J. Rajasegaran, V. Jayasundara, **K. Ranasinghe**, R. Rodrigo and A. A. Pasqual, **Combined Static and Motion Features for Deep-Networks Based Activity Recognition in Videos**, in IEEE Transactions on Circuits and Systems for Video Technology, vol. 29, no. 9, pp. 2693-2707, Sept. 2019.

S. Ramasinghe, J. Rajasegaran, V. Jayasundara, **K. Ranasinghe**, R. Rodrigo and A. Pasqual, **Micro Actions and Deep Static Features for Activity Recognition**, DICTA, Sydney, Australia, 2017.

ADDITIONAL RESEARCH PROJECTS

Self Supervised Learning

Mar 2020 - Oct 2020

- Research on state-of-the-art conditional generative modeling approaches, their performance in multi-modal spaces, and leveraging generative models for self-supervised learning
- Experimentation with a range of state-of-the-art generative adversarial networks (GANs) on standard image datasets and evaluating performance in terms of accuracy, speed, and computational overhead

Undergraduate Research Project

Jan 2019 - Jan 2020

- Research on combining Siamese Trackers and recurrent neural networks (LSTM) to simultaneously exploit appearance and spatial information for multi-object tracking, developing unique approach for occlusion aware object tracking, and analyzing effectiveness of BEV space projections for spatial tracking
- Research on panoptic segmentation using conditional random fields, development of novel information fusion layer achieving state-of-the-art performance

Plant Disease Detection

June 2017 - June 2018

- Developing of plant-leaf based disease detection system from multi-spectral image feeds (NIR/RGB spectra) and implementing transfer learning based training of CNNs on small datasets of domain-specific images
- Project deployed using mobile app with edge inference and recognized as a Top Initiative at National Tech Awards

SELECTED AWARDS

Most Outstanding Graduated of the Year - University of Moratuwa, Sri Lanka	2020
Mahapola Merit Scholarship - Ranked 13th in Sri Lanka at GCE Advanced Level Examination	2014
Participation/ Ranked 296th in world - International Mathematical Olympiad (IMO), Columbia	2013
Bronze Medalist - International Mathematics Competition, South Korea	2010
International Representation / National Champion - IGNOU UNESCO Science Olympiad, India	2011

PROFESSIONAL ACTIVITIES

British Machine Vision Conference - Peer Reviewer	2020, 2021
IEEE Transactions on Circuits and Systems for Video Technology - Peer Reviewer	2017, 2018

SKILLS

Languages: Python (proficient), MATLAB, C++ (novice)	Frameworks: Tensorflow, PyTorch
Experience & Interests: Computer Vision, Machine Learning, Deep Learning	

HACKATHON EXPERIENCE

Finalists - Presidential Hackathon organized by the Government of Taiwan	Taiwan, 2019
Asia-Pacific Runners-Up - Innovate FPGA organized by Intel and Terasic	International, 2018
Champions & Best Data Scientist - Datathon organized by Axiata	Colombo, 2019
Champions - CodeSprint 3.0 organized by IdeaMart & IIT	Colombo, 2018

VOLUNTEER EXPERIENCE / LEADERSHIP

Captain - University of Moratuwa Debating Team	2016/2017
President - OREPA Student Chapter	2019
Secretary - Mathematics Society - University of Moratuwa	2017/2018
Executive Committee - Sri Lanka Model United Nations	2015
President - Gavel Club of high school (affiliated to Toastmasters International)	2012/2013
Community Service Director - Interact Club of high school	2013/2014
Player - Football Team of high school	2010/2011/2012
Scouting - high school	2009/2010/2011/2012
Cast Member - Theatre Circle of high school	2012/2013