

# KANCHANA NISAL RANASINGHE

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## EDUCATION

**University of Moratuwa, Sri Lanka** **CGPA: 3.95** (First Class Honours) Dec 2015 - Jan 2020  
B.Sc. Engineering - *Awarded Most Outstanding Graduand of the Year* Dean's List: Semester 1,2,3,4,6,7,8

**Royal College, Colombo, Sri Lanka** Grad: Dec 2014  
GCE Advanced Level (Mathematics, Physics, Chemistry, General English) 4As / 13th in country / z-score of 2.83  
(country-wide university entrance examination taken by over 100,000 students annually)

## EXPERIENCE

**MBZUAI, Abu Dhabi, UAE**  
*Research Assistant* (Nov 2020 - Present)

- Working as a research assistant for the computer vision department in the university research division.
- Research on Few Shot Learning with focus on leveraging self-supervised methods to improve few-shot object detection.

**VeracityAI, Colombo, Sri Lanka**  
*Machine Learning Engineer* (Feb 2020 - Oct 2020)

- Leading a team of 3 associate data scientists for research and development of vehicle damage detection system
- Adopting algorithms similar to Mask R-CNN, SSD and EfficientDet with use-case specific data augmentation methods, hyper-parameter tuning, and real world testing based dataset expansion
- Building active learning pipeline analysing model confidence extraction methods for optimal annotation of data

*Associate Data Scientist* (Jan 2019 - Jan 2020)

- Developing computer vision component of vehicle damage estimation system for insurance purposes: product was developed beyond MVP stage with real-world testing
- Research on LIDAR based examining of buildings and structures for maintenance and insurance purposes

**FiveAI, Cambridge, UK**  
*Research Intern* (June 2018 - Dec 2018)

- Research on 3D orientation estimation of objects in 2D image feeds and development of a novel algorithm with superior performance deployed to autonomous vehicle software stack
- Exploring and integrating synthetic data to training datasets and verifying improvements for a range of computer vision tasks with augmented datasets
- Research on neural network verification and exploration through methods like GradCam, Saliency Maps, and TCAV.

**Cerebrum, Moratuwa, Sri Lanka - Researcher** (Jan 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

## PUBLICATIONS

S. Ramasinghe, **K. Ranasinghe**, Salman Khan, Nick Barnes, and Stephen Gould, **Conditional Generative Modeling in Continuous Multimodal Spaces** (submitted for ICLR 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**, 2017 International Conference on Digital Image Computing: Techniques and Applications (DICTA), Sydney, Australia, 2017, pp. 1-8.

**K. Ranasinghe**, M. Jayawardhana, S. Liyanaarachchi and H. Ranasinghe, **Extending Multi-Object Tracking systems to better exploit appearance and 3D information**, 2019 arxiv preprint.

## RESEARCH PROJECTS

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### Few Shot Detection

(June 2020 - Present)

- Research and experimentation with state-of-the-art methods for few shot learning in the domain of object detection
- Analysis on transfer learning strengths of various feature extraction architectures.

### Self Supervised Learning

(Mar 2019 - June 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

## SELECTED AWARDS

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

## PROFESSIONAL ACTIVITIES

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|---|------------|
| <b>British Machine Vision Conference</b> - Peer Reviewer                              | 2020       |
| <b>IEEE Transactions on Circuits and Systems for Video Technology</b> - Peer Reviewer | 2017, 2018 |

## SKILLS

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|--|-----------------------------------|
| <b>Languages:</b> Python (proficient), MATLAB, C++, Lua (novice)                 | <b>Tools:</b> Tensorflow, PyTorch |
| <b>Experience &amp; Interests:</b> Computer Vision, Machine Learning, Algorithms |                                   |

## HACKATHON EXPERIENCE

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

## VOLUNTEER EXPERIENCE / LEADERSHIP

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