

# KANCHANA NISAL RANASINGHE

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## EXPERIENCE / PROJECTS

**SAKS, Colombo, Sri Lanka** - Associate Data Scientist (part-time) (Jan 2019 - Jan 2020)

- Research on LIDAR based examining of buildings and structures for maintenance and insurance purposes
- Developing computer vision component of vehicle damage estimation system for insurance purposes: product was developed beyond MVP stage with real-world testing
- Setting up deep neural networks for pixel-wise classification of vehicle parts and damage on company datasets
- Implementation of quantized neural network architectures efficient for inference on edge devices

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

- Developing a model for orientation estimation of objects in 2D image feeds and deploying to vehicle software stack
- Training object detection models on large datasets while optimizing data-feeding and evaluation pipelines
- Exploring and integrating synthetic data to training datasets and verifying improvements for certain tasks with augmented datasets
- Working on neural network verification and exploration through methods like GradCam, Saliency Maps, and TCAV.

**Cerebrum AI Solutions, Moratuwa, Sri Lanka** - Researcher (part-time) (Jan 2017 - June 2018)

- Developing of plant-leaf based disease detection system from multi-spectral image feeds (NIR/RGB spectra)
- Transfer learning based training of CNNs on small datasets of domain-specific images
- Project recognised as a Top Initiative at National Tech Awards

**University of Moratuwa, Sri Lanka** - Undergraduate Research (July 2016 - Jan 2020)

- Action Recognition in Videos through Deep Learning focusing on analysing mathematical validity of methods for fusing feature vectors, and implementing Recurrent Neural Networks (LSTM) for temporal analysis
- Combining Siamese Trackers and LSTM networks to simultaneously exploit appearance and spatial information for multi-object tracking, and evaluating effectiveness of BEV space projections for spatial tracking
- Developing of novel approach for panoptic segmentation using conditional random fields

## EDUCATION

**University of Moratuwa, Sri Lanka** Cumulative GPA: 3.92 Dec 2015 - Jan 2020  
B.Sc. Engineering (Electronics and Telecommunications) Dean's List: Semester 1,2,3,4,6,7

Linear Algebra (A)	Signals and Systems (A+)	Random Signals and Processes (A+)
Data Structures and Algorithms (A)	Differential Equations (A+)	Graph Theory (A+)
Fundamentals of Image Processing (A+)	Applied Statistics (A+)	Machine Vision (A+)

**Royal College, Colombo, Sri Lanka** Grad: Dec 2014  
GCE Advanced Level (Mathematics, Physics, Chemistry) 3As / 13th in country / z-score of 2.83  
(country-wide university entrance examination taken by 270,000 students annually)

### Other Courses

Deep Learning: 5-course specialization (on Coursera)	(Certificate earned - Apr 2018)
Intermediate C++ (on EdX)	(Certificate earned - Oct 2017)
Machine Learning (on Coursera)	(Certificate earned - Aug 2016)

## PUBLICATIONS

S. Jayasumana, **K. Ranasinghe**, M. Jayawardhana, S. Liyanaarachchi and H. Ranasinghe, **Bipartite Conditional Random Fields for Panoptic Segmentation**, 2019 arxiv preprint (submitted for conference).

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

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.

## AWARDS

<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>Participation/National Champion</b> - IGNOU UNESCO Science Olympiad, India	2011

## SKILLS

<b>Languages:</b> Python (proficient), MATLAB, C++, Lua (novice)	<b>Tools:</b> Tensorflow, Torch, ROS
<b>Experience &amp; Interest:</b> Computer Vision, Machine Learning, Deep Learning	

## VOLUNTEER EXPERIENCE / LEADERSHIP

<b>Captain - University of Moratuwa Debating Team</b>	2016/2017
Reviving and establishing a debating society and team at the university. Training of university debating teams comprising of around 20 debaters. Team emerged 1 <sup>st</sup> runners-up at national level inter-university tournament.	
<b>President - OREPA Student Chapter</b>	2019
Leading the Student Chapter of a volunteer past-pupils association group comprising of engineers. Coordinating over 10 annual projects under 5 different avenues by leading a executive committee of 12 and a club membership exceeding 200.	
<b>Secretary - Mathematics Society - University of Moratuwa</b>	2017/2018
Leading the university mathematics society comprising of over 50 members in organising weekly forums, intra-campus competitions, and activities for freshers. Initiated a program to hold monthly talks by notable researchers in fields closely linked to mathematics and engineering.	
<b>Executive Committee - Sri Lanka Model United Nations</b>	2015
President of a sub-committee. Responsible for organising multiple awareness sessions around the country, coordinating with partners like UNPD and UNFPA, and organising an international conference (Asia's largest student led conference) with over 1000 participants.	
<b>President - Gavel Club of Royal College</b> (affiliated to Toastmasters International)	2012/2013
Responsible for leading executive committee of 7 members, and club of 60 members. Led the organising of a regional competition with over 800 high school participants. Organised multiple workshops for student skills development.	
<b>Director - Interact Club of Royal College</b>	2012/2013/2014
Giving leadership to a club of over 200 high school students. Organising of a wide range of community service projects targeting school students, rural regions, and selected poor families. Also led three teams that were organising large scale fund raisers: a talent show, a theatre production and a rugby tournament.	
<b>Player - Football Team of Royal College</b>	2010/2011/2012
Represented the high-school football team at multiple regional and national level tournaments. Member of the champion team at the annual Royal Thomian Football encounter in 2011.	
<b>Scouting - Royal College</b>	2009/2010/2011/2012
Patrol Leader, Troop Leader, and Instructor (for one troop comprising of 3 patrols with 6-7 students in each patrol) for scouting at high school. Guiding and monitoring continuous development and weekly activities for all all students of the troop. Also involved in organising multiple outstation year-end camps and various scouting events at school.	
<b>Cast Member - Theatre Circle of Royal College</b>	2012/2013
Acting in multiple theatrical performances and public productions at high school. Emerging champions at multiple inter-school theatre contests.	

## HACKATHON EXPERIENCE

<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
<b>Runners-Up</b> - 4iR Hackathon organized by SLASSCOM	Colombo, 2018
<b>Runners-Up</b> - LetMeHack organized by Sabaragamu University	Belihuloya, 2018
<b>Runners-Up</b> - Techno Hackathon organized by IESL	Colombo, 2017
<b>Runners-Up</b> - SLTA Hackathon organized by SLTA	Colombo, 2017