

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 Graduated 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)

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)

EXPERIENCE

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

- 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

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
- Research on state-of-the-art deep learning based instance and semantic segmentation algorithms, implementation and fine-tuning of selected methods using case-specific datasets, and analysis on most suitable approaches
- Implementation of quantized neural network architectures efficient for real-time inference on edge devices

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

- 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 AI Solutions, 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**, et al., **Conditional Generative Modeling in Continuous Multimodal Spaces** (submitted for NIPS 2020)

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

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

Action Recognition in Videos (July 2016 - Jan 2017)

- Research on optimal methods of static and motion feature fusion for deep learning based action recognition in videos
- Literary review on state-of-the-art methods, research on various feature fusion techniques and analysing mathematical validity in fusing feature vectors, and implementing recurrent neural networks (LSTM) for capturing temporal variation of fused features

SELECTED AWARDS

Most Outstanding Graduand of the Year - University of Moratuwa, Sri Lanka	2020
Mahapola Merit Award - Ranked 13th in Sri Lanka at GCE Advanced Level	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
IEEE Transactions on Circuits and Systems for Video Technology - Peer Reviewer	2017, 2018

SKILLS

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

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

- Captain - University of Moratuwa Debating Team** 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 1st runners-up at national level inter-university tournament.
- President - OREPA Student Chapter** 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 an executive committee of 12 and a club membership exceeding 200.
- Secretary - Mathematics Society - University of Moratuwa** 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.
- Executive Committee - Sri Lanka Model United Nations** 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.
- President - Gavel Club of Royal College** (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.
- Director - Interact Club of Royal College** 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.
- Player - Football Team of Royal College** 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.
- Scouting - Royal College** 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 students of the troop. Also involved in organising multiple outstation year-end camps and various scouting events at school.
- Cast Member - Theatre Circle of Royal College** 2012/2013
Acting in multiple theatrical performances and public productions at high school. Emerging champions at multiple inter-school theatre contests.