Kanchana Ranasinghe

kranasinghe@cs.stonybrook.edu | http://kahnchana.github.io

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; Awarded Most Outstanding Graduand of the Year
Senior Thesis Title: "Realtime Multi-Object Tracking and Pixelwise Segmentation"

Research Experience

Google Research, NYC, USA - *Student Researcher* March 2024 - Dec 2024
- Continuous-space conditional random field (CRF) formulation for modeling natural image distribution
- Latent space CRF operation and integration with diffusion models for efficient text-to-image generation

Meta AI Research, NYC, USA - *Research Scientist Intern* May 2023 - Dec 2023
- Spatial reasoning in multi-modal large language models (CVPR '24)
- Localization awareness in video-language models

Apple MLR, Cupertino, USA - *Machine Learning Research Intern* May 2022 - Sep 2022
- Multi-modal self-supervised representation learning (ICCV '23)
- Interpretability and robustness of vision language models

MBZUAI, Abu Dhabi, UAE - *Research Assistant* Nov 2020 - Aug 2021
- Representation learning: contrastive losses, self-supervised objectives (ICCV '21)
- Interpretability, robustness, and adversarial attacks for vision transformers (NeurIPS '21, ICLR '22)
- Generative modelling for multi-modal output spaces (ICLR '21)

Wenn ASA, Stavanger, Norway - *Machine Learning Engineer (remote)* Jan 2019 - Oct 2020
- Leading team of three associate data scientists for vehicle damage detection project
- Focus on efficient mobile implementations, instance segmentation models, and active learning

FiveAI, Cambridge, UK - *Research Intern* June 2018 - Dec 2018
- Perception team of self-driving startup
- 3D orientation estimation: improve occluded object handling in videos with synthetic data

Selected Awards

Outstanding Demo Award at CVPR 2023
Burgert, Ranasinghe, Li, Ryoo, *"Diffusion Illusions: Hiding Images in Plain Sight"*

Most Outstanding Graduand of the Year
Class of 2020 at University of Moratuwa, Sri Lanka

Selected Publications

LatentCRF: Continuous CRF for Efficient Latent Diffusion *under review*
K Ranasinghe, S Jayasumana, A Veit, A Chakrabarti, D Glasner, M S Ryoo, S Ramalingam, S Kumar

Learning to Localize Objects Improves Spatial Reasoning in Visual-LLMs CVPR, 2024
K Ranasinghe, S N Shukla, O Poursaeed, M S Ryoo, T Y Lin

Language-based Action Concept Spaces Improve Video SSL NeurIPS, 2023
K Ranasinghe, M S Ryoo

Perceptual Grouping in Contrastive Vision-Language Models ICCV, 2023
K Ranasinghe, B McKinzie, S Ravi, Y Yang, A Toshev, J Shlens

Self-supervised Video Transformers CVPR, 2022 (oral)
K Ranasinghe, M Naseer, S Khan, F Khan, M S Ryoo

Intriguing Properties of Vision Transformers NeurIPS, 2021 (spotlight)
M Naseer, K Ranasinghe, S Khan, M Hayat, F Khan, M Yang
(*listed among top 15 most cited papers at NeurIPS 2021* - link)

Orthogonal Projection Loss ICCV, 2021
K Ranasinghe, M Naseer, M Hayat, S Khan, F Khan

Other Publications

Unsupervised Domain Adaptive Segmentation using Domain-Agnostic Text ECCV, 2024
C Mata, K Ranasinghe, M S Ryoo

LLaRA: Supercharging Robot Learning Data for Vision-Language Policy CoRL workshop, 2024
X Li, C Mata, J Park, K Kahatapitiya, Y Jang, J Shang, K Ranasinghe, R Burgert, M Cai, Y Lee, M S Ryoo

Hierarchical Text-to-Vision Self Supervised Alignment for Improved Histopathology Representation Learning MICCAI 2024
H Watawana, K Ranasinghe, T Mahmood, M Naseer, S Khan, F S Khan

Understanding Long Videos with Multimodal Language Models *under review*
K Ranasinghe, X Li, K Kahatapitiya, M S Ryoo

Too Many Frames, not all Useful: Efficient Strategies for Long-Form Video QA
J Park, K Ranasinghe, K Kahatapitiya, W Ryoo, D Kim, M S Ryoo NeurIPS workshop, 2024

Language Repository for Long Video Understanding NeurIPS workshop, 2024
K Kahatapitiya, K Ranasinghe, J Park, M S Ryoo

Diffusion Illusions: Hiding Images in Plain Sight SIGGRAPH, 2024
R Burgert, X Li, A Leite, K Ranasinghe, M Ryoo

Peekaboo: Text to Image Diffusion Models are Zero-Shot Segmentors CVPR workshop, 2023
R Burgert, K Ranasinghe, X Li, M S Ryoo

On Improving Adversarial Transferability of Vision Transformers ICLR, 2022 (spotlight)
M Naseer, K Ranasinghe, S Khan, F Khan, F Porikli

Conditional Generative Modeling via Learning the Latent Space ICLR, 2021
S Ramasinghe, K Ranasinghe, S Khan, N Barnes, S Gould

Bipartite Conditional Random Fields for Panoptic Segmentation BMVC, 2020 (oral)
S. Jayasumana, K Ranasinghe, M. Jayawardhana, S. Liyanaarachchi and H. Ranasinghe

Combined Static & Motion Features for Deep-Networks Based Activity Recognition in Videos, S. Ramasinghe, J. Rajasegaran, V. Jayasundara, K Ranasinghe, R. Rodrigo and A. A. Pasqual, IEEE Transactions on Circuits and Systems for Video Technology, vol. 29, Sept. 2019.

Micro Actions and Deep Static Features for Activity Recognition, S. Ramasinghe, J. Rajasegaran, V. Jayasundara, K. Ranasinghe, R. Rodrigo and A. Pasqual, International Conference on Digital Image Computing: Techniques and Applications (DICTA), Sydney, Australia, 2017.

Patents

Kanchana Ranasinghe, Muhammad Muzammal Naseer, Salman Khan, Fahad Khan, **"System and Method for Self-supervised Video Transformer."** US Patent US20240169692A1 filed on 11/21/2022.

Invited Talks

"MVU - an LLM-based framework for solving Long Video Question Answering benchmarks", presented (remotely) at Multimodal Weekly organized by Twelve Labs (Aug 2024).

"Learning to Localize Objects Improves Spatial Reasoning in Visual-LLMs", presented at NYC Vision RG, Google Research, NYC (Apr 2024).

"Perceptual Grouping in Contrastive Vision-Language Models", presented at Electronics and Telecommunications Department, University of Moratuwa, Sri Lanka (Jan 2024).

"Perceptual Grouping in Contrastive Vision-Language Models", presented (remotely) at Computer Vision Talks series, ETS Montreal (Oct 2023).

Teaching

Stony Brook University, NY, USA

- Teaching assistant for CSE 101 course on Introduction to Digital Intelligence
- Teaching assistant for CSE 215 course on Foundations of Computer Science course
- Supporting for graduate level computer vision seminar CSE 656

University of Moratuwa, Sri Lanka

- Teaching assistant for undergraduate course on Introduction to Computer Vision
- Supporting for undergraduate level computer vision seminar

Service

Reviewing

- Conference reviewer: CVPR, ICCV, ECCV, NeurIPS, ICLR, ICML, ICRA 2022 - present
- Journal reviewer: IJCV, TCSVT 2021 - present

Mentoring

- Mentor for undergraduate computer science students at Women in Engineering in Sri Lanka 2023
- Mentor for machine learning competition teams at University of Moratuwa, Sri Lanka 2023
- Mentor undergraduates from University of Moratuwa, Sri Lanka in computer vision research projects and academic writing 2023 - present

Other Awards

Graduate Fellowship - Stony Brook University, NY, USA 2022

National Merit Scholarship - Ranked 13th (2.83 z-score) in Sri Lanka at GCE A/L Examination 2014