

RESEARCH FOCUS

Safe and reliable vision and multimodal models for medical imaging and beyond. Focused on self-supervised pre-training and parameter-efficient post-training for improving out-of-distribution detection and robustness under distribution shifts. Experienced in large-scale data curation, distributed self-supervised pretraining, and efficient fine-tuning for deployment.

EDUCATION

Rochester Institute of Technology, Ph.D. Imaging Science 2015–2022

Thesis: Learning representations in the hyperspectral domain in aerial imagery

Rochester Institute of Technology, M.S. Electrical Engineering 2013–2015

EXPERIENCE

Memorial Sloan Kettering Cancer Center, *Research Fellow* August 2022 – Present

- Pretrained vision and multimodal models on curated research and clinical datasets, and designed robustness benchmarks for OOD detection and distribution shifts.
- Developed segmentation models across multiple cancer imaging (CT/MRI/PET/Language) with real-world multi-hospital data; collaborated closely with radiation oncologists and medical physicists for shipping into clinical workflows.
- Explored post-training methods (parameter-efficient LoRA/DoRA and frozen feature augmentation) for semantic segmentation, enabling efficient fine-tuning (reduced GPU hours by 30%) of pretrained models with improved OOD generalization.
- Students mentored: [Jorge T Gomez](#), [Nishant Nadkarni](#), [Shiqin Tan](#)

Rochester Institute of Technology, *Graduate Research Assistant* May 2016 - August 2022

- Designed self-supervised and semi-supervised frameworks for hyperspectral/remote sensing imagery, implementing foundation model approaches for improved gains ($> 10\%$).
- Built scalable dataset curation pipelines for hyperspectral image and video analysis (largest $\geq 4\text{TB}$).
- Students mentored: [Henry Ye](#), [Varun Mondaiyka](#), [Parikshit Shembekar](#)

SRI International, *Research Intern* Summer 2018

- Designed continual self-supervised approaches for object counting in aerial imagery with efficient data labeling.
- Adapted Faster R-CNN for occlusion-aware infrared object detection under low-data regimes.

Conduent Labs, *Software Research Intern* Summer 2017

- Developed GAN-based data augmentation for vehicle occupancy estimation at toll booths.

SELECTED PUBLICATIONS

1. **A Rangnekar**, H Veeraraghavan. Random forest-based out-of-distribution detection for robust lung cancer segmentation. [Under review] [\[Link\]](#)
2. **A Rangnekar**, N Mankuzhy, J Willmann, C Choi, A Wu, M Thor, A Rimner, H Veeraraghavan. Pretrained hybrid transformer for generalizable cardiac substructures segmentation from contrast and non-contrast CTs in lung and breast cancers. [Under review] [\[Link\]](#)
3. M Kayser, M Gridnev, W Wang, M Bain, **A Rangnekar**, A Chatterjee, A Petrov, H Veeraraghavan, N Swinburne. brat: Aligned multi-view embeddings for brain MRI analysis. [\[Link\]](#)
Winter Conference on Applications of Computer Vision (WACV), 2026.
4. **A Rangnekar**, N Nadkarni, J Jiang, H Veeraraghavan. Quantifying uncertainty in lung cancer segmentation with foundation models applied to mixed-domain datasets. [\[Link\]](#)
SPIE Conference on Medical Imaging, 2025.

5. J Jiang, **A Rangnekar**, H Veeraraghavan. Self-supervised learning improves robustness of deep learning lung tumor segmentation models to CT imaging differences. [\[Link\]](#)
Journal of Medical Physics, 2025.
6. J Jiang, **A Rangnekar**, H Veeraraghavan. Co-distilled attention guided masked image modeling with noisy teacher for self-supervised learning on medical images. [\[Link\]](#)
International Conference on Medical Imaging with Deep Learning (MIDL), 2025.
7. **A Rangnekar**, C Kanan, MJ Hoffman. Semantic segmentation with active semi-supervised learning. [\[Link\]](#)
Winter Conference on Applications of Computer Vision (WACV), 2023.
8. **A Rangnekar**, C Kanan, MJ Hoffman. Semantic segmentation with active semi-supervised representation learning. [\[Link\]](#)
British Machine Vision Conference (BMVC), 2022.
9. **A Rangnekar**, N Mokashi, E J Ientilucci, C Kanan, MJ Hoffman. AeroRIT: A new scene for hyperspectral image analysis. [\[Link\]](#)
IEEE Transactions on Geoscience and Remote Sensing, 2020.
10. B Uz Kent, **A Rangnekar**, MJ Hoffman. Tracking in aerial hyperspectral videos using deep kernelized correlation filters. [\[Link\]](#)
IEEE Transactions on Geoscience and Remote Sensing, 2018.

Abstracts and Posters at Medical Conferences

11. **A Rangnekar**, N Mankuzhy, M Thor, A Wu, A Rimner, H Veeraraghavan. Foundation models with balanced data sampling enhance auto-segmentation for cardiac substructures. [\[Link\]](#)
AAPM Annual Meeting, 2025.
12. C Choi, J Jiang, **A Rangnekar**, N Mankuzhy, Y Cho, J Kim, A Rimner, M Thor, J Deasy, A Wu, H Veeraraghavan. Multimodal framework for predicting radiation-induced severe acute esophagitis in esophageal cancer. [\[Link\]](#)
AAPM Annual Meeting, 2025.
13. S Tan, J Jiang, **A Rangnekar**, H Veeraraghavan. Integrating multiple modalities with pretrained Swin foundation model for head and neck tumor segmentation. [\[Link\]](#)
AAPM Annual Meeting, 2025.
14. **A Rangnekar**, J Jiang, H Veeraraghavan. Enhancing Swin transformer with semantic attention for explainable prediction: a case study with lung cancer CT images. [\[Link\]](#)
AAPM Annual Meeting, 2024.

TEACHING EXPERIENCE

Guest lectures: Reinforcement learning (2016–2020), Transformers for vision (2020–2021), Semantic segmentation (2021). Mentored MS/PhD students at MSK and RIT.

REVIEWER

- Medical Physics, IEEE Transactions on Image Processing, and IEEE Transactions on Geoscience and Remote Sensing
- Computer Vision and Pattern Recognition (CVPR), International Conference on Computer Vision (ICCV), European Conference on Computer Vision (ECCV), Winter Conference on Applications of Computer Vision (WACV), and International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
- Tackling Climate Change with Machine Learning

TECHNICAL SKILLS

- Languages: Python, C++, MATLAB
- Frameworks: PyTorch, JAX, HuggingFace, MONAI, OpenCV
- Infrastructure: Git, Weights & Biases, Docker, Slurm, TensorBoard