





# Aneesh Rangnekar

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RESEARCH: Focus on perception and reasoning under data-centric constraints such as partial labels, low-quality data, and multi-institution generalization. Recent work includes self-supervised transformer learning, uncertainty quantification for radiologist-AI collaboration, and multimodal integration for trustworthy clinical decision-making.

## EDUCATION

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**Rochester Institute of Technology** Rochester, NY, USA  
Ph.D. Imaging Science August 2022  
Advisors: Dr. Matthew Hoffman, Dr. Christopher Kanan, Dr. Emmett Ientilucci

**Rochester Institute of Technology** Rochester, NY, USA  
M.S. Electrical Engineering August 2015  
Advisor: Dr. Eli Saber

## EMPLOYMENT

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**Research Fellow**, Memorial Sloan Kettering Cancer Center, New York, USA August 2022 – Present  
Mentor: Dr. Harini Veeraraghavan

- Curated large-scale clinical datasets and developed self-supervised pretraining pipelines for 2D and 3D transformers in medical imaging
- Designed cardiac auto-segmentation methods to support radiotherapy planning under limited data, with a long-term focus on minimizing acute cardiac toxicity in patients
- Built out-of-distribution detection pipelines for safe clinical deployment, emphasizing robustness and generalization under varying imaging conditions
- Developed classification and segmentation models across multiple cancer sites using standalone and multimodal vision-language architectures
- Contributing to open-source model reproducibility and collaborative clinical validation efforts across multiple research institutions

## ONGOING RESEARCH PROJECTS

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- [1] **A Rangnekar** and H Veeraraghavan. Beyond accuracy metrics: out-of-distribution for determining reliability of segmentation models in medical image segmentation for CT. Under preparation.
  - [2] J Jiang, **A Rangnekar**, C Choi, H Veeraraghavan. Self-distilled Masked Attention guided masked image modeling with noise Regularized Teacher (SMART) for medical image analysis. Under preparation. [[Paper](#)]

## SELECTED PUBLICATIONS

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- [1] **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]. [[Paper](#)]
  - [2] 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. [Under Review]. [[Paper](#)]
  - [3] **A Rangnekar**, K Boehm, E Aherne, I Nikolovski, N Gangai, Y Liu, D Zamarin, K Roche, S Shah, Y Lakhman, H Veeraraghavan. Improving ovarian cancer segmentation accuracy with transformers through AI-guided labeling. [Under Review]. [[Paper](#)]
  - [4] **A Rangnekar**, N Nadkarni, J Jiang, H Veeraraghavan. Quantifying uncertainty in lung cancer segmentation with foundation models applied to mixed-domain datasets. *SPIE Medical Imaging*, 2025. [[Paper](#)]
  - [5] J Jiang, **A Rangnekar**, H Veeraraghavan. Self-supervised learning improves robustness of deep learning lung tumor segmentation models to CT imaging differences. *Medical Physics*, 2025. [[Paper](#)]

- [6] J Jiang, **A Rangnekar**, H Veeraraghavan. Co-distilled attention guided masked image modeling with noisy teacher for self-supervised learning on medical images. *International Conference on Medical Imaging with Deep Learning (MIDL)*, 2025. [[Paper](#)]
- [7] **A Rangnekar**, C Kanan, M Hoffman. Semantic Segmentation with Active Semi-Supervised Learning. *Winter Conference on Applications of Computer Vision (WACV)*, 2023. [[Paper](#)]
- [8] **A Rangnekar**, C Kanan, M Hoffman. Semantic Segmentation with Active Semi-Supervised Representation Learning. *British Machine Vision Conference (BMVC)*, 2022. [[Paper](#)]

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## POSTERS AND PRESENTATIONS

- [1] **A Rangnekar**, N Mankuzhy, M Thor, A Wu, A Rimner, H Veeraraghavan. Foundation Models with Balanced Data Sampling Enhance Auto-Segmentation for Cardiac Substructures. *American Association of Physicists in Medicine (AAPM) Annual Meeting*, 2025. Linked to Pub [#1].
- [2] C Choi, J Jiang, **A Rangnekar**, N Mankuzhy, Y Cho, J Kim, A Rimner, M Thor, J Deasy, A Wu, J Kim, H Veeraraghavan. Multimodal Framework for Predicting Radiation-Induced Severe Acute Esophagitis in Esophageal Cancer. *AAPM*, 2025. Oral presentation, paper under preparation.
- [3] S Tan, J Jiang, **A Rangnekar**, H Veeraraghavan. Integrating Multiple Modalities with Pretrained Swin Foundation Model for Head and Neck Tumor Segmentation. *AAPM Annual Meeting*, 2025. Oral presentation.
- [4] **A Rangnekar**, N Nadkarni, J Jiang, H Veeraraghavan. Robustness of Pretrained Transformers on Lung Cancer Segmentation with Computed Tomography Scans. *AAPM*, 2024. Linked to Pub [#4].
- [5] **A Rangnekar**, J Jiang, H Veeraraghavan. Enhancing Swin Transformer with Semantic Attention for Explainable Prediction: A Case Study with Lung Cancer CT Images. *AAPM*, 2024. Oral presentation, linked to Pub [#6].
- [6] J Jiang, **A Rangnekar**, S Elguindi, L Cervino, J Moran, J Deasy, H Veeraraghavan. Organs at Risk Segmentations Using Foundational Models. *AAPM Annual Meeting*, 2023. Linked to Pub [#6].

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## INTERNSHIPS

**Research Intern**, SRI International, Princeton, NJ, USA *June – Nov 2018*

Mentors: Dr. Yi Yao and Ali Chaudhry

- Modified and fine-tuned Faster RCNN object detection pipeline for infrared imagery under limited data constraints
- Designed continual self-supervised approaches for object counting in aerial imagery with efficient data labeling

**Research Intern**, Conduent Labs – US, Webster, NY, USA *June – Aug 2017*

Mentors: Dr. Beilei Xu and Michael Furst

- Developed GAN-based models with categorical conditioning to enhance synthetic vehicle occupancy imagery to improve automated passenger counting at toll booths

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## SKILLS

**Programming Languages:** Python, R, MATLAB, SQL, C++ (learning)

**Tools & Libraries:** PyTorch,  $\LaTeX$ , Markdown, JAX (learning)

**Operating Systems:** Linux, macOS, Windows

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## PROFESSIONAL ACTIVITIES

### Reviewer

CVPR (2023–2025), ICCV (2023–2025), ECCV (2022–2025), MICCAI (2023–2025), Medical Physics (2023–2025)

### Student Advising

Nishant Nadkarni (Boston University, M.S. → CitiusTech),

Jorge T. Gomez (Cornell University, M.S. → Ph.D., ongoing)