

# Sharif Amit Kamran

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## WORK EXPERIENCE

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- **Janssen R&D (Johnson & Johnson)** Cambridge, MA  
*Radiology AI Postdoc* May 2023 - Present
- **University of Nevada, Reno** Reno, NV  
*Graduate Research Assistant - Prof. Alireza Tavakkoli and Prof. Sal Baker* August 2019 - May 2023
  - **Space-associated Neuroocular Syndrome (SANS):** Developed three novel image-to-image translation generative adversarial network (GAN) for Fundus to Fluorescein Angiography image generation. Also, built a deep convNet for identifying SANS degenerative disease in astronauts. **Funded by NASA Grant No. 80NSSC20K1831.**  
**Tools:** PyTorch, Pandas, NumPy, Monai, OpenCV.  
**Codes:** [Vision-Transformer GAN](#), [RV-GAN](#), [Robust-Attention-Network](#), [OpticNet-71](#)
  - **Calcium Event Extraction and Quantification:** Developed a software for automated tracking, segmentation, extraction and quantification of sub-cellular calcium events from videos using semi-supervised GAN and pseudo-labels generated by kernel-based trackers. **Funded by NIH (NIDDK) Grant No. R01 DK120759.**  
**Tools:** Tensorflow, Streamlit, NumPy, Keras, OpenCV, LabelMe, ImageJ.  
**Codes:** [4SM](#), [STMapAuto](#)
  - **2D and 3D Medical Image Segmentation:** Developed a novel Swin-Transformer based architecture for benign and malignant breast micro-mass segmentation from MRI and Ultrasound images, achieving 3-4% improvement over current state-of-the-art. Also, developed a attention-based Swin-Transformer with feature-similarity loss for 3D OCT fluid segmentation.  
**Tools:** PyTorch, Monai, NumPy, SimpleITK.
- **Genentech, Inc.** South San Fransisco, CA  
*Data, Analytics and Imaging Intern* May 2022 - Aug 2022
  - **3D Foveal Center Detection:** Built a 3D deep learning model for foveal-center detection from Optical Coherence Tomography Images. Submitted a provincial patent.  
**Tools:** SimpleITK, Tensorflow, Slurm, Pandas, Matplotlib, Pillow, NumPy.
  - **Retinal Attribute Measurement :** Developed and deployed retinal fluid area and retinal layer thickness interpolation pipeline using volumetric OCT images. The quantification module has been incorporated and deployed in Flywheel for usage by clinicians.  
**Tools:** Pandas, JSON, Pillow, NumPy.
- **Genentech, Inc.** South San Fransisco, CA  
*Data Science Intern* May 2021 - Dec 2021
  - **Vendor-specific OCT GAN:** Built a training and inference pipeline for a novel image-to-image translation GAN for synthesizing vendor-specific Optical Coherence Tomography (OCT) Images acquired from Zeiss and Spectralis.  
**Tools:** SimpleITK, Tensorflow, Slurm, SciPy, Pandas, OpenCV, Docker.
  - **Treatment-arm Prediction using Deep-learning:** Designed and evaluated multi-modal ML and CNN architectures for identifying between placebo and treatment arm for Ranibizumab (Lucentis) and Faricimab using Fundus and OCT-enface images. The drugs are for treating Wet Age-related Macular Degeneration (AMD) and Diabetic Macular Edema (DME).  
**Tools:** Tensorflow, Keras, Scikit-learn, NumPy, Pillow, Tensorboard, Docker.
  - **GA growth prediction:** Built a multi-modal regression network for estimating the growth rate of Geographical Atrophy.  
**Tools:** Tensorflow, Slurm, Scikit-learn, NumPy, Pandas, OpenCV, Tensorboard.

## EDUCATION

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- **University of Nevada, Reno** Reno, NV, USA  
*PhD. in Computer Science & Engineering* Aug 2019 - May 2023
- **University of Nevada, Reno** Reno, NV, USA  
*Master of Science in Computer Science & Engineering* Aug 2019 - Dec 2020
- **BRAC University** Dhaka, Bangladesh  
*Bachelor of Science in Computer Science & Engineering* Jan 2013 - Apr 2017

## SKILLS

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- **Programming Languages::** Python, R, C++, Bash (Shell Scripting), Matlab, Git, MySQL.
- **Imaging Expertise::** X-rays, OCT, Fundus, Fluorescein Angiography, MRI, PET, CT, Ultrasound.
- **Libraries & Programs:** NumPy, PyTorch, Monai, OpenCV, Tensorflow, Keras, Scikit-learn, SimpleITK, Pandas, Caffe, CoreML, ImageJ, Streamlit, LabelMe, Spark, Tensorboard, Weights & Biases.
- **Systems & Cloud-computing:** Slurm, Linux OS, Google Cloud Platform, AWS, Docker, Singularity.

## SELECTED PUBLICATIONS

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- [J1]: **Sharif Amit Kamran**, Khondker Fariha Hossain, Joshua Ong, Ethan Waisberg, Nasif Zaman, Salah A. Baker, Andrew G. Lee, MD, Alireza Tavakkoli, [FA4SANS-GAN: A Novel Machine Learning Generative Adversarial Network to Further Understand Ophthalmic Changes in Spaceflight Associated Neuro-Ocular Syndrome \(SANS\)](#), 2024, *Ophthalmology Science, Elsevier*.
- [J2]: Phani Srivatsav Paladugu, Joshua Ong, Nicolas Nelson, **Sharif Amit Kamran**, Ethan Waisberg, Nasif Zaman, Rahul Kumar, Roger Daglius Dias, Andrew Go Lee, Alireza Tavakkoli, [Generative Adversarial Networks in Medicine: Important Considerations for this Emerging Innovation in Artificial Intelligence](#), 2023, *Annals of Biomedical Engineering, Springer*.
- [J3]: **Sharif Amit Kamran**, Hussein Moghnieh, Khondker Fariha Hossain, Nyanbol Kuol, Sarah Riar, Allison Bartlett, Alireza Tavakkoli, Salah A Baker, [Software for segmenting and quantifying calcium signals using multi-scale generative adversarial networks](#), 2022, in *Star Protocols, Cell Press*.
- [J4]: **Sharif A. Kamran**, Khondker F. Hossain, Hussein Moghnieh, Sarah Riar, Allison Bartlett, Alireza Tavakkoli, Kenton M. Sanders, and Salah A. Baker, [New open-source software for subcellular segmentation and analysis of spatiotemporal fluorescence signals using deep learning](#), 2022, in *iScience, Cell Press*.
- [J5]: Joshua Ong, Alireza Tavakkoli, Nasif Zaman, **Sharif A. Kamran**, Ethan Waisberg, Nikhil Gautam and Andrew G. Le, [Terrestrial health applications of visual assessment technology and machine learning in spaceflight associated neuro-ocular syndrome](#), 2022, in *npj Microgravity, Nature*.
- [J6]: Joshua Ong, Alireza Tavakkoli, Gary Strangman, Nasif Zaman, **Sharif Amit Kamran**, Quan Zhang, Vladimir Ivkovic, Andrew G Lee, [Neuro-ophthalmic imaging and visual assessment technology for spaceflight associated neuro-ocular syndrome \(SANS\)](#), 2022, *Survey of Ophthalmology, Elsevier*.
- [J7]: **Sharif A. Kamran**, Alireza Tavakkoli, Khondker F. Hossain and Stewart L. Zuckerbrod, [A Novel Deep Learning Conditional Generative Adversarial Network for Producing Angiography Images from Retinal Fundus Photographs](#), 2021, *Scientific Reports, Nature*.
- [J8]: Wesley Leigh, Guillermo Del Valle, **Sharif A. Kamran**, Bernard T Drumm, Alireza Tavakkoli, Kenton M Sanders, Sal Baker [A High Throughput Machine-Learning Driven Analysis of Ca<sup>2+</sup> Spatio-temporal Maps](#), 2020, *Cell Calcium, Elsevier*.
- [C1]: Khondker Fariha Hossain, **Sharif Amit Kamran**, Joshua Ong, Andrew G Lee, Alireza Tavakkoli, [Revolutionizing Space Health \(Swin-FSR\): Advancing Super-Resolution of Fundus Images for SANS Visual Assessment Technology](#), in *MICCAI 2023*.
- [C2]: **Sharif Amit Kamran**, Khondker Fariha Hossain, Alireza Tavakkoli, George Bebis, Sal Baker, [SWIN-SFTNet: Spatial Feature Expansion and Aggregation using Swin Transformer For Whole Breast micro-mass segmentation](#), in *IEEE ISBI 2023*.
- [C3]: **Sharif A. Kamran**, Khondker F. Hossain, Alireza Tavakkoli, Stewart L. Zuckerbrod and Salah A. Baker, [Feature Representation Learning for Robust Retinal Disease Detection from Optical Coherence Tomography Images](#), in *MICCAI 2022*.
- [C4]: **Sharif A. Kamran**, Khondker F. Hossain, Alireza Tavakkoli, Stewart L. Zuckerbrod, and Salah A. Baker, [VTGAN: Semi-supervised Retinal Image Synthesis and Disease Prediction using Vision Transformers](#), in *ICCV 2021*.
- [C5]: **Sharif A. Kamran**, Khondker F. Hossain, Alireza Tavakkoli, Stewart L. Zuckerbrod, Kenton M. Sanders and Salah A. Baker, [RV-GAN: Segmenting Retinal Vascular Structure in Fundus Photographs Using a Novel Multi-scale Generative Adversarial Network](#), in *MICCAI 2021*.
- [C6]: **Sharif A. Kamran**, Khondker F. Hossain, Alireza Tavakkoli, Stewart L. Zuckerbrod, [Attention2AngioGAN: Synthesizing Fluorescein Angiography from Retinal Fundus Images using Generative Adversarial Networks](#), in *ICPR 2020*.
- [C7]: **Sharif A. Kamran**, Alireza Tavakkoli, Stewart L. Zuckerbrod, [Improving Robustness using Joint Attention Network For Detecting Retinal Degeneration From Optical Coherence Tomography Images](#), in *ICIP 2020*.

## HONORS AND AWARDS

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- Received Best Reviewer Award at 32nd British Machine Vision Conference (BMVC) 2021.
- Received MICCAI Student Travel Award 2021 out of thousands of presenters.
- Only CSE graduate student out of 4,000+ students, to receive UNR Graduate Dean's Merit Scholarship for 2019-2020.
- Received Outstanding Graduate Student Award Spring'21 and Spring'22 by University of Nevada, Reno.

## ACADEMIC SERVICES

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- **Reviewer:** IEEE TMI, JAMA Ophthalmology, Medical Physics, Biomed Optics Express, TVST, BMVC'20-'21, WACV'21-'22.
- **Instructor:** CS687/CS487 : Fundamentals of Deep Learning, Spring'23, University of Nevada, Reno.
- **Graduate Mentor:** US Army Educational Outreach Program, Fall'20.
- **Student Organizer:** International Symposium on Visual Computing, ISVC'20, ISVC'22.
- **Teaching Assistant:**
  - CS791: Mass Detection in Mammograms, Spring'22 and Fall'22, University of Nevada, Reno
  - CS687/487: Fundamentals of Deep Learning, Spring'21 and Spring'20, University of Nevada, Reno