Sharif Amit Kamran

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Flagstaff, AZ

Work Experience

- **Senior AI & Computer Vision Engineer** — Flagstaff, AZ
  Johnson & Johnson Innovative Medicine — *May 2025 - Present*
  - **AI-driven Medical Imaging Solutions for Immuno-dermatology and Ophthalmology**: Leading the AI-driven Immuno-dermatology and Ophthalmology portfolios, with a focus on advancing foundational and translational research at the intersection of deep learning and clinical medicine. My work involves developing large language-vision foundation models for immuno-dermatology, with a focus on disease prognosis across observational and interventional clinical studies. In parallel, I build AI-based solutions for localizing degeneration within the macular subspace, targeting various underlying retinal diseases.
- **Radiology AI Postdoc** — Reno, NV
  Johnson & Johnson Innovative Medicine — *May 2023 - May 2025*
  - **Automated Immuno-dermatology Disease Prediction**: Built an interpretable transformer-based weakly supervised learning model for predicting psoriasis, which achieves $>$ 90% AUC for severity classification. Moreover extended this work to predict absolute PASI with $>$ 85% Intraclass correlation coefficient (ICC). Submitted a provincial patent. Published four abstracts (EADV2024 & ESDR2024) and one technical manuscript (ISBI 2025 Oral Presentation) **Link:** Paper.
    Tools: PyTorch, Pandas, NumPy, OpenCV. Scikit-learn.
- **Graduate Research Assistant** — Reno, NV
  University of Nevada, Reno — *August 2019 - May 2023*
  - **Space-associated Neuroocular Syndrome (SANS)**: Developed three novel image-to-image translation generative adversarial networks (GAN) for Fundus to Fluorescein Angiography image generation. Also, built a deep convNet for identifying SANS degenerative disease in astronauts achieving $>$ 82% F1-score.
    Tools: Tensorflow, Pandas, NumPy, Matplotlib, OpenCV.
    Codes: SwinFSR, Vision-Transformer GAN, RV-GAN, Robust-Attention-Network,OpticNet-71
  - **Calcium Video Event Extraction and Quantification**: Developed a first-of-its-kind software for automated tracking, segmentation, extraction, and quantification of sub-cellular calcium events from videos using a novel pipeline consisting of semi-supervised GAN and kernel-based (pseudo-labels trained) trackers.
    Tools: Tensorflow, Streamlit, NumPy, Keras, OpenCV, LabelMe, ImageJ.
    Codes: 4SM, STMapAuto
  - **3D Medical Image Segmentation**: Developed a novel knowledge distillation-based multi-teacher transformer architecture which shows improved results for multi-modal (CT, MRI and PET) 3D head & neck tumor segmentation and prostate cancer segmentation with 5x to 10x parameter reduction. Also, developed an attention-based Swin-Transformer with a feature similarity loss for 3D OCT fluid segmentation, achieving a 72% Area-under-the-curve score.
    Tools: PyTorch, Monai, NumPy, SimpleITK. **Codes:** Teachformer, SwinVFTR
- **Data, Analytics and Imaging Intern** — South San Fransisco, CA
  Genentech, Inc. — *May 2022 - Aug 2022*
  - **3D Foveal Center Detection**: Built a 3D deep learning model for foveal-center detection from Optical Coherence Tomography Images with a mean absolute score of less than 1 mm. Submitted a provincial patent.
    Tools: SimpleITK, Tensorflow, Slurm, Pandas, Matploblib, 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.
- **Data Science Intern** — South San Fransisco, CA
  Genentech, Inc. — *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 achieving more than 80% F1-score. 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 with a low absolute error.
    Tools: Tensorflow, Slurm, Scikit-learn, NumPy, Pandas, OpenCV, Tensorboard.

Education

- **University of Nevada, Reno** — Reno, NV, USA
  PhD. in Computer Science & Engineering
- **University of Nevada, Reno** — Reno, NV, USA
  Master of Science in Computer Science & Engineering
- **BRAC University** — Dhaka, Bangladesh
  Bachelor of Science in Computer Science & Engineering

Skills

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

Selected Publications

Journals:

- [**J1**]: **Sharif Amit Kamran**, Khondker Fariha Hossain, Joshua Ong, Nasif Zaman, Ethan Waisberg, Phani Paladugu, Andrew G Lee, Alireza Tavakkoli, SANS-CNN: An automated machine learning technique for spaceflight associated neuro-ocular syndrome with astronaut imaging data, 2024, *npj Microgravity, Nature.*
- [**J2**]: **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.*
- [**J3**]: **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.*
- [**J4**]: **Sharif A. Kamran**, Alireza Tavakkoli, Khondker F. Hossain and Stewart L. Zuckerbroad, A Novel Deep Learning Conditional Generative Adversarial Network for Producing Angiography Images from Retinal Fundus Photographs, 2021, *Scientific Reports, Nature.*

Conference Proceedings:

- [**C1**]: **Sharif Amit Kamran**, Molly Lucas, Brendon Lutnick, Chaitanya Parmar, Basudha Pal, Asha Shah, David Apfel, Steven Fakharzadeh, Lloyd Miller, Stephen Yip, Kristopher Standish, Gabriela Oana Cula, PSO-NET: Development of an Automated Psoriasis Assessment System Using Attention-Based Interpretable Deep Neural Networks, in *IEE ISBI 2025.*
- [**C2**]: 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.*
- [**C3**]: **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 *IEE ISBI 2023.*
- [**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.*

Online Courses & Certifications

- **Deep Learning Specialization**: Coursera, Credential No.: NM9SMAJW9USM
- **Applied Machine Learning in Python**: Coursera, Credential No.: LS77LUGT2WBK
- **AI for Medical Diagnosis**: Coursera, Credential No.: L3VQWTDTAB9T
- **Group 1 Social Behavioral Research Investigators and Key Personnel Group (IRB)**: CITI Program: 44175128

Academic Services

- **Graduate Instructor**: CS687/CS487 : Fundamentals of Deep Learning, Spring'23, University of Nevada, Reno.
- **Reviewer**: IEEE TMI, JAMA Ophthalmology, Medical Physics, Biomed Optics Express, TVST, BMVC2020-2021, WACV2021-2022, MICCAI 2024-2025.
- **Teaching Assistant**: CS791: Mass Detection in Mammograms, Spring'22 and Fall'22, University of Nevada, Reno.
- **Teaching Assistant**: CS687/487: Fundamentals of Deep Learning, Spring'21 and Spring'20, University of Nevada, Reno.