

Shayan Shekarforoush

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[Google Scholar](#) — [GitHub](#) — [Website](#)

Education

- **Ph.D. in Computer Science, University of Toronto** 2020-
Supervisors: David J. Fleet, Marcus A. Brubaker
Thesis: "Neural Representation Learning for Pose and Structure Determination in Cryo-EM Reconstruction"
- **B.Sc. in Computer Engineering, Sharif University of Technology** 2015-2020
Minor in Mathematics

Internship Experience

- **Samsung AI Center, Toronto** 2022-2023
PhD Intern
Developing computational imaging algorithms with focus on joint-deblurring-denoising
- **Technical University of Munich (TUM)** 2018-2020
Undergraduate Intern
Research on Graph Neural Networks for medical application at Computer Aided Medical Procedures & Augmented Reality Lab (CAMPAR)

Publications

Peer-Reviewed Conference Papers

1. Shayan Shekarforoush, David Lindell, Marcus Brubaker, and David Fleet. CryoSPIN: Improving Ab-Initio Cryo-EM Reconstruction with Semi-Amortized Pose. In *Neural Information Processing Systems (NeurIPS)*, 2025.
2. Shayan Shekarforoush, David Lindell, David Fleet, and Marcus Brubaker. Residual Multiplicative Filter Networks for Multiscale Reconstruction. In *Neural Information Processing Systems (NeurIPS)*, 2023.
3. Anees Kazi, Shayan Shekarforoush, S. Arvind Krishna, Hendrik Burwinkler, Gerome Vivar, Benedict Wiestler, Karsten Kortüm, Seyed-Ahmad Ahmadi, Shadi Albarqouni, and Nassir Navab. Graph Convolution Based Attention Model for Personalized Disease Prediction. In *Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2019.
4. Anees Kazi, Shayan Shekarforoush, S.Arvind krishna, Hendrik Burwinkler, Gerome Vivar, Karsten Kortuem, Seyed-Ahmad Ahmadi, Shadi Albarqouni, and Nassir Navab. InceptionGCN: Receptive Field Aware Graph Convolutional Network for Disease. In *Information Processing in Medical Imaging (IPMI)*, 2019
5. Anees Kazi, S.Arvind krishna, Shayan Shekarforoush, Karsten Kortuem, Shadi Albarqouni, and Nassir Navab. Self-Attention Equipped Graph Convolutions for Disease Prediction In *International Symposium on Biomedical Imaging (ISBI 2019)*, 2019

Peer-Reviewed Workshop Papers

1. Shayan Shekarforoush, David Lindell, Marcus Brubaker, and David Fleet. [Improving Ab-Initio Cryo-EM Reconstruction with Semi-Amortized Pose](#). In *NeurIPS Workshop on Machine Learning for Structural Biology (MLSB)*, 2025.
2. Geoffrey Woollard, Shayan Shekarforoush, Frank Wood, Marcus Brubaker, and Khanh Dao Duc. [Physics aware Inference for the Cryo-Em Inverse Problem: Anisotropic Network Model Heterogeneity, Global Pose and Microscope Defocus](#). In *NeurIPS Workshop on Machine Learning for Structural Biology (MLSB)*, 2023.

Preprints

1. Shayan Shekarforoush, Amanpreet Walia, Marcus Brubaker, Konstantinos Derpanis, and Alex Levinstein. [Dual Camera Joint Deblurring-Denoising](#). arXiv:2309.08826, 2023

Awards and Honors

- Vector Research Grant, \$6000 per year, 2021-2024
- Mitacs Accelerate, Samsung AI and University of Toronto, \$21,000, Summer 2022
- Travel Award, Pacific Institute for the Mathematical Sciences, May 2022
- Ranked 1st based on GPA among Bachelors of Computer Engineering, Sharif University of Technology, 2020
- International Undergraduate Excellence Award, Technical University of Munich, €4,500 per year , 2018-2019
- Ranked 92nd in National Universities Entrance Exam, Iran, 2015

Talks and Presentations

- Presentation at Research Symposium “Remarkable” Event, Vector Institute, 2025
- Contributed Talk at Machine Learning in Structural Biology workshop, NeurIPS, 2025
- Presentation at In Situ and Correlative Microscopy Group, University of Toronto, 2022
- Workshop of Mathematical and Computational Challenges in Cryo-EM, University of British Columbia, 2022

Teaching Assistance and Mentorship

Students:

- Gerd Bizi, Cryo-EM Reconstruction for Vesicle Particles (ongoing)
- Ariel Chen, Burst Imaging and NeRFs, 2024 (now MSCS student at Stanford University)

Courses:

- Stochastic Processes
- Information Theory
- Computational Imaging
- Introduction to Image Understanding (Head TA)
- Introduction to ML (Head TA)