

KIANOUSH FALAHKHEIRKHAH

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EDUCATION

University of Illinois at Urbana Champaign

2016 – present

Ph.D. candidate: Chemical Engineering prof. Rohit Bhargava's Lab

Thesis: Engineering the process of cancer diagnosis using Chemical imaging & machine learning

Sharif University of Technology

2012- 2016

Bachelor of Science in Chemical Engineering

Thesis: Developing an object-oriented framework for the analysis of phases equilibrium

EXPERIENCE & RESEARCH

University of Illinois at Urbana-Champaign

Champaign, IL

Research Assistant

2016 – Present

- Developed AI models to enhance the quality of cancer diagnosis
- Created deep learning frameworks to improve label-free imaging such as IR
- Collaborated with major health institutions such as Mayo Clinics and MD-Anderson for getting samples, creating annotations, and reviewing the output of models
- Planned and managed multiple projects for 3 high-school, 9 undergraduate, and 4 graduate students

National Center for Supercomputing Applications (NCSA)

Champaign, IL

Research Assistant

2019 – Present

- Developed a generative adversarial network to convert MRI images to MRF
- Established an accurate and reliable MRI reconstruction method based on MRF data
- Collaborated with Mayo Clinic and a team in NCSA for data preparation and model development

UIUC Teacher Assistant

Champaign, IL

Computational Methods in CHBE & 500 level courses

Aug 2017-Dec 2017

- Managed and held 2 lab sessions weekly for 30 undergraduate students to teach python & MATLAB
- Helped students troubleshoot problems encountered during projects

Pars Company

Tehran, Iran

Junior Research Scientist

June 2015-Aug 2015

- Used MATLAB to develop computational software for optimizing pipe and separator
- Determined the flow to inlet pipe to avoid unfavorable flow patterns

PUBLICATIONS

- **Kianoush Falahkheirkhah**, Tao Guo, Michael Hwang, Pheroze Tamboli, Christopher G. Wood, Jose A. Karam, Kanishka Sircar, and Rohit Bhargava. "A generative adversarial approach to facilitate archival-quality histopathologic diagnoses from frozen tissue sections." *arXiv preprint arXiv:2108.10550* (2021).
- **Kianoush Falahkheirkhah**, Kevin Yeh, Shachi Mittal, Luke Pfister, and Rohit Bhargava. "Deep learning-based protocols to enhance infrared imaging systems." *Chemometrics and Intelligent Laboratory Systems* (2021).
- Rohit Bhargava, and **Kianoush Falahkheirkhah**. "Enhancing hyperspectral imaging." *Nature Machine Intelligence* (2021).
- Eric Zimmermann, Sudipta S. Mukherjee, **Kianoush Falahkheirkhah**, Mark C. Gryka, Andre Kajdacsy-Balla, Wohaib Hasan, George Giraud, Fred Tibayan, Jai Raman, and Rohit Bhargava. "Detection and Quantification of Myocardial Fibrosis Using Stain-Free Infrared Spectroscopic Imaging." *Archives of pathology & laboratory medicine* (2021).
- Martin Schnell, Shachi Mittal, **Kianoush Falahkheirkhah**, Anirudh Mittal, Kevin Yeh, Seth Kenkel, Andre Kajdacsy-Balla, P. Scott Carney, and Rohit Bhargava. "All-digital histopathology by infrared-optical hybrid microscopy." *Proceedings of the National Academy of Sciences* (2020).
- **Kianoush Falahkheirkhah**, Kevin Yeh, Shachi Mittal, Luke Pfister, and Rohit Bhargava. "A deep learning framework for morphologic detail beyond the diffraction limit in infrared spectroscopic imaging." *arXiv preprint arXiv:1911.04410* (2019).

CONFERENCE PRESENTATIONS & POSTERS

- Ghazal Azarfar, **Kianoush Falahkheirkhah**, Meera Gopu, Jennifer Pfister, Sergey V. Brodsky, Tibor Nadasdy, Georgina Cheng, Anjali A. Satoskar, and Rohit Bhargava. "Infrared chemical imaging for histologic interpretation of renal tissue." In *Advanced Chemical Microscopy for Life Science and Translational Medicine* (2021)
- **Kianoush Falahkheirkhah**, Kevin Yeh, Shachi Mittal, Luke Pfister, and Rohit Bhargava. "A Deep Learning Framework to Expedite Infrared Spectroscopy for Digital Histopathology." *International Symposium on Biomedical Imaging (ISBI)* (2020).
- Martin Schnell, Shachi Mittal, **Kianoush Falahkheirkhah**, Anirudh Mittal, Kevin Yeh, Seth Kenkel, Andre Kadjacsy-Balla, P. Scott Carney, and Rohit Bhargava. "Infrared Optical Hybrid (IR-OH) Microscopy for Label-Free Histopathology." In *Frontiers in Optics* (2020).
- **Kianoush Falahkheirkhah**, Kevin Yeh, Rohit Bhargava. "Digital histopathology by stainless stained chemical images." *SPIE Medical imaging* (2019).
- Shachi Mittal, Andre Balla, Luke Pfister, Catalin Stoean, **Kianoush Falahkheirkhah**, and Rohit Bhargava. "Tumor Identification and Grading on Histopathology Images Using Deep Learning." In *LABORATORY INVESTIGATION* (2019)
- **Kianoush Falahkheirkhah**, Kevin Yeh, Shachi Mittal, Rohit Bhargava. "High quality and detail in stainless histopathologic images using mid- infrared spectroscopic images." *SPIE Photonic West* (2017).

RELEVANT SKILLS

- **Programming:** Python, PyTorch, MATLAB, C++, C, NumPy/SciPy, Scikit-Learn
- **Other skills:** Computer vision, Artificial intelligence, Statistical learning, Deep Learning, Data Analysis, signal processing

HONORS & AWARDS

- Thomas and Margaret Huang Award for Graduate Research *April 2021*
- Medical imaging best poster award *Feb 2019*

LEADERSHIP

Iranian Cultural Association

Champaign, IL

Officer Board – Vice President & Secretary

2017– 2018

- Created effective budget plans to ensure funding was available throughout the year
- Coordinated and marketed all fundraising events for the society utilizing various social media channels