# Alan Q. Wang

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## Education

2019 – 2024 **Ph.D., Cornell University** in Electrical and Computer Engineering.
Thesis: "Interpretability, Robustness, and Controllability in Machine Learning Methods for Medical Imaging"
Committee: Mert Sabuncu (advisor), Chris Xu, Jayadev Acharya

2015 – 2019 **B.Sc., University of Illinois at Urbana-Champaign** in Computer Engineering.
Thesis: *Structural Consistency for Diverse Video Colorization with Deep Learning*

## Research Experience

2019 – 2024 **Graduate Researcher.** Cornell University
Advisor: Mert Sabuncu

2022 **Research Intern.** Google
Designed neural network architectures for ad price prediction in first-price auctions

2021 **Research Intern.** Google
Designed algorithms for anomaly detection and localization

2019 **Research Intern.** MIT Lincoln Laboratory
Designed algorithms for wireless communication channels using deep networks

## Research Publications

### Journal Articles

1. M. Aghasizade, A. Kiyoumarsioskouei, S. Hashemi, M. Torabinia, A. Caprio, M. Rashid, Y. Xiang, H. Rangwala, T. Ma, B. Lee, **A. Wang**, M. Sabuncu, S. C. Wong, and B. Mosadegh, "A Coordinate-Regression-Based Deep-Learning Model for Catheter Detection During Structural Heart Interventions," *Applied Sciences*, 2023.
2. T. Ma, **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, "Hyper-Convolutions Via Implicit Kernels for Medical Image Analysis," *Medical Image Analysis*, 2023.
3. **A. Q. Wang**, B. K. Karaman, H. Kim, J. Rosenthal, R. Saluja, S. I. Young, and M. R. Sabuncu, "A Framework for Interpretability in Machine learning For Medical Imaging," *Under review*, 2023.
4. **A. Q. Wang** and M. R. Sabuncu, "A Flexible Nadaraya-Watson Head Can Offer Explainable and Calibrated Classification," *Transactions on Machine Learning Research*, 2023.
5. **A. Q. Wang**, E. M. Yu, A. V. Dalca, and M. R. Sabuncu, "A Robust and Interpretable Deep Learning Framework for Multi-Modal Registration Via Keypoints," *Medical Image Analysis*, 2023.
6. G. Zhou, Y. Chen, C. Chien, L. Revatta, J. Ferdous, M. Chen, S. Deb, S. D. L. Cruz, **A. Wang**, B. Lee, M. Sabuncu, W. Browne, H. Wun, and B. Mosadegh, "Deep Learning Analysis of Blood Flow Sounds to Detect Arteriovenous Fistula Stenosis," *NPJ Digital Medicine*, 2023.
7. **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, "Computing Multiple Image Reconstructions with a Single Hypernetwork," *Machine Learning for Biomedical Imaging*, 2022.
8. C. D. Bahadir, **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, "Deep-Learning-Based Optimization of the Under-Sampling Pattern in MRI," *IEEE Transactions on Computational Imaging*, 2020.

### Conference Papers

1. X. He, **A. Wang**, and M. R. Sabuncu, "Neural Pre-Processing: A Learning Framework for End-to-End Brain MRI Pre-processing," in *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2023.
2. M. Nguyen, **A. Q. Wang**, H. Kim, and M. R. Sabuncu, "Robust learning via conditional prevalence adjustment," in *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2023.
3. **A. Q. Wang**, M. Nguyen, and M. R. Sabuncu, "Learning Invariant Representations with a Nonparametric Nadaraya-Watson Head," in *Conference on Neural Information Processing Systems (NeurIPS)*, 2023.
4. E. M. Yu, **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, "KeyMorph: Robust Multi-modal Affine Registration via Unsupervised Keypoint Detection," in *Medical Imaging with Deep Learning (MIDL)*, 2022.
5. **A. Q. Wang**, A. K. LaViolette, L. Moon, C. Xu, and M. R. Sabuncu, "Joint Optimization of Hadamard Sensing and Reconstruction in Compressed Sensing Fluorescence Microscopy," in *Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2021.

### Workshop Papers

1. **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, *HyperRecon: Regularization-Agnostic CS-MRI Reconstruction with Hypernetworks*, 2021.
2. **A. Q. Wang**, A. V. Dalca, and M. R. Sabuncu, *Neural Network-Based Reconstruction in Compressed Sensing MRI Without Fully-Sampled Training Data*, 2020.
3. J. Zhang, H. Zhang, **A. Wang**, Q. Zhang, M. Sabuncu, P. Spincemaille, T. D. Nguyen, and Y. Wang, *Extending LOUPE for k-Space Under-Sampling Pattern Optimization in Multi-coil MRI*, 2020.

## Teaching

Fall 2022 — **Teaching Assistant** Applied Digital Signal Processing and Communications (ECE 5415).
Graduate-level course at Cornell Tech
Held office hours, answered online forum questions, and conducted recitations/lectures

Spring 2020 — **Teaching Assistant** Digital Signal and Image Processing (ECE 4250).
Upper and graduate-level course at Cornell University
Held office hours, answered online forum questions, and conducted recitations/lectures

Fall 2019 — **Teaching Assistant** Machine Learning (CS 446).
Upper-level course at University of Illinois
Responsible for grading assignments and holding office hours

## Miscellaneous

### Service

- **Reviewer** for IEEE Transactions on Image Processing, Medical Image Analysis, Neurocomputing, WACV, MELBA
- **Organizer** for Machine Learning in Medicine Seminar Series

### Mentoring

2022 — Aanika Jain, high school student

## Miscellaneous (continued)

2020 Leo Moon, Cornell undergrad

Mayur Bhandary, Cornell Tech Master's Student

### Awards

2023 **DAAD AInet Fellow**

2021 **MICCAI Student Travel Award**

2019 **Cornell Fellowship Award**