

Peiqi Wang

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Education

Massachusetts Institute of Technology Cambridge, MA
Ph.D. in Electrical Engineering and Computer Science Sep 2019 – present
S.M. in Electrical Engineering and Computer Science Sep 2019 – Feb 2022

University of Toronto Toronto, ON
B.S. in Computer Science, with High Distinction. GPA: 3.95/4.0 Sep 2014 – May 2019

Industry Experience

Meta Jun 2024 – Dec 2024
Research Scientist Intern Menlo Park, CA
Investigated the optimal allocation of inference compute across key scaling factors in video vision language models. Conducted large-scale training sweeps and parametric modeling of task performance to identify the inference compute-optimal frontier. [3]

MIT-IBM Watson AI Lab Jun 2023 – Aug 2023
Research Intern Cambridge, MA
Developed a dataset diversity measure strongly correlated with downstream instruction-following performance. Leveraged determinantal point processes to quantify diversity and optimize subset selection for instruction-tuning datasets. [6]

Deep Genomics Sep 2017 – Aug 2018
Research Student & Summer Intern Toronto, ON
Improved GenomeKit, a C++ library for genomic analysis, by extending its functionality. Developed and benchmarked a high-speed tool for approximating energy-based RNA-RNA interaction predictors. Improved a key model for alternative splicing.

Research Experience

Medical Vision Group, MIT CSAIL Sep 2019 – present
Research Assistant Advisor: Polina Golland. Cambridge, MA

- Proposed a novel approach to assess and improve the calibration of humans and computational models that communicate confidence using linguistic expressions of certainty [2].
- Improved vision language pretraining methods to better capture local correspondences [9] and to alleviate the performance drop from sampling false negatives [8].
- Developed a method that injects domain knowledge to construct models that provide clinically feasible supporting evidence. [10]

Dynamic Graphics Project, University of Toronto Sep 2018 – May 2019
Research Assistant Advisor: Kyros Kutulakos. Toronto, ON
Developed structured light reconstruction algorithms for coded-exposure camera.

Numerical Analysis Group, University of Toronto May 2018 – Nov 2018
Research Assistant Advisor: Kenneth Jackson. Toronto, ON
Analyzed and resolved an inconsistency in a two-level importance sampling algorithm for simulating portfolio credit risk under the Gaussian Copula model. Developed and implemented Monte Carlo methods with variance reduction techniques in Julia to improve efficiency.

Teaching Experience

MIT 6.3700/6.3702 Introduction to Probability Sep 2022 – Dec 2022
Teaching Assistant
Designed problem sets and exam questions. Led office hours and tutorials for ~ 80 students.

Academic Service

Organizer: Boston Medical Imaging Workshop 2024

Conference Reviewer: MedNeurips 22-23, AI4Science 23, MICCAI 23-24, ML4H 23-24, WACV 24-25, MIDL 24-25, NeurIPS 24, ECCV 24, ICLR 25, CVPR 25

Journal Reviewer: IEEE Transactions on Medical Imaging (TMI), Medical Image Analysis (MedIA), Machine Learning for Biomedical Imaging (MELBA)

Skills

Programming Languages: Python, C/C++, Julia, R, Racket, MATLAB, JavaScript, \LaTeX .

Libraries and Tools: PyTorch, NumPy, Pandas, Matplotlib, Jax, Linux, Slurm, Git, SQL, MongoDB, React, Node.js, HTML, CSS.

Honors and Awards

Takeda Fellowship (2023), Dean's List (2015-2019), Lawrence And Sharen Ho International Scholarship (2017), The Kathryn Anne Radford Scholarships (2016), The Milne Research Award (2016), Adel S Sedra Undergraduate Scholarship In Mathematics (2015), University of Toronto Scholars Awards (2014).

Publications

1. Y. Liu, **P. Wang**, S. Diaz, B. Billot, E. A. Turk, E. Grant, and P. Golland. Fetuses Made Simple: Modeling and Tracking of Fetal Shape and Pose. In: *under review for CVPR 2025*.
2. **P. Wang**, B. D. Lam, Y. Liu, A. Asgari-Targhi, R. Panda, W. M. Wells, T. Kapur, and P. Golland. Calibrating Expressions of Certainty. In: *under review for ICLR 2025*.
3. **P. Wang**, S. Peng, X. Zhang, H. Yu, Y. Yang, L. Huang, F. Liu, and Q. Wang. Inference Compute-Optimal Video Vision Language Models. In: *under review for ACL 2025*.
4. B. D. Lam, S. Ma, I. Kovalenko, **P. Wang**, O. Jafari, A. Li, and S. Horng. MIMIC-IV-Ext-PE: Using a Large Language Model to Predict Pulmonary Embolism Phenotype in the MIMIC-IV Dataset. In: *Research and Practice in Thrombosis and Hemostasis (RPTH)*. 2024.
5. B. D. Lam, **P. Wang**, S. Ma, O. Jafari, I. Kovalenko, and A. Li. Large language models for chart review: How machine learning can accelerate hematology research. In: *Blood VTH*. 2024.
6. **P. Wang**, Y. Shen, Z. Guo, M. Stallone, Y. Kim, P. Golland, and R. Panda. Diversity Measurement and Subset Selection for Instruction Tuning Datasets. 2024. arXiv: 2402.02318.
7. Z. Guo, **P. Wang**, Y. Wang, and S. Yu. Improving Small Language Models in Domain-Specific QA via Generative Data Augmentation. In: *KDD LLM4AI Workshop*. 2023.
8. **P. Wang**, Y. Liu, C.-Y. Ko, W. M. Wells, S. Berkowitz, S. Horng, and P. Golland. Sample-Specific Debiasing for Better Image-Text Models. In: *Machine Learning for Healthcare Conference (MLHC)*. 2023.
9. **P. Wang**, W. M. Wells, S. Berkowitz, S. Horng, and P. Golland. Using Multiple Instance Learning to Build Multimodal Representations. In: *Information Processing in Medical Imaging (IPMI)*. 2023.
10. **P. Wang**, R. Liao, D. Moyer, S. Berkowitz, S. Horng, and P. Golland. Image Classification with Consistent Supporting Evidence. In: *Machine Learning for Health (ML4H)*. 2021.
11. N. Kanwar, K. Carmine-Simmen, R. Nair, C. Wang, S. Moghadas-Jafari, H. Blaser, D. Tran-Thanh, D. Wang, **P. Wang**, et al. Amplification of a Calcium Channel Subunit CACNG4 Increases Breast Cancer Metastasis. In: *EBioMedicine*. 2020.
12. H. D. Gonorazky, S. Naumenko, A. K. Ramani, V. Nelakuditi, P. Mashouri, **P. Wang**, et al. Expanding the Boundaries of RNA Sequencing as a Diagnostic Tool for Rare Mendelian Disease. In: *The American Journal of Human Genetics*. 2019.