MINH TO (NGUYEN NHAT MINH TO)

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RESEARCH INTERESTS

Robust machine learning under distribution shift; prototype-based learning and ensemble methods; self-supervised and semi-supervised learning; AI fairness; AI for medical imaging (MRI, ultrasound).

EDUCATION

University of British Columbia *09/2020 - 08/2025*
PhD Student in Electrical and Computer Engineering
Graduate Support Initiative Awards
Machine Learning in CAI Award: Runner Up
41st World University Rankings 2025

Sejong University *03/2017 - 08/2019*
Master of Computer Science and Engineering GPA: 4.42 / 4.5
Graduate Research Fellowship
5th Computer Science in South Korea

Vietnam National University, Ho Chi Minh - International University *10/2010 - 09/2014*
Bachelor of Biomedical Engineering GPA: 3.67 / 4
Student Research Accomplishment with Distinction
1st University in Vietnam

EXPERIENCE

Vector Institute, Canada *01/2024 - 04/2024*
Research Intern – Robustness and Distribution Shift in Medical Imaging

- Investigated ensemble- and prototype-based methods for detecting subpopulation shift in medical data
- Collaborated with researchers at University of Toronto on out-of-distribution generalization strategies
- Part of the project underlying our accepted ICML 2025 paper

Supervisor: Dr. Rahul G. Krishnan, Dr. Parvin Mousavi

University of British Columbia, Canada *09/2020 – 08/2025*
Research and Teaching Assistant at Robotics and Control Laboratory

- **Research:** Computer-Aided Diagnosis for Prostate Cancer Detection in Ultrasound Imaging
  Supervisors: Dr. Purang Abolmaesumi, Dr. Parvin Mousavi
- **Teaching:** System Software Engineering; Introduction to Computation in Engineering Design

Konkuk University Hospital, South Korea *06/2020 - 09/2020*
Researcher

- Acute Ischemic Stroke Diagnosis/Prognosis using Magnetic Resonance Angiography
- Design a software for collateral analysis in acute ischemic stroke
  Supervisor: Dr. Hong Gee Roh, Dr. Jin Tae Kwak

University of British Columbia, Canada *01/2019 - 03/2019*
Visiting Researcher at Robotics and Control Laboratory

- Improved Artificial Intelligence System for Real-time Detection and Diagnosis of Prostate Cancer
  Supervisor: Dr. Jin Tae Kwak, Dr. Purang Abolmaesumi

Sejong University, South Korea *03/2017 - 05/2020*
Research Assistant at Quantitative Imaging & Informatics Laboratory

- Computer-aided system for Prostate Cancer Diagnosis using Deep Learning
- Collateral Status Assessment of Acute Ischemic Stroke in MRI using Deep Regression Network
- Tissue image analysis via multi-parametric MRI
  Supervisor: Dr. Jin Tae Kwak

Research Reviewer *2017 - Now*

Conferences, Journals

· CVPR - Computer Vision and Pattern Recognition
· MICCAI - Medical Image Computing and Computer Assisted Intervention
· ISBI - IEEE International Symposium on Biomedical Imaging
· TPAMI - IEEE Transactions on Pattern Analysis and Machine Intelligence

HIGHLIGHTED RESEARCH

1. **ICML'25** [Paper, Code] **To MN**, et al. *Diverse Prototypical Ensembles Improve Robustness to Subpopulation Shift.* (Acceptance Rate: **26.9%**). Proposes a novel prototype-based ensemble for improving fairness and generalization under subpopulation shifts.

2. **CVPR Workshops'24** [Paper] Fooladgar F, **To MN**, et al. *Manifold DivideMix: A Semi-Supervised Contrastive Learning Framework for Severe Label Noise.* Combines self-supervised embeddings with KNN filtering and manifold mixup to improve robustness under in- and out-of-distribution label noise.

3. **MICCAI'24** [Paper, Code] Wilson P.F.R., **To MN**, et al. *ProstNFound: Integrating Foundation Models with Ultrasound Domain Knowledge and Clinical Context for Robust Prostate Cancer Detection.* (Oral; Acceptance Rate: **30%**; **Young Scientist Award – Top 8 Paper**). Combines medical foundation models with ultrasound-specific priors and clinical prompts to achieve radiologist-level prostate cancer detection on micro-ultrasound data.

SELECTED JOURNAL PUBLICATIONS

1. **IJCARS'24** [Paper]: **To MN***, Fooladgar F, Wilson P, Harmanani M, Gilany M, Sojoudi S, Jamzad A, Chang S, Black P, Mousavi P, Abolmaesumi P. LensePro: Label noise-tolerant prototype-based network for improving cancer detection in prostate ultrasound with limited annotations. **International Journal of Computer Assisted Radiology and Surgery**. 2024 Jun;19(6):1121-8.. 2022 May;17(5):841-7.

2. **ER'22**: **To MN***, Kwak JT. Biparametric MR signal characteristics can predict histopathological measures of prostate cancer. **European Radiology**. 2022 May 4:1-2. (impact factor **7.043**)

3. **IJCARS'22** [Paper]: **To MN***, Fooladgar F, Javadi G, Bayat S, Sojoudi S, Hurtado A, Chang S, Black P, Mousavi P, Abolmaesumi P. Coarse label refinement for improving prostate cancer detection in ultrasound imaging. **International Journal of Computer Assisted Radiology and Surgery**. 2022 May;17(5):841-7. (impact factor **3.421**)

SELECTED CONFERENCE PROCEEDINGS

1. **ICCV'25**:Vaseli H., Wu V., Kondori N., **To MN**, Fung A., Gu A., Abolmaesumi P. HAPPI: Hyperbolic Hierarchical Prototypes for Image Recognition. (Submitted)

2. **ISBI'22** [Paper]: Fooladgar F, **To MN**, Javadi G, Samadi S, Bayat S, Sojoudi S, Eshumani W, Hurtado A, Chang S, Black P, Mousavi P. Uncertainty-Aware Deep Ensemble Model For Targeted Ultrasound-Guided Prostate Biopsy. In **2022 IEEE 19th International Symposium on Biomedical Imaging** (ISBI) 2022 Mar 28 (pp. 1-5). IEEE.

3. **ISBI'20** [Paper]: **To MN***, Sankineni S, Xu S, Turkbey B, Choyke PL, Pinto PA, Moreno V, Merino M, Wood BJ, Kwak JT. Deep Learning Framework for Epithelium Density Estimation in Prostate Multi-Parametric Magnetic Resonance Imaging. In **2020 IEEE 17th International Symposium on Biomedical Imaging** (ISBI) 2020 Apr 3 (pp. 438-441). IEEE.

PRESENTATIONS

1. **IPCAI'24**: **To MN***, Fooladgar F, Wilson P, Harmanani M, Gilany M, Jamzad A, Chang S, Black P, Mousavi P, Abolmaesumi P. LensePro: Label noise-tolerant prototype-based network for improving cancer detection in prostate ultrasound with limited annotations, ***13th Information Processing in Computer-Assisted Interventions***, June, 2024.

2. **IPCAI'22** (Oral presentation): **To MN***, Fooladgar F, Javadi G, Bayat S, Sojoudi S, Hurtado A, Chang S, Black P, Mousavi P, Abolmaesumi P. Increasing Diagnostic Yield of Prostate Cancer During Ultrasound Guided Biopsy in the Presence of Label Noise, ***13th Information Processing in Computer-Assisted Interventions***, June 7-8, 2022.

3. **MICCAI'20** (Oral presentation): **To MN***, Sankineni S, Xu S, Turkbey B, Pinto P, Moreno V, Merino M, Wood B, Kwak JT. Improving dense pixelwise prediction of epithelial density using unsupervised data augmentation for

consistency regularization, ***Medical Image Computing and Computer Assisted Intervention–MICCAI 2020: 23rd International Conference***, October 4-8, 2020.

PATENTS

1. Kwak JT, **To MN**, Kim HJ, ROH HG, inventors; Industry Academic Cooperation Foundation of Catholic University of Korea, Industry Academic Collaboration Foundation of Konkuk University Glocal, assignee. Learning method for generating multiphase collateral image and multiphase collateral image generating method using maching learning. **United States patent application US** 17/483,711. 2022 Jan 13. [Link]

AWARDS

Machine Learning in CAI Award: Runner Up *June 2022*
13th Information Processing and Computer-Aided Interventions, Tokyo, Japan

Graduate Support Initiative Award *2021 - 2023*
University of British Columbia, Canada

Graduate Research Fellowship *2017 - 2019*
Sejong University, South Korea

Student Research Accomplishment with Distinction (Annual Award) *2012*
Vietnam National University, Ho Chi Minh - International University, Vietnam

University Entrance Examination Scholarships *2010*
Vietnam National University, Ho Chi Minh - International University, Vietnam

Third Prize in Information Technology - Student Olympic (Annual Competition) *2008*
Southern Vietnam

EXTRACURRICULAR ACTIVITIES

Table Tennis *2011 – 2021*
President, Table Tennis Club, International University *2011 – 2014*
Vice President, Table Tennis Club, Sejong University *2017 – 2019*
Winner of multiple gold and silver medals in international student tournaments

Chess *2007 – 2010*
Secondary School Team Representative
Gold medalist (Team Event), City-Level Championship

SKILLS

Programming Languages	Python, C/C++, MATLAB, C#, HTML
Deep Learning Frameworks	PyTorch, Torch Geometric, Keras, MXNet
Libraries	NumPy, SciPy, scikit-learn, OpenCV, pandas, Matplotlib
Tools	Git, SLURM, Docker, LaTeX
Languages	English (TOEFL: 101/120 – R29, L27, S21, W24)