Minh Pham

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RESEARCH INTERESTS

Machine Learning, Domain Adaptation, One-shot Learning, Speaker Verification

EDUCATION

Worcester Polytechnic Institute   Exp. May, 2021

Overall GPA: 3.58

B.S. in Mathematical Sciences, Major GPA: 3.72

B.S. in Computer Science , Major GPA: 3.71

Selected Coursework: Deep Learning, Computer Vision, Artificial Intelligence, Data Analytics, Machine Learning, Software Engineering, Algorithms, Database Systems, Object-Oriented Design Concepts

PUBLICATIONS

Conference

[1] **Pham, M.**, Li, Z. and Whitehill, J. "Toward Speaker Embeddings: Automated Collection of Speech Samples from Unknown Distinct Speakers". *IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), 2020* PDF

[2] **Pham, M.**, Li, Z. and Whitehill, J. "How Does Label Noise Affect the Quality of Speaker Embeddings?". *Conference of the International Speech Communication Association (**INTERSPEECH**), 2020* PDF

Under review/preparation

[1] Ramakrishnan, A., **Pham, M.** and Whitehill, J. "Harnessing Geometric Constraints from Auxiliary Labels to Improve Embedding Functions for One-Shot Learning". *Association for the Advancement of Artificial Intelligence Conference (**AAAI**), 2020 - under review*

[2] Lin, X., **Pham, M.** and Rundensteiner, E. "Efficient Sequential Rule Mining in Parameter Space". *International Conference on Very Large Data Bases (**VLDB**), 2020 - under preparation*

EXPERIENCE

Research Assistant, WPI, Speaker Embeddings   May, 2019 - Present

Supervised by Prof. Jacob Whitehill.

- Designed a paradigm to bootstrap large-scale collection of speech samples from unique speakers by using pre-trained speaker and face embedding models; published the BookTubeSpeech dataset containing video and speech of 8,455 unique speakers.
- Studied how label noise affects the accuracy of downstream embedding models for speaker verification.
- Explored different domain adaptation strategies for room acoustics adaptaion for speaker verification.
- Examined how to improve speaker embeddings by introducing different geometric constraints on the embedding space learnt by a deep learning model by using the dataset's available meta information.

Research Assistant, WPI, Sequential Rule Mining & Emotion Detection   Feb, 2019 - Aug, 2020

Supervised by Prof. Elke A. Rundensteiner

- Implemented ERMiner algorithm for sequential rule mining from research paper in C++.
- Integrated the algorithm into WPI PARAS system - a framework that supports interactive association mining at near real-time speeds; added support for interactive sequential rule mining and incorporated multi-threading functionality for data preprocessing.
- Explored different transfer learning strategies for emotion detection when limited training data are available; implemented different CNN architectures for emotion classification based on speech.

Research Intern, VinAI Research, Low-Resource Speech Recognition   Jun, 2020 - Aug, 2020
Supervised by Dr. Viet Anh TRAN.
- Conducted research on automatic speech recognition (ASR) for Vietnamese when very limited training data is available.
- Trained monolingual and multilingual ASR models for German, Spanish, and English.
- Researched how unsupervised pre-training on unlabeled audio data of multiple languages affect acoustic model training.

PROJECTS FOR ACADEMIC CREDITS

Senior Thesis

Deep Adversarial Canonical Correlation Analysis, WPI   Sep, 2020 - Present
Supervised by Prof. Randy C. Paffenroth and Prof. Jacob Whitehill
- Conducted research on a method to generate realistic paired data samples when limited data are available for training.

Independent Study

Corrosion Resistance, WPI (sponsored by Army Research Laboratory)   Jan, 2020 - May, 2020
Supervised by Prof. Fatemeh Emdad, Prof. Chun-Kit Ngan, and Prof. Elke A. Rundensteiner
- Developed a mobile application that assists users in data collection from corrosion experiments.
- Built dashboard to help users study material deterioration and identify failed observations.

NFL Player Projections, WPI (sponsored by DraftKings)   Aug, 2019 - Mar, 2020
Supervised by Prof. Randy C. Paffenroth, Prof. Donald R. Brown, and Prof. Ziming Zhang
- Performed exploratory data analysis and feature engineering on NFL players' statistics; used Random Forest to improve DraftKings baseline performance by ~10%.
- Researched how to utilize a Generative Adversarial Network to generate synthetic statistics for NFL players.

ACTIVITIES & AWARDS

Member, The Institute of Electrical and Electronics Engineers (IEEE)   Nov, 2019 - Present
Member, American Mathematical Society (AMS)   Nov, 2019 - Present
First Prize, WPI Diversity Collaboration Hackathon   Oct, 2019
Poster Presentation, WPI Works in Progress Undergraduate Research Symposium   Oct, 2019
WPI University Award & International Scholarship   2017 - 2021

SKILLS

Programming Python, Java, C++, SQL, R

Technologies PyTorch, Tensorflow, Google Cloud, AWS, Git, Slurm

Certificates Deep Learning Specialization *(Coursera)*, Tensorflow in Practice Specialization *(Coursera)*, Machine Learning *(DataCamp)*