Zifeng Wang

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EDUCATION

Northeastern University Boston, MA

PhD Candidate in Computer Engineering, GPA: 4.0 / 4.0 Sep 2018 – May 2023 (expected)

- With a focus on various topics in Machine Learning, especially *Continual (Lifelong) Learning*.

Tsinghua University Beijing, China

Bachelor of Engineering in Electronic Engineering, GPA: 92 / 100 July 2018

- Ranked in top 5% of 233 students.

WORK EXPERIENCE

Cloud AI Research, Google Remote / Sunnyvale, CA

Research Intern; Hosted by: Zizhao Zhang, Chen-Yu Lee June 2021 – May 2022

- Led the research topic: *Prompting for Continual Learning* (CL).
- Collaborated and led weekly discussion with a team of 8 full-time employees across multiple teams.
- Developed a complex continual learning framework in JAX.
- Proposed two novel CL methods: *Learning to Prompt (L2P)*, where the backbone model is prompted dynamically to solve tasks sequentially. *DualPrompt* further improves upon L2P by human-learning inspired complementary prompting system. Both methods are pioneer works that bring prompting into the field of CL and achieve state-of-the-art performance on multiple benchmarks.
- Research impact: L2P and DualPrompt are published at CVPR22 and ECCV22, respectively.
- Product impact: L2P leads to significant improvement in DocumentAI sequential learning tasks.

Research Intern; Hosted by: Zizhao Zhang, Vincent Perot May 2022 – Present

- Led the research topic: *Universal Document Understanding*.
- Developing novel methods for data-efficient and zero-shot learning on both research and production-level document named entity extraction (NER) benchmarks.

ACADEMIC EXPERIENCE

Machine Learning Group, Northeastern University Boston, MA

Research Assistant; Advised by: Prof. Jennifer Dy, Prof. Stratis Ioannidis Sep 2018 – Present

- Led research topics of *continual learning*, adversarial robustness and model compression, proposed and implemented novel deep learning algorithms in PyTorch and TensorFlow.
- Contributed to the development of *Radiofrequency Machine Learning System*, a software library for massive scale (10k+ classes, 7TB data) radiofrequency signal classification.
- Published papers in top-tier AI conferences (CVPR, NeurIPS, ECCV, ICDM, etc.).
- Involved in different research subgroups, presented and communicated with colleagues weekly.
- Analyzed and preprocessed data from different domains.

Channing Laboratory, Harvard Medical School Boston, MA

Collaborator; Advised by: Dr. Peter J. Castaldi, Prof. Jennifer Dy Sep 2018 – Present

- Developed a novel deep learning model which combines biological domain knowledge for patients' smoking status prediction using RNAseq data, achieved state-of-the-art accuracy and better interpretability.
- Led the writing of a journal paper, accepted by PLOS Computational Biology.
- Collaborated with doctors and presented results to researchers with biology backgrounds.

i-Vision Group, Tsinghua University — Beijing, China

Undergrad Research Assistant; Advised by: Prof. Jiwen Lu — Sep 2017 – Mar 2018

- Implemented a novel algorithm to track multiple people in video clips using a deep reinforcement learning based approach with state-of-the-art performance, coauthored a paper published in ECCV18.
- Helped conduct experiments with competing methods and did comprehensive literature review.

Vision & Learning Lab, University of Michigan — Ann Arbor, Michigan

Visiting Student; Advised by Prof. Jia Deng — July 2017 – Sep 2017

- Implemented the End-to-End Hourglass model, a deep learning model for instance segmentation problem in computer vision, achieved state-of-the-art results on MSCOCO dataset.
- Contributed to refactoring and optimization of the codebase with multiple collaborators, improved the performance by 8% in mean average precision and 80% in running speed.

AWARDS

Best Paper Candidate, ICDM 2020 — Sorrento, Italy

Best Paper Award, IEEE DySPAN 2019 — Newark, NJ

Dean's Fellowship, Northeastern University, 2018 — Boston, MA

Outstanding Undergraduate Scholarship, Tsinghua University, 2016 — Beijing, China

SELECTED PUBLICATIONS

Conference Papers

- **Zifeng Wang**, Zizhao Zhang, Sayna Ebrahimi, Ruoxi Sun, Han Zhang, Chen-Yu Lee, Xiaoqi Ren, Guolong Su, Vincent Perot, Jennifer Dy, Tomas Pfister. "DualPrompt: Complementary Prompting for Rehearsal-free Continual Learning". ECCV 2022.
- **Zifeng Wang**, Zizhao Zhang, Chen-Yu Lee, Han Zhang, Ruoxi Sun, Xiaoqi Ren, Guolong Su, Vincent Perot, Jennifer Dy, Tomas Pfister. "Learning to Prompt for Continual Learning". CVPR 2022.
- **Zifeng Wang**, Tong Jian, Aria Masoomi, Stratis Ioannidis and Jennifer Dy. "Revisiting Hilbert-Schmidt Information Bottleneck for Adversarial Robustness". NeurIPS 2021.
- **Zifeng Wang***, Tong Jian*, Kaushik Chowdhury, Yanzhi Wang, Jennifer Dy, and Stratis Ioannidis. "Learn-Prune-Share for Lifelong Learning". ICDM 2020.
- **Zifeng Wang**, Batool Salehi, Andrey Gritsenko, Kaushik Chowdhury, Stratis Ioannidis, and Jennifer Dy. "Open-World Class Discovery with Kernel Networks". ICDM 2020. **Best Paper Candidate**.
- Aria Masoomi, Chieh Wu, Tingting Zhao, **Zifeng Wang**, Peter Castaldi, Jennifer Dy. "Instance-wise Feature Grouping". NeurIPS 2020.
- Andrey Gritsenko*, **Zifeng Wang***, Jennifer Dy, Kaushik Chowdhury, and Stratis Ioannidis. "Finding a 'New' Needle in the Haystack: Unseen Radio Detection in Large Populations Using Deep Learning". DySPAN 2019, **Best Paper Award**.
- Liangliang Ren, Jiwen Lu, **Zifeng Wang**, et al. "Collaborative Deep Reinforcement Learning for Multi-Object Tracking". ECCV 2018.

Journal Papers

- Tingting Zhao*, **Zifeng Wang***, Aria Masoomi, Jennifer Dy. "Deep Bayesian Unsupervised Lifelong Learning". Neural Networks 149, 95-106.
- **Zifeng Wang**, Aria Masoomi, et al. "Improved Prediction of Smoking Status via Isoform-Aware RNAseq Deep Learning Models". PLoS computational biology 17 (10), e1009433.
- Tong Jian, Bruno Rendon, Emmanuel Ojuba, Nasim Soltani, **Zifeng Wang**, et al. "Deep Learning for RF Fingerprinting: A Massive Experimental Study". IEEE Internet of Things Magazine 3 (1), 50-57.

SKILLS

- Research: Machine Learning, Computer Vision, AI in Healthcare, AI in Communications.
- Software: PyTorch, JAX, TensorFlow, scikit-learn, Apache Spark, Apache Hadoop.
- Programming Languages: Python, C/C++, JAVA, MATLAB.