

Yueh-Hua Wu

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EDUCATION

University of California San Diego, California, USA

Sept. 2020 - PRESENT

Ph.D. in Computer Science and Engineering

Advisor: Xiaolong Wang

National Taiwan University (NTU), Taipei, Taiwan

Sept. 2017 - June. 2020

Master of Science in Computer Science and Information Engineering

National Taiwan University (NTU), Taipei, Taiwan

Sept. 2013 - Jun. 2017

Bachelor of Science in Electrical Engineering

RESEARCH INTERESTS

My research interest is to enable **reinforcement learning** and **imitation learning** to be practical and robust enough for real-world decision-making problems by considering the imperfectness in data and costly sampling conditions.

PUBLICATIONS

- Yuzhe Qin*, **Yueh-Hua Wu***, Shaowei Liu*, Hanwen Jiang*, Ruihan Yang, Yang Fu, and Xiaolong Wang, "DexMV: Imitation Learning for Dexterous Manipulation from Human Videos", 2021
- **Yueh-Hua Wu**, I-Hau Yeh, David Hu, and Hong-Yuan Mark Liao, "Batch-Augmented Multi-Agent Reinforcement Learning for Efficient Traffic Signal Optimization", *Preprint arXiv:2005.09624*, 2020
- Chien-Yao Wang, Hong-Yuan Mark Liao, I-Hau Yeh, **Yueh-Hua Wu**, Ping-Yang Chen, and Jun-Wei Hsieh, "CSPNet: A New Backbone that can Enhance Learning Capability of CNN", *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2020
- **Yueh-Hua Wu***, Ting-Han Fan*, Peter J. Ramadge, and Hao Su, "Model Imitation for Model-Based Reinforcement Learning", *Preprint arXiv:1909.11821*, 2019
- **Yueh-Hua Wu**, Nontawat Charoenphakdee, Han Bao, Voot Tangkaratt, and Masashi Sugiyama, "Imitation Learning from Imperfect Demonstration", *In Proceedings of the 36th International Conference on Machine Learning (ICML)*, 2019 (**Oral**)
- Fan-Yun Sun, Yen-Yu Chang, **Yueh-Hua Wu**, and Shou-De Lin, "A Regulation Enforcement Solution for Multi-agent Reinforcement Learning", *In Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2019
- **Yueh-Hua Wu**, Fan-Yun Sun, Yen-Yu Chang, and Shou-De Lin, "ANS: Adaptive Network Scaling for Deep Rectifier Reinforcement Learning Models", *Preprint arXiv:1809.02112*, 2018
- Yen-Yu Chang, Fan-Yun Sun, **Yueh-Hua Wu**, and Shou-De Lin, "A Memory-Network Based Solution for Multivariate Time-Series Forecasting", *Preprint arXiv:1809.02105*, 2018
- **Yueh-Hua Wu** and Shou-De Lin, "A Low-Cost Ethics Shaping Approach for Designing Reinforcement Learning Agents", *In Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI)*, Feb. 2018 (**Oral**)
- Fan-Yun Sun, Yen-Yu Chang, **Yueh-Hua Wu**, and Shou-De Lin, "Designing Non-greedy Reinforcement Learning Agents with Diminishing Reward Shaping", *In Proceedings of the 1st AAAI/ACM conference on Artificial Intelligence, Ethics, and Society (AIES)*, Feb. 2018 (**Oral**)

- Shu-Kai Chang, Sui-Tsung Go, **Yueh-Hua Wu**, Yen-Ting Lee, Chien-Lin Lai, Sz-Han Yu, Chun-Wei Chen, Huan-Yuan Chen, Ming-Feng Tsai, Mi-Yen Yeh, and Shou-De Lin, "An Ensemble of Ranking Strategies for Static Rank Prediction in a Large Heterogeneous Graph", *2016 WSDM Cup (Winner Report)*
- Chin-Chi Hsu, Kuan-Hou Chan, Ming-Han Feng, **Yueh-Hua Wu**, Huan-Yuan Chen, Sz-Han Yu, Chun-Wei Chen, Ming-Feng Tsai, Mi-Yen Yeh, and Shou-De Lin, "Time-Aware Weighted PageRank for Paper Ranking in Academic Graphs", *2016 WSDM Cup (Winner Report)*

AWARDS & HONORS

- Winner, ACM WSDM Cup 2016
- Student Scholarship, Ministry of Education, Taiwan *Sep. 2017 - Jan. 2019*
- Outstanding Students Scholarship, Tainan City United Workers Association *Sep. 2013*

RESEARCH EXPERIENCES

Academia Sinica

Jul. 2019 - Jun. 2020

Research Assistant

Advisor: Mark Liao, Distinguished Research Fellow at Academia Sinica

*Research Project: **Batch Reinforcement Learning for Adaptive Traffic Signal Control***

- Proposed an RL method that optimized traffic signal control policies coherently with data collected from multiple intersections.

University of California San Diego

Jul. 2019 - Oct. 2019

Visiting Scholar

Advisor: Hao Su, Assistant Professor at University of California San Diego

*Research Project: **Model Imitation for Model-Based Reinforcement Learning***

- Proposed to incorporate matching between the distributions of rollouts from the synthesized environment and the real one
- Provided theoretical results that the difference in cumulative reward between the synthesized environment and the real one can be bounded and optimized by enforcing distribution matching.

RIKEN Center for Advanced Intelligence Project

Jul. 2018 - Jan. 2019

Research Intern

Advisor: Masashi Sugiyama, Director of RIKEN Center for Advanced Intelligence Project

*Research Project: **Imitation Learning from Imperfect Demonstration***

- Proposed two methods that learn from imperfect demonstration partially equipped with confidence scores
- Provided theoretical guarantees to the estimation error bound of the discriminator and the proposed risk and the optimality of the learned policy.

NTU - Machine Discovery and Social Network Mining Lab

Feb. 2015 - Jun. 2020

Undergrad. (before Jul. 2017) / Master (after Jul. 2017)

Advisor: Shou-De Lin, Professor at National Taiwan University

*Research Project: **Robust Reinforcement Learning***

- Developed general reinforcement learning frameworks to make the learning process faster and to make the performance more robust with respect to hyper-parameters.
- Incorporated reinforcement learning with hyper-parameter optimization (e.g., bayesian optimization) and adaptive tuning approaches so that reinforcement learning models perform consistently well without much human efforts.

*Research Project: **Ethical Decision Making***

- Proposed a high-level framework to train an ethical RL agent based on a regular reward function together with certain human data optimizing diverse objectives.
- Designed the ethics shaping model to adjust the reward function through the interaction between the RL and human policy.
- Coined three scenarios *Grab a Milk*, *Driving and Avoiding*, and *Driving and Rescuing* to show how ethics shaping balances ethical behavior and performance pursuit.

NTU - Department of Electrical Engineering

Sep. 2013 - Oct. 2017

Research Assistant

Advisor: Prof. Jian-Jiun Ding, Department of Electrical Engineering

*Research Project: **Singular Value Decomposition for Fast Compressive Sensing***

- Proposed a signal-dependent framework to select suitable atoms with upper error bound for l_1 -norm minimization.
- Deployed singular value decomposition to approximate the atom dictionary used for compressive sensing.

WORK EXPERIENCES

DeepHow

Feb. 2019 - Jun. 2019

Research Intern

Advisor: Samuel Zheng

*Research Project: **Hierarchical Imitation Learning with Various Granularities***

- Considered multilayer hierarchy in real-world policies and proposed an unsupervised learning approach to retrieve such information from the given demonstration.

Groundhog Technologies Inc.

Apr. 2016 - Dec. 2017

Data Scientist Intern

*Research Project: **Real-Time Bidding Machine***

- Transformed images and keywords of advertisements to informative features with Word2vec and semi-supervised dimensionality reduction.
- Designed an ensemble model that took input from Neural Net models and factorization machines.