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 lies in exploring **reinforcement learning** and **robotics** for real-world decision-making problems such as object manipulation by considering the imperfectness of data and costly sampling conditions.

PUBLICATIONS

- **Yueh-Hua Wu***, Jiashun Wang*, and Xiaolong Wang, "Learning Generalizable Dexterous Manipulation from Human Grasp Affordance", *In Proceedings of the Conference on Robot Learning (**CoRL**), 2022*
- 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", *In Proceedings of the European Conference on Computer Vision (**ECCV**), 2022*
- 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** 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**)

AWARDS & HONORS

- J. Yang Scholarship, UC San Diego Institute of Engineering in Medicine *2020 - 2021*
- Student Scholarship, Ministry of Education, Taiwan *Sep. 2017 - Jan. 2019*
- Winner, ACM WSDM Cup *2016*

RESEARCH EXPERIENCES

Sony *Jun. 2022 - Sep. 2022*
Research Intern
Advisor: Hirotaka Suzuki, Team Leader at Sony
Research Project: **Better-than-demonstrator Policy Learning for Deformable Objects Manipulation**
- Proposed a multi-agent RL algorithm that improves Transporter to learn cooperative policies outperforming the demonstrator in an offline fashion without additional information.

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.