Iou-Jen Liu

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Objective

Research Intern, Summer 2021

Education

University of Illinois at Urbana-Champaign, IL, U.S.A.
PhD, Electrical and Computer Engineering   2021 (Expected)
Master of Science, Mathematics   2021 (Expected)
Advisor: Prof. Alexander Schwing

National Taiwan University, Taipei, Taiwan
Master of Science, Electrical Engineering   2014
Bachelor of Science, Electrical Engineering   2012
Advisor: Prof. Yao-Wen Chang

Research Interests

Deep Reinforcement Learning, Multi-Agent System, Parallel Computing

Publications

8. **Iou-Jen Liu**, Raymond A. Yeh, Alexander G. Schwing, "High-Throughput Synchronous Deep Reinforcement Learning", in Neural Information Processing Systems (**NeurIPS**), 2020

7. **Iou-Jen Liu***, Raymond A. Yeh*, Alexander G. Schwing, "PIC: Permutation Invariant Critic for Multi-Agent Deep Reinforcement Learning", in Conference on Robot Learning (**CORL**), 2019 (**Spotlight**)

6. Youjie Li, **Iou-Jen Liu**, Deming Chen, Alexander G. Schwing, Jian Huang, "Accelerating Distributed Reinforcement Learning with In-Switch Computing", in ACM/IEEE International Symposium on Computer Architecture (**ISCA**), 2019 (**Oral**)

5. **Iou-Jen Liu**, Jian Peng, Alexander G. Schwing, "Knowledge Flow: Improve upon Your Teachers", in International Conference on Learning Representations (**ICLR**), 2019

4. **Iou-Jen Liu**, Shao-Yun Fang, Yao-Wen Chang, "Overlay-Aware Detailed Routing for Self-Aligned Double Patterning Lithography Using the Cut Process", in IEEE Transactions on CAD (**TCAD**), Vol. 35, 2016

3. **Iou-Jen Liu**, Shao-Yun Fang, Yao-Wen Chang, "Stitch-Aware Routing for Multiple E-Beam Lithography", in IEEE Transactions on CAD (**TCAD**), Vol. 34, 2015

2. **Iou-Jen Liu**, Shao-Yun Fang, Yao-Wen Chang, "Overlay-Aware Detailed Routing for Self-Aligned Double Patterning Lithography Using the Cut Process", in ACM/IEEE Design Automation Conference (**DAC**), 2014 (**Oral**)

1. Shao-Yun Fang, **Iou-Jen Liu**, Yao-Wen Chang, "Stitch-Aware Routing for Multiple E-Beam Lithography", in ACM/IEEE Design Automation Conference (**DAC**), 2013 (**Oral**)

Selected Awards

- **Graduate Student Fellowship**, University of Illinois, 2020
- **Third Place**, ACM/IEEE ICCAD Programming Contest, 2012
- **Best Master Thesis Award**, Taiwan IC Design Society, 2014
- **Teachers Ranked as Excellent**, University of Illinois, Spring'17, Spring'18, Fall'18, Spring'19, Fall'19
  Average student rating higher than 4.3 (out of 5.0)
- **ICLR Travel Award**, 2019
- **Graduate Scholarship**, National Taiwan University, 2014
  Top 10% student in one academic year

Work History

University of Illinois at Urbana-Champaign (2018 - present)
Research Assistatnt
Advisor: Professor Alexander Schwing

- **Permutation Invariant Critic (PIC) for MARL** studies the ordering issue in centralized MARL. PIC significantly improves the sample efficiency over baseline MARL method, and scales to 200 agents. (CORL'19)

- **Coordinated Exploration for MARL** allows agent to share sub-goals and explore the environment in a coordinated manner, which achieves better performance than conventional entropy or noise-based exploration.
- **Knowledge Flow** transfers knowledge from multiple (pre-trained) teacher models to a student model. Student trained with knowledge flow achieves top results in both supervised learning and RL tasks. (ICLR'19)

University of Illinois at Urbana-Champaign (2017 - present)
Teaching Assistant (Head TA)
ECE220 - Computer System and Programming
- Teach weekly lab sections on C/C++.
- Maintain online grading system (PrairieLearn) for machine-based tests.

D-wave Systems (2017)
Machine Learning Research Intern
- Work on DCGAN with RBM, where sampling steps could be performed on D-wave quantum computers.

SKILLS

- Programming Languages: Python, C, C++, CUDA, Matlab
- Deep Learning Platform: Pytorch, Tensorflow

COURSE WORKS

- Statistical Reinforcement Learning, Computer Vision, Pattern Recognition
- Real Analysis, Random Processes, General Topology, Abstract Linear Algebra, Nonlinear Programming