Ting-Han Fan

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EDUCATION

Princeton University, Princeton, New Jersey, United States *Sept. 2018 - Jun. 2023 (expected)*
PhD Student in Electrical and Computer Engineering Advisor: Peter J. Ramadge

- Cumulative GPA: 3.94/4.0 • MA degree in Electrical Engineering on 09/26/2020
- **Positinal Embeddings for Natural Language Processing:** Generalizes the relative position embedding of transformers using CPD kernels, with a strong performance in length extrapolation [1].
- **Reparameterization for Discrete Deep Generative Models:** Develop a reparameterization method for training discrete deep generative models, enabling variance reduction without resampling [2].
- **Reinforcement Learning:** Analyze the error of off-policy actor-critic algorithm. Analyze the error in the model-based setting and show that branched rollouts reduce this error [5].

National Taiwan University, Taipei, Taiwan *Sept. 2013 - Jun. 2017*
Bachelor of Science in Electrical Engineering

- Cumulative GPA: 4.14/4.3 • Dean's List Award: 2 times.

WORK EXPERIENCE

Private Strats team, Asset Management Division, Goldman Sachs *Jun. 2022 - Aug. 2022*
Summer Associate Manager: Xiaomeng Zhang

- **Financial News Parsing:** Web-scrape the news articles. Develop parsing models by regular expression and question-answering NLP models. Integrate the result into the database using fuzzy matching.

Autonomous Systems Research Group, Siemens Technology *Jun. 2021 - Aug. 2021*
Research Intern Manager: Yubo Wang

- **Reinforcement Learning for Power Distribution Systems:** Develop a reinforcement learning environment for power distribution systems [3]. The environment is developed from scratch and has been open-source. Design an integer reparameterization model for the Soft Actor-Critic algorithm [4]. Two US patent applications are under review based on [3] and [4].

Office of the Chief Economist, Microsoft Research *Jun. 2020 - Aug. 2020*
Research Intern Manager: Chien-Hsun Huang

- **Eviction Rate Prediction for Azure Spot Virtual Machines:** Generate training features from high-volume tables using Pandas and Numpy. Implement machine learning models to predict eviction rates of spot VMs and design regularizations to enhance model interpretability.

SKILLS

- Programming: Python, C++. • Machine Learning Tools: PyTorch, Keras, Scikit-Learn, Numpy, Pandas.

PUBLICATIONS

[1] Ta-Chung Chi*, **Ting-Han Fan***, Peter J. Ramadge, and Alexander I. Rudnicky, "KERPLE: Kernelized Relative Positional Embedding for Length Extrapolation," NeurIPS 2022.

[2] **Ting-Han Fan***, Ta-Chung Chi*, Alexander I. Rudnicky, and Peter J. Ramadge, "Training Discrete Deep Generative Models via Gapped Straight-Through Estimator," ICML 2022.

[3] **Ting-Han Fan**, Xian Yeow Lee, and Yubo Wang, "PowerGym: A Reinforcement Learning Environment for Volt-Var Control in Power Distribution Systems," Learning for Dynamics and Control (L4DC) 2022.

[4] **Ting-Han Fan** and Yubo Wang, "Soft Actor-Critic With Integer Actions," American Control Conference (ACC) 2022.

[5] **Ting-Han Fan** and Peter J. Ramadge, "A Contraction Approach to Model-based Reinforcement Learning," the 24th International Conference on Artificial Intelligence and Statistics (AISTATS) 2021.

[6] **Ting-Han Fan** and I-Hsiang Wang, "Rumor Source Detection: A Probabilistic Perspective," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2018.

* Equal contribution.