FRANK SHIH

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SUMMARY

Postdoctoral Research Scholar with expertise in **machine learning, reinforcement learning, and uncertainty quantification**. Experienced in developing scalable algorithms, publishing in top ML venues (ICLR, NeurIPS, TMLR), and collaborating across interdisciplinary teams. Proficient in Python and PyTorch, with strong background in **Bayesian statistics, stochastic optimization**, and applications to scientific computing. Seeking to translate cutting-edge research into impactful real-world solutions in industry.

TECHNICAL SKILLS

Programming: Python (advanced), PyTorch (advanced), R, MATLAB, Git, SLURM/Bash
Expertise: Reinforcement Learning, Deep Learning, Bayesian Statistics, Stochastic Gradient MCMC, Uncertainty Quantification, Statistical Modeling

EXPERIENCE

Postdoctoral Research Scholar, Memorial Sloan Kettering Cancer Center Sep 2025 – Present
New York, NY

Conduct research on **uncertainty quantification for deep learning models**, focusing on scalable algorithms for reinforcement learning and scientific computing.

Collaborate with statisticians, computer scientists, and clinicians to translate statistical innovations into biomedical applications, including microbiome studies and CAR-T therapy.

- Lead projects on extending fiducial inference and stochastic gradient MCMC methods to improve reliability and interpretability of complex deep learning models.

Researcher / PhD Candidate, Purdue University Aug 2019 – Aug 2025
West Lafayette, IN

Developed scalable **Stochastic Gradient MCMC** algorithms for Deep RL, achieving near-theoretical 95% confidence interval coverage in Q-values.

Published first-author work at **ICLR 2024**, introducing uncertainty-aware reinforcement learning with theoretical guarantees and empirical validation.

- Designed adaptive UQ framework for **Actor-Critic RL**, ensuring stable convergence and statistically valid confidence intervals for policy evaluation.
- Built uncertainty-aware **Physics-Informed Neural Networks (PINNs)** for PDEs (Poisson, Black-Scholes), improving interpretability and robustness in scientific computing.
- Collaborated with statisticians and clinicians on high-dimensional regression for biomarker discovery, integrating **model selection + uncertainty quantification**.

EDUCATION

Purdue University Aug 2019 – Aug 2025
Ph.D. in Statistics

National Taiwan University Aug 2015 – Jun 2018
M.S. in Applied Mathematics

National Taiwan University Aug 2011 – Jun 2015
B.S. in Mathematics

SELECTED PUBLICATIONS

Frank Shih and F. Liang. Fast value tracking for deep reinforcement learning. *ICLR*, 2024.
Frank Shih and F. Liang. Latent Trajectory: Actor-Critic RL with Uncertainty Quantification. *TMLR*, 2025.
Frank Shih, Z. Jiang, F. Liang. UQ for Physics-Informed Neural Networks with Extended Fiducial Inference. *NeurIPS*, 2025.

LINKS

LinkedIn: linkedin.com/in/frank-shih-874029193
GitHub: github.com/FrankShih0807