Xinyi Ni

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EDUCATION

University of California, Davis — Davis, CA
Ph.D. in Electrical and Computer Engineering, Advisor: Lifeng Lai.   Sept. 2019 – Expected Jun. 2024

Zhejiang University — Hangzhou, China
B.E. in Information Engineering.   Sept. 2015 - Jun. 2019
- *Honors: Dean's Distinguished Graduate Fellowship; Academic Excellence Scholarship; Provincial Outstanding Student Scholarship; Excellent Graduation Thesis*

RESEARCH EXPERIENCE

A Policy Gradient Method for ϕ-Divergence Risk Measure in Risk-Sensitive RL — Davis, CA
Paper submitted to AAAI 2024   Nov. 2022 - May 2023
- Explored the application of ϕ-divergence to construct a RL framework, which addressed risk-sensitive RL challenges while concurrently ensuring the robustness of solving risk-neutral RL problems under model uncertainties.
- Proposed a policy gradient method which exhibited applicability across the entire ϕ-divergence class, thereby providing insights into the resolution of novel risk measures proposed in future research.

Robust Risk-Sensitive RL with Conditional VaR (CVaR) — Davis, CA
Paper submitted to AAAI 2024   Mar. 2022 - Oct. 2022
- Presented a novel investigation into the robustness of risk-sensitive RL within the robust Markov decision process framework, which shaded light on the practical applicability of risk-sensitive RL in real-world scenarios.
- Introduced a novel risk measure named NCVaR and established the equivalence between NCVaR optimization and robustness of CVaR under decision-dependent uncertainty.

Policy Gradient Based Entropic-VaR Optimization in Risk-Sensitive RL — Davis, CA
Paper accepted by Allerton Conference, IEEE 2022   Aug. 2021 - Feb. 2022
- Refined the further application and methodology of Entropic-VaR in risk-sensitive RL.
- Proposed a policy gradient method to ensure convergence to a local optimal policy by utilizing multi-timescale stochastic approximation and validated the applicability of the algorithm through simulation experiments.

Risk-Sensitive Reinforcement Learning via Entropic-VaR Optimization — Davis, CA
Paper accepted by ACSSC, IEEE 2022   Sept. 2020 - Jun. 2021
- Pioneered the application of a novel risk measure called Entropic-VaR in designing robust RL algorithms within the MDP framework, marking the first-ever exploration of this approach.
- Derived a value iteration method for Entropic-VaR RL to optimize policies, ensuring convergence to a optimal policy while validating it through RL methodologies and simulation experiments.

Machine Learning Based Clinical Pathological Diagnosis of HPV — Shanghai, China
Paper rewarded as Excellent Graduation Thesis at Zhejiang University   Nov. 2018 - Jun. 2019
- Collaborated with Shanghai Tongji University Affiliated Hospital to create an auxiliary recognition system for classifying medical images depicting varying degrees of lesions.
- Employed advanced image processing and data augmentation techniques to address challenges arising from inconsistent image quality and data collection limitations, with subsequent training conducted using conventional neural networks (CNNs).

Driver Assistance System with Traffic Signs Recognition Based on ML — Hangzhou, China
Project awarded a patent in China   Mar. 2018 - Sept. 2018
- Developed a driver assistance system endowed with the capability to proficiently detect and autonomously govern vehicular operations in response to traffic signage cues.
- Employed an amalgamation of Python, TensorFlow, and OpenCV to orchestrate image preprocessing procedures, while leveraging a pre-trained Convolutional Neural Network (CNN) for the classification of visual data.

SKILLS

- Programming and Software: Python, MATLAB, C, C++, Java