Yanna Ding

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Education

▷ Rensselaer Polytechnic Institute (RPI)　　　　　　　　　　　　　　　Spring 2022 - Current
　Ph.D. program in Computer Science　　　　　　　　　　　　　　　　　　GPA: 4.0/4.0
▷ University of Toronto (UofT)　　　　　　　　　　　　　　　　　　　　　2017 - 2021
　Honours Bachelor of Science in Computer Science and Mathematics　　　　GPA: 3.92/4.0

Selected Publications

▷ Epigraph Based Multilevel Optimization (EMO) For Enhancing Chain Of Thought Reasoning Capabilities
　Lu S., Ding Y., Horesh L., Gao J, Magdon-Ismail M.　　　　ICASSP'25 (acceptance rate ~48%)
▷ Architecture-Aware Learning Curve Extrapolation via Graph Ordinary Differential Equation
　Ding Y., Huang Z., Shou X., Guo Y., Sun Y., Gao J.　　　　AAAI'25 (acceptance rate 23.4%)
▷ Inferring from Logits: Exploring Best Practices for Decoding-Free Generative Candidate Selection
　Mingyu Derek Ma, Ding Y., Huang Z., Gao J., Sun Y., Wang W.　　　　*NeurIPS ENLSP'2024*
▷ Efficient Parameter Inference in Networked Dynamical Systems via Steady States: A Surrogate Objective Function
　Approach Integrating Mean-field and Nonlinear Least Squares
　Ding Y., Gao J., Magdon-Ismail M.　　　　*Phys. Rev. E'24* (acceptance rate 20-30%)
▷ Learning Network Dynamics via Noisy Steady States
　Ding Y., Gao J., Magdon-Ismail M.　　　　ASONAM'23 (acceptance rate 36.5%)

Selected Projects

▷ DYNAMICS OF LANGUAGE MODEL TRAINING SYSTEMS　　　　IBM, Research Extern (Summer 2024)
　- Developed a theoretical framework to understand the mechanism of in-context learning for Markovian data
　- Discovered a novel interpretation of Transformers in in-context learning for Markov chains
　- Implemented a multilevel optimization framework to enhance chain-of-thought reasoning capabilities, achieving up to a 40% reduction in out-of-distribution errors compared to traditional training strategies
　⋆ *Related Skills: LLM Reasoning, Learning Theory, Multilevel Optimization*
▷ ARCHITECTURE-AWARE LEARNING CURVE EXTRAPOLATION　　　　UCLA, Visiting Student (Spring 2024)
　- Developed a novel architecture-aware neural differential equation model to predict learning curve trajectories
　- Achieved a 20x speedup in model selection with an up to 59.63% improvement in extrapolation accuracy compared to existing methods
　⋆ *Related Skills: Neural Differential Equations, Graph Neural Networks, Neural Architecture Search (NAS)*
▷ DECODING-FREE CANDIDATE SELECTION　　　　UCLA, Visiting Student (Spring 2024)
　- Introduced and evaluated novel decoding-free methods for generative candidate selection
　- Analyzed diverse datasets from QA tasks and clinical decision-making scenarios with up to 94k candidates
　- Achieved up to a 29.25-point improvement in recall for lab test orders compared to full decoding methods, while reducing runtime by up to 145x on selected tasks.
　⋆ *Related Skills: Language Model Inference, Generative Candidate Selection*
▷ REVERSE ENGINEERING NETWORKED DYNAMICAL SYSTEMS　　　RPI, Research Assistant (Spring 2022 Present)
　- Developed a surrogate objective function to infer parameters from noisy steady-state data
　- Achieved up to a 300x speed-up in runtime compared to baseline methods
　⋆ *Related Skills: Differential Equations, Network Dynamics, Optimization, Mean-field Approach*

Honours and Awards

▷ Selected as a graduation spotlight student　　　　　　　　　　　　　UofT, Spring 2021
▷ Dean's List Scholar, Faculty of Arts and Science　　　　　　　　　　UofT, 2018 - 2021
▷ Mitacs Research Training Award　　　　　　　　　　　　　　　　　UofT, Fall 2020
▷ Department of Computer Science, Undergraduate Research Award　　　　UofT, Summer 2020
▷ The Chancellor's Scholarship for high academic achievement　　　　　St. Hilda's Fund, 2019-2020
▷ Admission Scholarships　　　　　　　　　　　　　　　　　　　　UofT, Fall 2017

Service

▷ Reviewer for ICML 2022, KDD 2024

Skills

▷ Progamming Languages: Python, LaTeX C/C++, MATLAB, Java, JavaScript, and Markdown
▷ Libraries: Pytorch, Weights & Biases, Scikit-learn, Pandas, NumPy, NetworkX, Git, MongoDB