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

Work Experience

▷ RPI, Research Assistant   Spring 2022 - Current
▷ Samsung Research America, Research Engineer Intern   2025 Fall (Upcoming)
▷ IBM, Research Extern   2024 Summer, 2025 Summer (Upcoming)

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 2025, KDD 2025

Skills

▷ Progamming Languages: Python, LaTeX C/C++, MATLAB, Java, JavaScript, and Markdown

▷ Libraries: Pytorch, Weights & Biases, Scikit-learn, Pandas, NumPy, NetworkX, Git, MongoDB