

# Yanna Ding

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PORTFOLIO	<a href="https://dingyanna.github.io">https://dingyanna.github.io</a>
AFFILIATION	Department of Computer Science Rensselaer Polytechnic Institute 110 8th St, Troy, NY 12180
EDUCATION	<b>Rensselaer Polytechnic Institute</b> , Troy, New York, United States <ul style="list-style-type: none"><li>◇ Ph.D. program in Computer Science Advisor: Prof. Jianxi Gao GPA: 4.0/4.0      Spring 2022 - Current</li></ul> <b>University of Toronto</b> , Toronto, Ontario, Canada <ul style="list-style-type: none"><li>◇ Honours Bachelor of Science in Computer Science and Mathematics GPA: 3.92/4.0      2017 - 2021</li></ul>
PUBLICATION	<ul style="list-style-type: none"><li>◇ <b>Architecture-Aware Learning Curve Extrapolation via Graph Ordinary Differential Equation</b> <u>Yanna Ding, Zijie Huang, Xiao Shou, Yihang Guo, Yizhou Sun, Jianxi Gao</u> AAAI, 2025</li><li>◇ <b>Inferring from Logits: Exploring Best Practices for Decoding-Free Generative Candidate Selection</b> <u>Mingyu Derek Ma*, Yanna Ding*</u>, Zijie Huang, Jianxi Gao, Yizhou Sun, Wei Wang (* Equal contribution) NeurIPS ENLSP, 2024</li><li>◇ <b>Efficient Parameter Inference in Networked Dynamical Systems via Steady States: A Surrogate Objective Function Approach Integrating Mean-field and Nonlinear Least Squares</b> Yanna Ding, Jianxi Gao, Malik Magdon-Ismael Physics Review E, 2024, <a href="https://doi.org/10.1103/PhysRevE.109.034301">https://doi.org/10.1103/PhysRevE.109.034301</a></li><li>◇ <b>Learning Network Dynamics via Noisy Steady States</b> <u>Yanna Ding, Jianxi Gao, Malik Magdon-Ismael</u> ASONAM, 2023, <a href="https://doi.org/10.1145/3625007.3631184">https://doi.org/10.1145/3625007.3631184</a></li></ul>
RESEARCH EXPERIENCE	IBM RESEARCH (SUMMER 2024) <ul style="list-style-type: none"><li>◇ <b>In-context Learning</b> IBM Mentors: Dr. Yingdong Lu, Dr. Tomasz Nowicki, Dr. Songtao Lu<ul style="list-style-type: none"><li>• Advanced theoretical understanding of transformers' capacity for in-context learning of dynamic processes.</li></ul></li><li>◇ <b>Multi-level Optimization</b> IBM Mentor: Dr. Songtao Lu<ul style="list-style-type: none"><li>• Designed optimization algorithms and conducted experiments enabling Language Models to in-context learn stepwise functions through chain-of-thought, achieving</li></ul></li></ul>

reduced stepwise error relative to previous methods.

UNIVERSITY OF CALIFORNIA, LOS ANGELES (SPRING 2024)

◇ **Training Dynamics of Neural Networks**

- Applied advanced techniques to develop a machine learning model that leveraged the network architecture and an initial observed time window to capture and predict the dynamics of training trajectories.

RENSSELAER POLYTECHNIC INSTITUTE (SPRING 2022 - PRESENT)

◇ **Reverse Engineering Networked Dynamical Systems**

- Developed and published an efficient algorithm to infer the dynamical parameters via observed system equilibrium and applied the algorithm in a diverse range of fields, including ecology, biology, epidemiology, and neural network training
- Exploring data-driven approaches to infer the governing dynamics of complex systems from time-series data

◇ **Dimension Reduction for Dynamical Complex Systems**

- Developing effective low-dimensional representation of high-dimensional dynamical complex systems
- Applying dimension reduction approaches to study the conditions for the tipping point leading to network collapses

◇ **Network Inference**

- Developed an approach to infer network structure from system equilibrium

UNIVERSITY OF TORONTO

◇ **Social Network Analysis on Stigmatizing Tweets Related to COVID-19 (with Prof. Syed Ishtiaque Ahmed, University of Toronto)** 2020.05 - present

Collected and maintained a dataset of 650+ million tweets. Accomplished statistical analysis on stigmatizing tweets, including calculating correlation between proportion of stigmatizing tweets and political status of states in North America. Constructed a network of hashtags and a retweet network of Twitter users, using Python and Gephi, to find influential hashtags and Twitter users in the networks, respectively. Contributed to a submission to the CPHA's COVID-19 & Public Health Forum in April 2021.

◇ **Inter-rater Reliability App Implementation (with Prof. Priyank Chandra, University of Toronto)** 2020.05 - 2020.09

Worked on the algorithms that calculate the degree of agreement among different raters. Implemented a standalone app that computes various inter-coder reliability statistics (e.g., Fleiss' Kappa) using ElectronJS and React.

HONOURS AND AWARDS ◇ Selected as a graduation spotlight student at the University of Toronto:  
<https://web.cs.toronto.edu/news-events/news/graduation-spotlight-yanna-ding>  
Spring 2021

◇ **Mitacs Research Training Award** Fall 2020

- ◇ **Department of Computer Science, Undergraduate Research Award**  
University of Toronto Summer 2020
- ◇ **Admission Scholarships**, University of Toronto Fall 2017
- ◇ **Dean's List Scholar**, Faculty of Arts and Science, University of Toronto 2018 - 2021
- ◇ **The Chancellor's Scholarship** for high academic achievement  
St. Hilda's Fund 2019, 2020

#### SKILLS

- ◇ Programming in python, L<sup>A</sup>T<sub>E</sub>X, C, C++, MATLAB, Java and JavaScript.
- ◇ Pytorch
- ◇ Relevant courses: Machine Learning and Optimization, Machine Learning from Data, Frontiers in Network Science