

KERUI WU

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Education

University of Massachusetts Amherst (UMass) <i>Ph.D in Computer Science</i>	Sept. 2025 – Present <i>Massachusetts, USA</i>
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Rensselaer Polytechnic Institute (RPI) <i>Bachelor of Science in Computer Science; GPA: 3.76/4.0</i>	Sept. 2021 – May 2025 <i>New York, USA</i>
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<ul style="list-style-type: none">Advised by Professor Mingda QiaoResearch Focus: Learning Theory, Trustworthy ML
Rensselaer Polytechnic Institute (RPI) <i>Bachelor of Science in Computer Science; GPA: 3.76/4.0</i> <ul style="list-style-type: none">Undergraduate Honors: Magna Cum ClaudeDean's Honor List 2021 - 2025Membership in IT & Web Science Honor SocietyResearch Focus: Trustworthy ML, AI for Science, Dynamic Network

Publication

On the Adversarial Robustness of Graph Neural Networks with Graph Reduction

Kerui Wu, Ka-Ho Chow, Wengi Wei, Lei Yu

- Accepted by **ESORICS 2025** (acceptance rate: 16%) — **Oral**

Large EEG-U-Transformer for Time-Step-level Detection without Pre-Training

Kerui Wu, Ziyue Zhao, Bülent Yener

- Under review in **ICLR 2026**

On the Robustness of Graph Reduction Against GNN Backdoor

Yuxuan Zhu, Michael Mandulak, Kerui Wu, George Slota, Yuseok Jeon, Ka-Ho Chow, Lei Yu

- Accepted by **AISec'24 CCS 2024** (acceptance rate: 25%)

Computing equilibria in complex systems with billions of interactions

Yanna Ding, Kerui Wu, Yadi Cao, Malik Magdon-Ismail, Jianxi Gao

- Under review in **Physics Review E**

Research Experience

Representation Learning on Electroencephalography(EEG) Data <i>Advisor: Bulent Yener (Professor)</i>	May 2024 - May 2025 <i>Project Leader</i>
<ul style="list-style-type: none">Propose a representation learning strategy at the time-step level, which eliminates redundant overlapping inference, achieving a 10-fold runtime improvement in event-centric tasks like Seizure detection.Propose a novel neural network architecture for such a time-step level representation learning, which consistently outperformed the most recent baselines, including large foundation models, in various tasks by solely using the downstream datasets.won the 1st place in the <i>2025 Seizure Detection Challenge</i> organized in the International Conference on Artificial Intelligence in Epilepsy and Other Neurological Disorders.	

Robustness of Graph Reduction Against GNN Poisoning <i>Advisors: Lei Yu (Assistant Professor)</i>	Jan. 2024 - May 2025 <i>Project Leader</i>
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- Empirically studied the impact of graph reduction algorithms like coarsening and sparsification on the robustness of GNN against state-of-the-art poisoning, evasion, and backdoor attacks.
- Implemented six coarsening and six sparsification methods across three widely used GNN architectures and two certified robust GNN models to assess their influence in various poisoning and backdoor attacks.
- Visualized clean accuracy and attack success rates under varying hyperparameters and comprehensively analyzed experimental results to interpret the interplay between graph reduction techniques and GNN security.

Efficient Steady-State Solver for Dynamical Complex Networks <i>Advisor: Jianxi Gao (Associate Professor), Yanna Ding (PhD candidate)</i>	Jan. 2024 - May 2025 <i>Collaborator</i>
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- Combined Mean-Filed Approach with a perturbation-based method to efficiently compute steady states in large-scale dynamical systems with precision guaranteed.
- Implemented experiment in large dynamic networks with billions of nodes with four dynamic ODEs.
- Systematically evaluated solver's performance on different typologies like Erdős–Rényi and Scale-Free networks with different degree density and heterogeneity settings.

Work Experience

Full-Stack Developer, Submitty Open Source

Jan. 2023 – May 2023

Advisors: Barb Cutler (Associate Professor)

New York, USA

- Submitty is an open-source course management, assignment submission, exam, and grading system, which is widely used by multiple colleges like RPI.
- Led the design and development of comprehensive full-stack features, including integrating customizable pronoun settings. This involved front-end development using HTML and JavaScript, backend API creation with PHP, and database schema design using SQL.
- Engineered and executed unit tests to ensure feature reliability, leveraging Cypress for testing automation and implementing continuous integration via GitHub workflows.
- Proactively identified, documented, and resolved software bugs, significantly improving system stability and user experience.

Computer Science Mentor, Rensselaer Polytechnic Institute

Sept. 2022 – May 2025

Advisors: Shianne Hulbert (Instructional Support Coordinator)

New York, USA

- Conducted regular office hours, providing one-on-one and group mentoring to assist students in overcoming challenges in their assignments and lab work.
- Facilitated lab sessions, guiding students through problem-solving processes, verifying solutions, and ensuring they grasped key concepts necessary for academic success.

Technical Contribution

China Construction Bank Achievement System | React.JS, Go, MySQL, Azure

Jan. 2024

- Developed a web application for China Construction Bank (CCB) employees to submit their daily achievements, utilizing UI frameworks like MUI. The app is currently in use across 11 bank branches.
- Created a combined web app for administrators to check each employee's daily score, where a table with comprehensive query functional backend APIs, like filter and sort by job positions and bank locations, was provided.
- Create secure signup and login Restful API functions with the use of SHA256 encryption and JWT.
- Deploy the website, including the backend framework and database management system to Microsoft Azure and use workflow scripts in Github to automate such process.

NASA Data Visualization | React.JS, Express.JS, MongoDB

May 2023

- Developed a visualization app for NASA's research on the impact of wind energy on energy production as part of a Web Science System term project.
- Designed and implemented a user-friendly web application using the React framework, enabling intuitive data visualization for complex datasets related to wind energy.
- Engineered and deployed RESTful APIs using Express.js, allowing third-party developers to seamlessly integrate with the system and access the visualization data.

Award & Certificate

CICS Donor-Funded Scholarships

Sept. 2025

Manning College of Information & Computer Sciences at UMass Amherst

1st Place in Seizure Detection Challenge

Mar. 2025

2025 International Conference on AI in Epilepsy and Other Neurological Disorders

Neural Network and Deep Learning

Mar. 2024

DeepLearning.AI

Certified in CyberSecurity (CC)

May 2023

ISC² (International Information System Security Certification Consortium)

Professional Skills

- **Machine Learning & Numerical Computing:** Pytorch, Torch-Geometric, Numpy, Scipy, SKLearn
- **Programming:** Python, C/C++, Javascript, PHP, Go, React.JS, Express.JS, jQuery, R
- **Database:** MySQL, PostgreSQL, MicrosoftSQL, MongoDB
- **Tool:** Ubuntu, KaliLinux, Azure, Git(Hub), NeoVIM
- **Personal Interest:** Fishing, Running, Badminton, Music Production, Go(chess game)