JUNQI LU

GitHub — Google Scholar — Personal Blog
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Beijing, China

EDUCATION

Beijing Institute of Technology, Beijing, China 2024.9 - 2026.6 (expected)
Second Bachelor's Degree in Computer Science | GPA: 3.2/4.0 (**Rank 1/27**)

- Achieved the top rank in a highly condensed two-year curriculum focused on fundamental computer hardware and software courses (e.g., Data Structures, Operating Systems, Computer Architecture).

Beijing Institute of Technology, Beijing, China 2020.10 - 2024.6
Bachelor of Mathematics and Applied Mathematics | GPA: 2.8/4.0

- Gained a solid theoretical background in mathematics, which underpins my quantitative and analytical skills.
- Demonstrated problem-solving abilities through participation in the Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling (MCM/ICM), earning **Meritorious Winner** and **Finalist awards**.

PUBLICATIONS

[1] **Junqi Lu**, Bosen Liu, Cuicui Pei, Qingan Qiu*, and Li Yang*. Learning to optimize termination decisions under hybrid uncertainty of system lifetime and task duration. *Computers & Industrial Engineering*, 2025. DOI: 10.1016/j.cie.2025.111208 (**Published, IF=6.5, JCR Q1**)

[2] **Junqi Lu**, Qingan Qiu*. Learning-driven Condition-based Termination Decisions with Degradation Modeling. (**Manuscript in preparation**).

RESEARCH EXPERIENCE

Reinforcement Learning & State Representation 2025.7 - Present
Research Assistant | Advisor: Prof. Xin Li, Deep Reinforcement Learning Lab, Beijing Institute of Technology

- Investigating **Bisimulation metrics** for state representation learning, focusing on improving the efficiency of credit assignment.
- Developing a novel multi-step bisimulation distance by integrating the principles of λ**-returns** with the **SimSR** framework.
- The proposed metric aims to enhance policy learning by capturing long-term behavioral similarity more effectively than traditional one-step approaches.
- This research is expected to form the basis of my undergraduate thesis and contribute to a potential conference publication.

Reliability Engineering Analysis 2023.6 - 2025.6
Research Assistant | Advisor: Prof. Qingan Qiu, Beijing Institute of Technology

- Developed a **Markov Decision Process (MDP)** framework to model and solve task termination problems for safety-critical systems under hybrid uncertainty.
- Conducted extensive numerical simulations and analyses, leading to a published JCR Q1 paper. The research further served as my undergraduate thesis, which was awarded the **"Excellent Thesis" prize**.
- Currently authoring a second manuscript on Learning-driven Condition-based Termination Decisions with Degradation Modeling, with an expected submission date in late 2025.

SELECTED COMPETITIONS

Interdisciplinary Contest in Modeling (ICM) February 2025
Finalist | **Top 1.96% of 27,456 teams worldwide**

- Modeled the ecological impact of converting forests to farmland by developing dynamic Lotka-Volterra models for nitrogen cycling.
- Innovatively constructed a differential equation model of the nitrogen cycle in the ecosystem, integrating both biological and inorganic components into a single model.
- Provided a comparative analysis of agricultural yield, biodiversity, and sustainability, offering practical recommendations for conservation and land use.
- All source code and paper drafts are publicly available on GitHub: MCM-ICM-2025-E-Nitrogen-Cycling-Model.

Mathematical Contest in Modeling (MCM) February 2023
Meritorious Winner | **Top 9% of 20,858 teams worldwide**

- Developed mathematical models to predict plant community viability under drought conditions, including a *Soil-Water Model* and an *Improved Population Lotka-Volterra Model*.

RELEVANT COURSEWORK

- **Computer Science**: Data Structures and Algorithms, Operating System, Object-Oriented Programming, Machine Learning Fundamentals, Computer Networks.
- **Mathematics**: Real Analysis, Abstract Algebra, Probability Theory and Mathematical Statistics, Partial Differential Equation, General Topology.
- **Advanced Topics**: Reinforcement Learning (Graduate-Level).

SKILLS

Technical Skills

- **Programming**: Extensive experience in **C++**, including Object-Oriented Programming (OOP) and system development on Linux (e.g., a real-time multiplayer chatroom). Skilled in **Python** with expertise in scientific computing (*NumPy, Matplotlib*) and machine learning (*PyTorch*).
- **Tools & Software**: Proficient with **Git** for version control, managing a research portfolio and two personal blogs: an English blog for documenting recent academic work, and a Chinese blog with **over 20 articles** on Data Structures and Algorithms, accumulating **20K+ views**.
- **Academic**: Highly experienced with **LaTeX** for all academic writing. Familiar with **Manim** for visualizations and **Lean 4** for formal proof verification.

INTERESTS

- **Running**: Dedicated long-distance runner with an annual mileage consistently exceeding 1,000 km for three years. My Personal Best(PB) for half-marathon is 1:41:34, demonstrating discipline and perseverance.
- **Music**: Lead guitarist and bassist in two university rock bands. A dedicated rock music enthusiast with a passion for classic rock bands like The Beatles and KISS, showcasing creativity and teamwork.

SUMMARY

- An interdisciplinary researcher with a strong dual-degree background in Mathematics and Computer Science, graduating at the top of a highly condensed CS program (**Rank 1/27**).
- Possesses a proven research record with a published **JCR Q1** paper and a second manuscript in preparation.
- Gained hands-on research experience in two distinct areas: reliability engineering analysis and the application of reinforcement learning and diffusion policies to embodied intelligence.
- Demonstrated exceptional problem-solving and analytical skills through high-level competitions, earning **MCM Finalist** (Top 1.96%) and **Meritorious Winner** awards.