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 | Rank 1/10

- **GPA: 3.2/4.0**. Completed **44.5 credits** of core CS coursework in the first year alone (2024-2025), demonstrating exceptional capability in handling high-intensity academic loads.
- **Selected High Scores:** Linux System Programming (**94**), Machine Learning Fundamentals (**93**), Computer Architecture (**89**), Object-Oriented Programming (**89**), Computer Networks (**86**).
- Ranked **1st** in the final cohort (initial cohort of 27 screened down to 10 with a **63% attrition rate**).

Beijing Institute of Technology, Beijing, China 2020.10 - 2024.6
Bachelor of Mathematics and Applied Mathematics

- Gained a solid theoretical background in mathematics, which underpins my quantitative and analytical skills.

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*. Deep Reinforcement Learning for Condition-based Termination Decisions with Degradation Modeling (**Manuscript in preparation**, expected submission late 2025).

[3] **Junqi Lu**, Xin Li*. A Multi-step Bisimulation Metric Integrating λ-returns and SimSR. (**Working Paper**).

RESEARCH EXPERIENCE

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

- Proposed a **Markov Decision Process (MDP)** framework to solve Mission Abort problems for safety-critical systems, balancing task success probability and system safety under hybrid uncertainty.
- **Published a first-author paper in C&IE (JCR Q1)** detailing the discrete optimization method.
- **Ongoing Extension:** Addressing the **curse of dimensionality** inherent in discrete state spaces by incorporating **Deep Reinforcement Learning (Deep RL)**. Currently developing a continuous control framework to optimize maintenance strategies in high-dimensional complex systems.

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

- Investigating **Bisimulation Metrics** for state representation learning to address credit assignment and double sampling issues in Bellman-based algorithms.
- Completed theoretical derivations for a multi-step bisimulation distance integrating **λ-returns** and SimSR.
- Conducting **pixel-based experiments** on the **DeepMind Control Suite** (e.g., *Cheetah, Walker*). Preliminary results show significant performance gains over baselines in capturing long-term behavioral similarity.
- Targeting submission to **ICML 2026** (International Conference on Machine Learning).

HONORS & AWARDS

Finalist (Top 2%), Interdisciplinary Contest in Modeling (ICM) Feb 2025
Project: Modeling nitrogen cycling in forest-to-farmland conversion (2025 MCM/ICM Problem E)

- Ranked in the **Top 2%** (Finalist) out of 27,456 teams globally.
- **Open Source & Educational Impact:** Developed a comprehensive repository featuring a step-by-step tutorial on differential equation modeling (Euler method vs. ODE solvers).
- The full solution repository, including fully reproducible code (Jupyter Notebooks) and LaTeX source files, has garnered **40+ stars** on GitHub and serves as a learning resource for modeling beginners.

Academic Excellence Scholarship, Beijing Institute of Technology Oct 2025

- Awarded to the **top-ranking student (Rank 1/10)** in the Computer Science Dual Degree program for exceptional academic performance.

University "Excellent Thesis" Prize, Beijing Institute of Technology Jun 2024

- Awarded for the undergraduate thesis on safety-critical system termination.
- **Research Translation:** The thesis was further developed and successfully published as a **JCR Q1 journal paper** in *Computers & Industrial Engineering*.

Meritorious Winner (Top 9%), Mathematical Contest in Modeling (MCM) Feb 2023
Project: Plant community viability prediction under drought conditions (2023 MCM/ICM Problem A)

- Constructed a *Soil-Water Model* and an *Improved Lotka-Volterra Model* to simulate ecosystem dynamics.
- **Huixian Special Scholarship:** Awarded a special institutional grant (Huixian Talent Fund) in recognition of the team's outstanding contribution to the university's competition achievements.

RELEVANT COURSEWORK

- **Computer Science:** Data Structures and Algorithms, Operating Systems, Computer Architecture, Computer Networks, Object-Oriented Programming, Database Principles.
- **Mathematics:** Real Analysis, Functional Analysis, Abstract Algebra, Probability Theory, Mathematical Statistics, Partial Differential Equations (PDE), General Topology, Numerical Analysis.
- **Specialized Topics:** Reinforcement Learning (Graduate-Level), Machine Learning Fundamentals.

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

- **Marathon Running:** Committed long-distance runner with an annual mileage exceeding **1,000 km** for three consecutive years. Half-Marathon Personal Best: **1:41:34**.
- **Music:** Lead guitarist and bassist for university rock bands. Passionate about classic rock arrangement and performance; active participant in campus music festivals.