Changkun Guan

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EDUCATION

Ph.D. in Operations Research 2024 – Present

Georgia Institute of Technology — H. Milton Stewart School of Industrial and Systems Engineering (ISyE), Atlanta, GA

B.S. in Applied Mathematics (Honors, Concentration in Statistics) & B.A. in Computer Science 2020 – 2024

Bucknell University, Lewisburg, PA — Summa Cum Laude

RESEARCH EXPERIENCE

Graduate Researcher, Georgia Tech ISyE 2024 – Present

- OPTAgent: LLM-driven synthesis of solver-selection and configuration policies under shared compute budgets (co-first author, NeurIPS 2026 ML×OR Workshop).
- End-to-end supply chain planning in the paper industry via column generation and Benders decomposition (arXiv:2607.16618).
- Proxy Benders Decomposition: replacing Benders subproblem optimization with certified optimization proxies that generate provably valid cuts (arXiv:2606.07403).
- Learning optimization proxies for sequential contextual stochastic programs, extending our NeurIPS 2025 ML×OR Workshop paper on real-time order fulfillment (arXiv:2606.25362).
- Pareto-regret bounds for stochastic (arXiv:2604.07096) and adversarial (arXiv:2609.23092) multi-objective multi-armed bandits.

Honors Thesis — The Precedence-Constrained Quadratic Knapsack Problem 2024

Bucknell University · Advisor: Dr. Lucas Waddell

- Developed exact and approximate solution methods for this previously unstudied NP-hard nonlinear combinatorial optimization problem; designed heuristics and metaheuristics and generated difficult benchmark instances.

Undergraduate Researcher — Structure of Optimal Covering Arrays 2022 – 2024

Bucknell University · PI: Dr. Thiago Serra

- Studied optimization of combinatorial interaction testing with binary parameters and constraints; worked on proofs about the structure of optimal solutions; implemented models in Gurobi and algorithms in Python.
- Proposed and received funding from Bucknell's Program for Undergraduate Research.
- Culminated in “Optimal Combinatorial Testing with Constraints: The Balancing Act” (arXiv:2607.17083, 2026).

Undergraduate Researcher — Crouzeix's Conjecture 2022

Bucknell University · PI: Dr. Kelly Bickel

- Co-authored a geometric analysis establishing the level set Crouzeix conjecture for classes of nilpotent matrices; developed a Mathematica tool for fast visualization of numerical ranges.

PUBLICATIONS

Hanyang Jiang*, **Changkun Guan***, Miao Li*, Danlin Li, Sikai Cheng, Pascal Van Hentenryck, Russell Bent. "OPTAgent: From Standalone Solvers to Deployment-Aware Solver Ecosystems." *NeurIPS 2026 Workshop on ML×OR*, 2026. (*Equal contribution)

Miao Li, Hanyang Jiang, Hengyu Fu, Baihe Huang, Yating Liu, Yuhang Cai, **Changkun Guan**, Zhongzhu Chen, Jiecheng Lu, Michael A. Boateng, Pascal Van Hentenryck. "Match the Canvas, Not Just the Answer: Predictability-Aware SFT for Diffusion Language Models." *arXiv preprint arXiv:2610.18001*, 2026.

Changkun Guan, Mengfan Xu. "The Role of Coordinates in Pareto Regret for Adversarial Multi-Objective Bandits." *arXiv preprint arXiv:2609.23092*, 2026.

Thiago Serra, **Changkun Guan**, Hunter Gehman, Sumit Dhar, Mikey Ferguson, John Hooker, Marcel Schoppers. "Optimal Combinatorial Testing with Constraints: The Balancing Act." *arXiv preprint arXiv:2607.17083*, 2026.

Changkun Guan, Amira Hijazi, Pascal Van Hentenryck. "End-to-End Supply Chain Planning in the Paper Industry Via Column Generation and Benders Decomposition." *arXiv preprint arXiv:2607.16618*, 2026.

Tinghan Ye, Shuaicheng Tong, **Changkun Guan**, Beste Basciftci, Pascal Van Hentenryck. "Learning Optimization Proxies for Sequential Contextual Stochastic Programs: An Order Fulfillment Application." *arXiv preprint arXiv:2606.25362*, 2026.

Changkun Guan, El Mehdi Er Raqabi, Mathieu Tanneau, Pascal Van Hentenryck. "The Proxy Benders Decomposition." *arXiv preprint arXiv:2606.07403*, 2026.

Changkun Guan, Mengfan Xu. "Are Stochastic Multi-objective Bandits Harder than Single-objective Bandits?" *arXiv preprint arXiv:2604.07096*, 2026.

Xiangyi Li, Yimin Liu, Wenbo Chen, et al. (incl. **Changkun Guan**). "SkillsBench: Benchmarking How Well Agent Skills Work Across Diverse Tasks." *arXiv preprint arXiv:2602.12670*, 2026.

Tinghan Ye, Shuaicheng Tong, **Changkun Guan**, Beste Basciftci, Pascal Van Hentenryck. "Deep Learning-Driven Contextual Stochastic Optimization for Real-Time Order Fulfillment." *NeurIPS 2025 Workshop on ML×OR*, 2025.

Kelly Bickel, Georgia Corbett, Annie Glenning, **Changkun Guan**, Martin Vollmayr-Lee. "Crouzeix's conjecture, compressions of shifts, and classes of nilpotent matrices." *Concrete Operators*, 2024. doi:10.1515/conop-2024-0004.

Changkun Guan. "The Precedence-Constrained Quadratic Knapsack Problem." *Honors Thesis, Bucknell University*, 2024.

TALKS

Crouzeix's Conjecture for Nilpotent Matrices Jan 2023

Joint Mathematics Meetings (JMM) 2023, Boston, MA

TEACHING

Calculus Help Session Leader & Study Group Leader 2022 – 2024

Teaching & Learning Center, Bucknell University — led calculus help sessions and a study group for Multivariable Calculus

Grader 2022 – 2024

Department of Mathematics & Statistics, Bucknell University — Multivariable Calculus, Linear Algebra, Statistical Inference Theory

AWARDS & HONORS

- **The Pi Mu Epsilon Society Prize**, Bucknell University, 2024 — for the most outstanding work in mathematics in the graduating class
- **INFORMS Undergraduate Scholarship**, INFORMS, 2023
- **Mathematics Scholarship**, Bucknell University, 2020 – 2024
- **The Professor George Morris Philips Prize**, Bucknell University, 2020
- **Dean's List**, Bucknell University — all semesters
- Honor societies: **Pi Mu Epsilon** (mathematics, 2023), **Omega Rho** (operations research, 2023), **Tri-Alpha** (first-generation students, 2023)

SKILLS

Optimization	Integer programming, combinatorial optimization, stochastic optimization, Gurobi
Programming	Python, R, Java, Mathematica
Machine learning	Deep learning for decision making, learning-to-optimize
Languages	English, Mandarin Chinese