Jing Guo

Résumé

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Education

Winter 2022 – Summer 2025 **M.Sc. Mathematics**, *Universität Regensburg*, Bavaria, Germany.
Thesis: *A Tale of Two Arcs: The Circle Method and Waring's Problem*
Supervisor: Prof. Dr. Guido Kings
Thesis Grade: 1.7 / 5.0 (gut/good)

Fall 2016 – Spring 2020 **B.S. Mathematics**, *University of Utah*, Salt Lake City, UT, USA.
Minor in Computer Science

Professional Experience

Oct. 2023 – May 2024 **Student Research Assistant (Studentische Hilfskraft)**, *Fakultät für Informatik und Data Science*, Universität Regensburg.
Description: Implemented and optimized fixed-parameter tractable (FPT) algorithms for counting graph homomorphisms in SageMath.

June 2023 – Sep. 2023 **Research Programmer**, *SageMath*, Google Summer of Code.
Supervisor: Dr. Benjamin Hutz
Description: Generalized height algorithms in number fields and other improvements.

June 2022 – Sep. 2022 **Research Programmer**, *SageMath*, Google Summer of Code.
Supervisor: Dr. Benjamin Hutz and Alexander Galarraga
Description: Fixed bugs, improved implementations of height functions, and implemented the Arakelov–Zhang pairing of rational maps in algebraic geometry.

Nov. 2021 – Feb. 2022 **Common Lisp Software Intern**, *Atlas Engineer*, USA and Germany.
Document-structure navigation features, optimizing components for performance and maintainability, improving documentation, addressing user issues, and expanding tests.

Summer 2021 **Research Assistant**, *Budapest Semesters in Mathematics (Online)*, Budapest, Hungary.
Supervisor: Dr. András Gyárfás
Description: Studied the linear Turán number of the Crown C_{13} in linear 3-graphs.

Sep. 2020 – Oct. 2020 **Research Programmer (Contract)**, *University of Bergen*, Bergen, Norway.
Supervisor: Dr. Mateus de Oliveira Oliveira
Description: Implemented functionality related to treewidth and tree decomposition.

Sep. 2019 – Sep. 2020 **Undergraduate Researcher**, *School of Computing*, University of Utah.
Supervisor: Dr. Blair D. Sullivan
Description: Improved heuristics and approximation algorithms for Vertex Cover and Odd-Cycle Transversal with fixed-parameter tractable algorithms.

Publications and Preprints

[1] "QEDBench: Quantifying the Alignment Gap in Automated Evaluation of University-Level Mathematical Proofs". In: *ICML 2026*. Also presented at the 3rd AI for Math Workshop at ICML 2026. 2026.

[2] Alvaro Carbonero, Willem Fletcher, Jing Guo, András Gyárfás, Rona Wang, and Shiyu Yan. "Crowns in Linear 3-Graphs of Minimum Degree 4". In: *The Electronic Journal of Combinatorics* 29.4 (2022), P4.17.

Open Source Contributions

June 2023 – May 2024 **SageMath**, *Free open-source mathematical software system.* June 2022 – Oct. 2022
`https://www.sagemath.org/`

Nov. 2021 – Feb. 2022 **Nyxt Browser**, *Keyboard-driven web browser written in Common Lisp.*
`https://nyxt.atlas.engineer/`

Software

May 2024 **count-graph-homs**, *SageMath library for graph homomorphism counting.*
`https://github.com/guojing0/count-graph-homs`

February 2020 **turbo-oct**, *Turbo-charging Odd-Cycle Transversal with fixed-parameter tractable (FPT) subroutines.*
`https://github.com/guojing0/turbo-oct`

Personal Projects

February 2026 **IMO Math Agent**, *An AI agent pipeline system for solving IMO problems, inspired by the IMO25 project.*
Code: `https://github.com/guojing0/imo-math-agent`
Post: `https://guoj.org/imo-math-agent.html`

August 2025 **Smol MoE Language Model**, *Implemented a small MoE language model (Switch Transformer), upcycled a dense LLM into a MoE model (sparse upcycling), and continued pretraining this MoE model.*
Code: `https://github.com/guojing0/cohere-scholar-take-home-2026`

Professional Service

Reviewer **Third AI for Math Workshop**, *ICML 2026.*

Other Information

Programming: Python, Common Lisp, Racket/Scheme, Lean, Ruby, Java, C/C++, and LaTeX

Technical skills: Codex / Claude Code, PyTorch, Django, Flask, and Linux

Languages: Chinese, English, German (Basic), and Russian (Basic)