

Yunus Tuncbilek

(604) 364-9153 | yunust418@gmail.com | Vancouver, BC · Permanent Resident (no sponsorship required)

[LinkedIn](#) | [Personal Website](#)

SUMMARY

Backend and optimization engineer with 2+ years of full-time SDE experience; Yale CS & Math. Recast a long-standing problem in US Census employment data as a linear program and built a Gurobi-based solver that replaced the field's approximate method with exact solutions and cut per-year runtime from over two days to twenty minutes (~150x speedup). The resulting dataset is now in use across spatial economics. Also shipped an open-source C++/ROS computer vision wrapper on pre-release social robotics hardware, and taught competition-level algorithms for two years. Targeting SDE roles in backend systems and large-scale optimization.

SKILLS

- **Programming Languages:** Python, Java, C++, C, JavaScript, SQL, MATLAB
- **Cloud & Infrastructure:** Google Cloud Platform (GCP), Google Cloud App Engine
- **Frameworks & Databases:** Node.js, Robot Operating System (ROS), OpenCV, Gurobi Optimization Solver, MySQL
- **Core Software Engineering:** Systems Programming, Data Structures & Algorithms (DSA), Object-Oriented Design (OOD), Code Reviews, Version Control (Git)
- **AI & Optimization:** Retrieval-Augmented Generation (RAG), AI System Architecture, VS Code (Claude ext.)
- **Technical Leadership:** Engineering Mentorship, Team Leadership, Architecture & Design Discussions
- **Advanced Mathematics:** Linear Programming, Optimization, Extremal Graph Theory, Number Theory

HIGHLIGHTED PROJECTS

- [Math-Mate](#) (Solo Project, 2025-2026)
 - An AI tutoring assistant that lets teachers configure the underlying model directly: instructors set custom instructions controlling the AI's tone, pedagogical approach, and how it should guide students toward answers without revealing them outright, giving teachers control over pedagogy that most off-the-shelf AI tutors don't expose. Built with Retrieval-Augmented Generation (RAG) for context-aware, homework-specific guidance.
- [US Census Employment Data Recovery Solver](#) (2019)
 - The first dataset to provide fully imputed employment values for every suppressed cell across all years of the CBP (1975–2016), turning a partially-suppressed federal dataset into a complete, research-ready panel now used across spatial and labor economics (+250 academic researcher users). Built with a Gurobi-based linear programming solver run on Yale's HPC cluster.
- Glasshopper (2016)
 - Built a full-stack solution with Node.js and MySQL, a custom jQuery front-end, and deployed on Google Cloud Platform. Yale's first public extracurricular review platform, pairing structured student feedback with one of the first complete directories of campus organizations so students could evaluate activities before committing.
- For a full list of my projects, visit my [personal website](#).

RELEVANT SOFTWARE ENGINEERING EXPERIENCE

Yale University, New Haven, CT, USA

May 2016 – July 2019

Research Assistant - Software Engineering (Full time)

- Reformulated a long-standing US Census suppression problem (60% of cells withheld, ~200M missing values) as a linear program and built a solver that reconstructs all cells exactly, superseding the approximate methods in prior literature. Reduced per-year runtime from 2 days to 20 minutes on Yale's HPC cluster (~150x speedup). Co-created a public dataset spanning 42 years - now a standard dataset in spatial and labor economics; the accompanying paper has been cited 250+ times.

Yale University, New Haven, CT, USA

May 2016 – August 2016

Research Assistant - Software Engineering (Part time)

- Engineered a high-performance, open-source ROS wrapper in C++ to integrate a legacy computer vision face-tracker into pre-release social robotics hardware (Jibo).
- Optimized multi-modal data pipelines using linear algebra to translate raw spatial coordinates into real-time face orientation and attention metrics, maximizing data throughput and accuracy.
- Architected low-latency software components for interactive games designed to support cognitive development milestones for children with ADHD, culminating in a successful production launch.
- Maintained clean code standards and version control, publishing the core integration framework as an open-source contribution ([GitHub Repository](#)).

OTHER PROGRAMMING EXPERIENCE

Zhuge Academy Education, Vancouver, BC, Canada

September 2024 – June 2026

Competitive Programming Coach (Full time)

- Promoted to Head of Computer Science for driving instructional excellence in CS; established rigorous code review standards and delivered 6 weekly technical knowledge-sharing sessions that measurably raised overall code quality.
- Architected and delivered comprehensive technical modules on Data Structures and Algorithms along with 200+ LeetCode Medium/Hard Problems to students preparing for Canadian Computing Competitions (CCC), driving nearly all students to advance a full competition level in CCC (from Beginner to Junior or Junior to Senior).
- Leveraged data-driven methodologies to teach 10+ concurrent technical courses as sole instructor, achieving a 100% retention rate in Fall 2025 through effective technical communication and project-based milestones.
- [GitHub Repository](#) of my coding exercises for the students.

EDUCATION

University of Wisconsin-Madison, WI, USA

Graduate Studies in Mathematics (PhD Program - Incomplete)

September 2019 – July 2023

GPA: 3.750

- Passed all doctoral qualifying examinations required for PhD Candidacy.
- Completed 64 credits (22 courses) of advanced graduate courses for research in Analytic Number Theory.

Master of Arts in Mathematics

December 2022

GPA: 3.625

Yale University, New Haven, CT, USA

Bachelor of Science in Computer Science and Mathematics

September 2014 – May 2018

GPA: 3.83

- Distinction in the Major (Earned A or A- in three-quarters of the credits in the major subject)
- Earned *cum laude* (Top 30 percent of the graduating class in GPA)

AWARDS

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| • Top 500, Putnam Mathematics Competition, USA | 2017 |
| • Gold Medal, Mediterranean Mathematics Olympiads and Silver Medal, National Olympiads | 2014 |
| • First Place, National Mathematics Research Competition of Turkey | 2013 |

RESEARCH & PUBLICATIONS

Carnegie Mellon University, Pittsburgh, PA, USA

May 2017 – July 2017

Research Assistant | Summer Undergraduate Applied Mathematics Institute

- Selected for an elite summer research institute focused on extremal graph theory and discrete mathematics.
- Co-authored and published peer-reviewed research titled "*Anti-Ramsey Multiplicities*" ([arXiv:1801.00474](#)), solving open problems regarding edge-coloring properties in complete graphs.

UNIVERSITY TEACHING EXPERIENCE

University of Wisconsin-Madison, WI, USA

August 2019 – May 2023

Graduate Teaching Assistant

- Earned the Exceptional Teaching Award after serving as the Sole Instructor for two math courses.
- Facilitated technical discussion sections for CS 435 (Introduction to Modern Cryptography); focused on the transition from theoretical primitives to provably secure architectures.