Robyn Burger

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Education

Cornell University, M.S. Computer Science — Aug '25 – May '27
- Thesis-based program, advised by Paul Golz and Siddhartha Banerjee
- **Research topics:** optimization, applied math, data science, algorithmic game theory

Cornell University, B.A. Mathematics, B.A. Computer Science — Aug '22 – May '25
- GPA: **3.68**/4.0 *(cum laude)*
- **Coursework:** AI, Randomized Algorithms, Object-Oriented Programming, Data Structures
- **Technical Skills:** Python, Java, OCaml, C, Ruby, SQL, Javascript, , Jira, GitHub, Unix, LaTeX, HTML

Experience

Head TA, CS 2800: Discrete Math, Cornell University — Spr '23, '24, '25, Fall '23, '25
- Leads 300-student review lectures, teaches 25-student discussion sections
- Creates rubrics for exams, homework and leads team of 10 TAs through grading.
- Recipient of department-wide TA excellence award.

Algorithms Researcher, Montana State University REU — May - Aug '24
- Created integer linear program to reconstruct phylogenetic trees of tumor samples in Python using Gurobi, NumPy, Pandas.
- Built group-testing suite based on real and simulated data of leukemia patients.
- Co-authored paper: "EssentCell", (presented at RECOMB-CCB '25, published IEEE TCBB '25) [PDF] [Git]

Agile Backend Software Engineer, SC Johnson School of Business IT, Cornell University — May – Aug '23
- Spearheaded modernization of legacy PHP into scalable Ruby on Rails, ensuring security and reliability.
- Collaborated with team in daily stand-up meetings to implement client feedback across multiple Agile programs.

Financial Data Fellow, Imani Oakley for Congress — Aug – Nov '21
- Analyzed campaign finance data (6-figure budget) and donor database to advise on optimization of financial strategies.

Publications and Presentations

EssentCell: Discovering Essential Evolutionary Relations in Noisy SCS Data [PDF] [Git]
- Published IEEE/ACM Transactions on Computational Biology and Bioinformatics '25
- Presented at RECOMB-CCB '25
- **Keywords**: combinatorial optimization, integer linear programming

Approximating the Longest k-Repeated Subsequence (LKRS) [PDF] — Sep '24 - Aug '25
- Created and implemented $\frac{2}{3}$-approximation algorithm using combinatorial properties of LKRS in Python.
- Presented independent research at University of Michigan Theory Seminar (12/24).

Scholarly Work

Allocation of Scientific Credit with Altruistic Players [PDF] — Dec '24
CS 6840 Graduate Algorithmic Game Theory, Professor Eva Tardos
- Incorporated altruism into Kleinberg–Oren credit allocation model, deriving new PoA bounds in special cases.
- Applied multiplicative weights learning algorithm, showing altruism accelerates convergence to near-optimal allocations with 42% welfare improvement in simulations.

Optimizing PrivGraph [PDF] [Git] — Dec '23
CS 6850 Graduate Information Networks, Professor Jon Kleinberg
- Optimized existing differential privacy alg. in Python. Added support for concurrent testing of generated datasets.
- Using multiple linear regression (MLR), found a median of 13% improvement across chosen graph metrics.

OCaml Linear Algebra Library [Git] — Spr '23
- Created library of functions to support matrix/vector operations, and created U/I interface.

Leadership and Service

President, Association of CS Undergraduates Oversaw all functions of 500-member CS club — Fall '23 - Spr '24

President, Triphammer Coop Managed logistics of 20-person, student-governed residence — Fall '24 - Spr '25

Instructor, Cornell Outdoor Ed. Teaches 16-student courses in rock climbing and backpacking — Spr '23 - Fall '25

Awards

Jonathan E. Marx Memorial Senior Prize: Awarded to two graduates for outstanding leadership — May '25

Sphinx Head Honors Society: One of 40 seniors invited to Cornell's oldest senior honors society — Fall '24- Spr '25

Most Impactful Student Award: Given by Cornell CIS DEIB office — Apr '24