Timothy W. Randolph

t.randolph@columbia.edu
+1 (206) 713-9086
twrand.github.io

Columbia University
Department of Computer Science
Mudd Building, Room 522
New York, NY 10027

Education

Columbia University, New York, NY — 2018-Present
Ph.D., Computer Science — Expected 2024
Thesis: "Exact Algorithms for Subset Sum and Subset Balancing Problems"
M.Phil., Computer Science — 2022
M.S., Computer Science — 2019
Advised by Xi Chen *and* Rocco A. Servedio

Williams College, Williamstown, MA — 2014-2018
B.A., Computer Science (Highest Honors), Mathematics (Honors), Philosophy — 2018
Thesis: "(k, p)-Planar Graphs: A Generalized Planar Representation for Cluster Graphs"
Advised by William J. Lenhart

Teaching Experience

Columbia University, New York, NY

Instructor for COMS 3261: Computer Science Theory — Summer 2023
Teaching focus on participatory governance and grading for equity.
Course Mean: 4.87/5; Instructor Mean: 4.93/5

Teaching Development Program (Advanced Track) — 2019-2022
Multiyear evidence-based teaching certification in association with Columbia's Center for Teaching and Learning.

Instructor for COMS 3261: Computer Science Theory — Summer 2022
Teaching focus on accessibility via parallel multimodal teaching strategies.
Course Mean: 4.77/5; Instructor Mean: 4.92/5

Instructor for COMS 3261: Computer Science Theory — Summer 2021
Teaching focus on organization and accountable teaching in the hybrid environment.
Course Mean: 4.48/5; Instructor Mean: 4.7/5

Teaching Observation Fellow — 2019-2020
Yearlong fellowship centered on peer observation and reflective teaching practice.

Peer lectures delivered in COMS 6261: Advanced Cryptography. — 2020

Guest lecture delivered in COMS 4236: Computational Complexity. — 2019

Substitute lectures delivered in COMS 4231: Analysis of Algorithms. — 2019

Innovative Teaching Summer Institute (ITSI) 2019
Summer intensive in association with Columbia's Center for Teaching and Learning.

TA for COMS 3261: Computer Science Theory. 2019

TA for COMS 6998-06: Computation and the Brain. 2018
Introduced anonymous grading to mitigate the effect of implicit bias on student evaluation.

Awards

Michelman Award for Exemplary Service to the CS Department 2022
Awarded to a single student for exceptional service contributions during their PhD studies.

Columbia CS Department Service Award (3x) 2020, 2021, and 2023
Awarded to Ph.D. students in the top 10% of service contributions.

Sam Goldberg Prize 2018
Awarded for the best colloquium in Computer Science at Williams College.

Elected Member, Sigma Xi 2018

Williams Class of 1960s Scholar in Computer Science (2x) 2017 and 2018
Awarded to exceptional students endorsed by the department for academic careers.

Elected Member, Phi Beta Kappa (Junior Year) 2017
Awarded to students in the top 5% of graduating class by GPA.

Williams Class of 1960s Scholar in Cognitive Science 2017
Awarded to exceptional students endorsed by the department for academic careers.

Journal and Conference Publications

Parameterized Algorithms on Integer Sets with Small Doubling: Freiman's Theorem, Subset Sum and k-Sum Preprint, 2023.
Tim Randolph and Karol Węgrzycki

Experience Report: Participatory Governance in the CS Theory Classroom
Tim Randolph SIGCSE 2024.
ACM Technical Symposium on Computer Science Education

Testing Sumsets is Hard Preprint, 2023.
Xi Chen, Shivam Nadimpalli, Tim Randolph, Rocco Servedio, and Or Zamir

Exact Algorithms for Finding Sumsets Preprint, 2023.
Tim Randolph

A Hybrid Algorithm for Subset Sum and Equal Subset Sum Preprint, 2023.
Tim Randolph

Subset Sum in $2^{n/2}/poly(n)$ Time RANDOM 2023
Xi Chen, Yaonan Jin, Tim Randolph, and Rocco Servedio
27th International Conference on Randomization and Computation
View Online

A Note on the Complexity of Private Simultaneous Messages with Many Parties
Marshall Ball and Tim Randolph ITC 2022
3rd Annual Conference on Information-Theoretic Cryptography
View Online

Average-Case Subset Balancing Problems SODA 2022
Xi Chen, Yaonan Jin, Tim Randolph and Rocco Servedio
33rd Annual ACM-SIAM Symposium on Discrete Algorithms
View Online

Parallel Lotteries: Insights from Alaskan Hunting Permit Allocation
Nick Arnosti and Tim Randolph MS 2021; EC 2021
Management Science Vol. 68, No. 7 (Journal version)
22nd ACM Conference on Economics and Computation, as "The Alaskan Hunting License Lottery is Flexible and Approximately Efficient" (Conference abstract)
View Online

A Lower Bound on Cycle Finding in Sparse Digraphs SODA 2020; TALG 2022
Xi Chen, Tim Randolph, Rocco A. Servedio, and Tim Sun
ACM Transactions on Algorithms, Vol. 18, Issue 4 (Journal Special Issue)
31st Annual ACM-SIAM Symposium on Discrete Algorithms (Conference Version)
View Online

(k, p)-Planarity: A Relaxation of Hybrid Planarity WALCOM 2019; TCS 2021
Emilio di Giacomo, William J. Lenhard, Giuseppe Liotta, Timothy W. Randolph, and Alessandra Tappini
Theoretical Computer Science, Vol. 896 (Journal Special Issue)
13th International Conference and Workshops on Algorithms and Computation (Conference)
View Online

Tight Bounds for $(t, 2)$-Broadcast Domination on Finite Grids RHUMJ 2019.
Timothy W. Randolph
Rose-Hulman Undergraduate Mathematics Journal, Vol. 20
View Online

Optimal (t, r)-Broadcasts on the Infinite Grid DAM 2019.
Benjamin F. Drews, Pamela E. Harris, and Timothy W. Randolph
Discrete Applied Mathematics, Vol. 255
View Online

Invited Talks and Posters

Research Presentations

"Exact and Parameterized Algorithms for Subset Sum Problems" (thesis defense)
Columbia University, New York, NY, 4/9/24

"Designing Algorithms for Hard Problems: A Case Study" (talk)
Williams College Computer Science Colloquium Series, Williamstown, MA, 4/5/24

"Experience Report: Participatory Governance in the Computer Science Theory Classroom" (talk), *ACM Technical Symposium on Computer Science Education (SIGCSE)*, Portland, OR, 3/21/24

"Algorithmic Approaches to Subset Sum (And Other Hard Problems)" (talk)
Harvey Mudd College, Pomona College, Amherst College, Bard College, Union College, 10/31/2023-11/25/2023

"Log Shaving for Subset Sum" (talk)
27th International Conference on Randomization and Computation (RANDOM 2023), Atlanta, GA, 9/12/2023

"The Complexity of PSM with Many Parties" (talk)
3rd Conference on Information-Theoretic Cryptography (ITC 2022), Boston, MA, 7/6/2022

"Average-Case Subset Balancing Problems" (talk)
31st Annual Symposium on Discrete Algorithms (SODA 2019), Virtual, 1/9/22

"Parallel Lotteries: Insights from Alaskan Hunting Permit Allocation" (poster)
22nd Conference on Economics and Computation (EC 2021), Virtual, 7/21/21

"Alaskan Hunting License Lotteries are Flexible & Approximately Efficient" (talk, poster)
DSI Financial and Business Analytics Center, New York, NY, 11/12/2019
15th Conference on Web and Internet Economics (WINE 2019), New York, NY, 12/10/2019

"The Case for Wasteful Allocation Mechanisms" (talk, poster)
1st INFORMS Workshop on Market Design, Phoenix, AZ, 6/28/2019
3rd Workshop on Mechanism Design for Social Good (MD4SG 2019), Phoenix, AZ, 6/28/2019

"(k,p)-planar Drawings of Cluster Graphs" (talk)
Williams College Summer Science Expo, Williamstown, MA, 8/11/2017

"Automated Constraint Pattern Extraction" (talk)
Microsoft Bing Intern Summary Presentations, Seattle, WA, 8/17/2016

"Simplifying the Driver Stack for Windows 10 on the Raspberry Pi" (talk)
Microsoft IoT Core Summary Presentations, Seattle, WA, 8/15/2015

Outreach Presentations

"Research and Exploration in (Theoretical) Computer Science" (talk)
Columbia Engineering Summer High School Academic Program (SHAPE), New York, NY, 8/11/2022

"Demystifying the Dissertation: Research in Theoretical Computer Science" (talk)
Columbia University Demystifying the Dissertation Seminar Series, New York, NY, 12/9/2020

"Research in Algorithms and Mechanism Design" (talk)
Columbia Emerging Scholars Program (ESP) Research Symposium, New York, NY, 11/20/2020

"Demystifying the PhD: Applying to PhD Programs" (talk)
Columbia University PhD Project Presentation Series, New York, NY, 11/18/2020

Service

Professional Service

Program Committee / Conference Reviews
ACM Symposium on Theory of Computing (STOC)
ACM-SIAM Symposium on Discrete Algorithms (SODA)
ACM Special Interest Group on Computer Science Education Technical Symposium (SIGCSE)
European Symposium on Algorithms (ESA)
International Colloquium on Automata, Languages, and Programming (ICALP)
Symposium on Simplicity in Algorithms (SOSA)

Session Chair
ACM-SIAM Symposium on Discrete Algorithms (SODA 2022)

Institutional Service

PhD Student Representative, Columbia University 2022-Present
Represented the CS department student body at faculty meetings. Worked to ensure timely compensation of graduate students, international student rights, and facilities maintenance. Streamlined the conference and travel reimbursement process.

PhD Coordinator, Columbia University Emerging Scholars Program 2019-2022.
Organized ESP, a peer-taught, discussion-based seminar focused on group problem-solving and exposing students to the breadth of computer science. Developed new initiatives and curriculum to support and engage underrepresented groups and nontraditional students in computer science at Columbia. Quadrupled program size.

Union Organizer, Student Workers of Columbia (UAW Local 2710) 2021-2022.
Educated, enrolled and advocated for computer science graduate students during contract negotiations and subsequent union recognition.

Founding Organizer, Columbia Pre-Submission Application Review Program 2020-2021.
Helped create, implement and review applications for Columbia's first STEM PhD application feedback program for underrepresented and nontraditional applicants.

Founding Organizer, Columbia Graduate Student Theory Retreat 2019-2021
Created Columbia's first annual theory retreat for graduate students.

Speaker, Columbia "Demystifying the Dissertation" Initiative 2020-2021
Lead undergraduate seminars on applying to and navigating graduate school.

Advising and Mentorship

Mentor, Williams CS Alumni Mentorship Program 2022-Present
Mentored advanced undergraduates on career navigation and the transition to graduate school.

Mentor, Women in Science at Columbia (WISC) 2021-Present
Mentored advanced undergraduates during their application and transition to graduate school.

Mentor, Lumiere Research Scholars Program 2022
Mentored talented high school students pursuing independent research projects in computer science theory and mechanism design.

Mentor, Barnard Better, Enhance, and Advance Research Series (BEARS) 2022
Advised a group of Barnard undergraduates with an early interest in research careers.

Advisor, Columbia Undergraduate Theory Seminar 2022
Consulted with a group of advanced undergraduate students on the development of their presentations for a student-run seminar on computer science and philosophy.