

Yang Tan

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EDUCATION BACKGROUND

Carleton College

Bachelor of Arts; Double Major in Mathematics and Computer Science

Northfield, MN

Expected Graduation: June 2025

- GPA: 3.82/4.0
Selective Math Coursework: Mathematical Structures, Probability, Computational Mathematics, Abstract Algebra, Functions in Complex Variables, Elementary Theory of Numbers, Galois Theory, Ordinary Differential Equations, Senior Seminar (Tournament).
- CS Coursework: Data Structures, Intro to Computer Science, Intro to Computer Systems, Program Language Design & Implement, Software Design, Algorithm, Computer Network

Budapest Semesters in Mathematics (BSM)

Budapest, Hungary

Sept. 2023 - Dec. 2023

- GPA: 4.0/4.0
 - Coursework: Graph Theory, Advanced Combinatorics, Theory of Computing, Introduction to Mathematical Analysis
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RESEARCH EXPERIENCE

Finding Balanced Walls to Cubulate Random Group, Carleton College

Northfield, MN

July. 2023 - Present

Supervisor: Prof. MurphyKate Montee

- Disprove conjecture of Prof. M Montee.
- Developed a potential method to show that Gromov random groups of $d < 1/4$ act on a $CAT(0)$ cube complex.
- Proved several cases for the potential method.

Extremal Problems in Planar Graphs, BSM

Budapest, Hungary

Sept. 2023 - Dec. 2023

Supervisor: Prof. Ervin Gyori,

- Calculated the maximum number of edges in a planar graph while excluding specific subgraphs (Forbidden subgraph problem).
- Discovered extremal constructions on the three five-vertex subgraphs we chose.

Approximating Bitvectors using the Disjunction of Exemplars, Carleton College

Northfield, MN

May. 2023 - Aug. 2023

Supervisor: Prof. Anna Rafferty & Prof. David Liben-Nowell

- Polynomial reduced the problem to the binary version of "Location of Bank Accounts to Optimize Float" and proved it is NP-hard.
- Constructed a tight $\frac{1}{2}$ -approximation algorithm if each exemplar contains exactly two characteristics.
- Simplified (added more constraints to) the problem and obtained a polynomial-time solvable subproblem.

Careers in Software Engineering Extern at Carleton College

Northfield, MN

Dec. 2022

- Built a demo application to automatically book seats for airlines like Southwest to get the best boarding position using Python Flask with teammates.
- Solved several frequent programming challenges with volunteers who have computer science-related careers.

Research on the Artificial Intelligence in Network-security, Chinese Academy of Sciences

Remote

Sept. 2022 - Apr. 2023

Supervisor: Prof. Haiyang Jiang

- Actively participated in a specialized reading group focusing on several papers exploring the plain Bayesian model in Network Security contexts.
 - Collected data from the public rulesets using Snort and discussed the results with the professor.
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PRESENTATIONS

Joint Mathematics Meetings (JMM)

Jan. 2025(Future)

- Spearheaded a group visual-novel game project using Unity, bringing together students from diverse disciplines, including art, literature, music, and computer science.

Northfield Undergraduate Mathematics Symposium(NUMS)

Jan. 2024 - Present

- Engineered a cloud storage optimization system for Carleton, which incorporates data management & visualization
 - Designed a website, including HTML design, frontend design, and backend integration with Google Cloud service
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EXTRACURRICULAR & LEADERSHIP EXPERIENCE

President & Founder, Carleton Game Development Club, Carleton College

Mar. 2024 - Present

- Spearheaded a group visual-novel game project using Unity, bringing together students from diverse disciplines, including art, literature, music, and computer science.

Research Assistant, DataSquad, Carleton College

Jan. 2024 - Present

- Engineered a cloud storage optimization system for Carleton, which incorporates data management & visualization
- Designed a website, including HTML design, frontend design, and backend integration with Google Cloud service

Math Grader

Jan. 2023 - Apr. 2023

- Evaluated and provided detailed feedback on undergraduate mathematics assignments

Math Tutor, Math Skill Center, Carleton College

Sept. 2022 - May. 2023

- Explained mathematical concepts to the students who were having difficulty understanding them

- Assisted students with homework, projects, test preparation, and research they were working on
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SKILLS & LANGUAGES

Programming skills**Languages:** Python (proficient), Java (proficient), C(proficient), C# (basic), Javascript (basic), Unity (basic)
LSpoken languages: Mandarin Chinese (native), English (fluent)