

Szymon Gustav Snoeck

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Education

Columbia University

Bachelor of Science, Applied Mathematics. Minor in Computer Science. GPA: 4.00
Dean's List (2022-2025)

New York, NY

2022 - 2026

BASIS Independent Brooklyn

High School Diploma. GPA: 4.00
Graduated Salutatorian. Honor Roll (2018 - 2022)

New York, NY

2018 - 2022

Research Experience

Research Project with Prof. Nakul Verma

Dimension Reduction Research

Columbia University, New York, NY

February 2023 – Present

- Studied shortcomings of data visualization methods including t-SNE and UMAP from a theory perspective
- Received \$6000 in funding through SUMMER@SEAS for research during summer of 2025
- Co-authored two theory papers currently submitted for review

Research Project with Prof. Alexandr Andoni

Nearest Neighbor Algorithms Research

Columbia University, New York, NY

June 2025 – Present

- Working towards proving data-dependent lower bounds for nearest neighbor search with a focus on the List-Of-Points model

COMS 6998: Theoretical Foundations of Large Language Models with Prof. Daniel Hsu

Columbia University, New York, NY

January 2025 – May 2025

- Surveyed theory literature on NLP, learning theory, transformers, and chain-of-thought
- Completed a final project on the plausibility of stealing model weights via black-box queries which included proving a uniform convergence bound for learning non-i.i.d. data

Research Project with Prof. Yuri Faenza

Online Matching Theory Research

Columbia University, New York, NY

June 2024 – August 2024

- Studied online bipartite matching and welfare functions
- Received \$6000 in funding through SUMMER@SEAS for research during summer of 2024
- Authored an unpublished note proving the impossibility of constant-factor approximation for online bipartite matching with respect to the Nash Social Welfare function

COMS 6998: Unconditional Lower Bounds and Derandomization with Prof. Rocco Servedio

Columbia University, New York, NY

January 2024 – May 2024

- Surveyed lower bounds and pseudorandom generators for several restricted models of computation
- Conducted final project on constructing deterministic approximate counters for \mathbb{F}_2 Polynomials under the polarizing random walks framework via correlation-based Fourier tail bounds

Publications

Szymon Snoeck, Noah Bergam, and Nakul Verma. Compressibility Barriers to Neighborhood-Preserving Data Visualizations. Under Review at International Conference on Algorithmic Learning Theory (ALT). 2025

Noah Bergam, **Szymon Snoeck**, and Nakul Verma. t-SNE Exaggerates Clusters, Provably. Under Review at International Conference on Learning Representations (ICLR). 2025

Manuscripts

Szymon Snoeck. A Uniform Convergence Result for Learning Text Data. 2025

Szymon Snoeck. The Negative Inter-Dependencies of the Multivariate Hypergeometric Distribution. 2025

Szymon Snoeck, Christopher En, Yuri Faenza. The Difficulty of Approximating Nash Social Welfare in Online Matching. 2024

Szymon Snoeck, Sam Wang. Deterministic Approximate Counting F2 Polynomials Via Correlation-based Fourier Bounds. 2024

Teaching Experience

Computer Science Department Unsupervised Learning Teaching Assistant

Columbia University, New York, NY
September 2025 – Present

- Host weekly office hours and tutor students in unsupervised machine learning
 - Coordinate with another TA to develop assignments, write solutions, grade homework, and advise research projects

Computer Science Department
Machine Learning Teaching Assistant

Columbia University, New York, NY
January 2024 – May 2025

- Hosted weekly office hours and tutored students in applied and theoretical machine learning
 - Devised intuitive approaches to complex topics to make them palatable for a range of mathematical backgrounds
 - Coordinated with other TAs to develop assignments, write solutions, and grade homework

Peer Tutoring

Peer Tutor

BASIS Independent Brooklyn, New York, NY

September 2019 – 2022

- Tutor K-12 students struggling in math and science
 - Weekly one-on-one meetings with students to help with homework and studying

Skills

Technical: Proficiency with LATEX, Java, Python, C, HTML, CSS, SKLearn, NumPy, SciPy, TensorFlow, and Pandas
Artistic: Photography, inking, oil painting, Adobe Photoshop, and Adobe Lightroom

Language: Dutch (Fluent), and French (Elementary Proficiency)

Banggaae: Daven (Frauen), und Frechen (Elementary Frechenes)

Awards

CRA Outstanding Undergraduate Researcher Award Nomination | Columbia University Fall 2023
Dean's List | Columbia University Fall 2023 Spring 2025

Dean's List | Columbia University
Salutation | BASIS Independent

Fall 2022 - Spring 2025
Summer 2023

Salutatorian | BASIS Independent Brooklyn
Honor Roll | BASIS Independent Brooklyn

Spring 2022
Sect. 2022

Honor Roll | BASIS Independent Brooklyn

Fall 2018 - Spring 2022
Section 2021

7th Place at State Championship | New York City Urban Debate League

Spring 2021

**2 gold keys, 1 silver key, and an honorable
Exhibited a photograph at The Metropolitan
in its 1860 Catalogue. A. & S. Witting, A. and**

missions to Scholastic Art & Writing Awards
National AP Scholar | College Board Fall 2020