Szymon Gustav Snoeck

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Education

Columbia University — New York, NY
Bachelor of Science, Applied Mathematics. Minor in Computer Science. GPA: 4.00 — 2022 - 2026
Dean's List (2022-2025)

BASIS Independent Brooklyn — New York, NY
High School Diploma. GPA: 4.00 — 2018 - 2022
Graduated Salutatorian. Honor Roll (2018 - 2022)

Research Experience

Research Project with Prof. Nakul Verma — Columbia University, New York, NY
Dimension Reduction Research — 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 — Columbia University, New York, NY
Nearest Neighbor Algorithms Research — 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 — Columbia University, New York, NY
with Prof. Daniel Hsu — 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 — Columbia University, New York, NY
Online Matching Theory Research — 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- Authored an unpublished note proving the impossibility of constant-factor approximation for online bipartite matching with respect to the Nash Social Welfare function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 — Columbia University, New York, NY
with Prof. Rocco Servedio — 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. 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 Columbia University, New York, NY
Unsupervised Learning Teaching Assistant 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 Columbia University, New York, NY
Machine Learning Teaching Assistant 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 BASIS Independent Brooklyn, New York, NY
Peer Tutor 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)

Awards

CRA Outstanding Undergraduate Researcher Award Finalist | CRA Fall 2025
Dean's List | Columbia University Fall 2022 - Spring 2025
Salutatorian | BASIS Independent Brooklyn Spring 2022
Honor Roll | BASIS Independent Brooklyn Fall 2018 - Spring 2022
7th Place at State Championship | New York City Urban Debate League Spring 2021
2 gold keys, 1 silver key, and an honorable mention | Scholastic Art & Writing Awards Spring 2020
Exhibited a photograph at The Metropolitan Museum of Art along with 250 works chosen from +10,000 submissions to Scholastic Art & Writing Awards
National AP Scholar | College Board Fall 2020