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- Authored an unpublished note proving the impossibility of constant-factor approximation for online bipartite matching with respect to the Nash Social Welfare function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. Under Review. 2025

Noah Bergam, **Szymon Snoeck**, and Nakul Verma. t-SNE Exaggerates Clusters, Provably. Under Review. 2025

Manuscripts

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

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

The Difficulty of Approximating NSW in Online Matching. **Szymon Snoeck**, Christopher En, Yuri Faenza. 2024

Deterministic Approximate Counting F2 Polynomials Via Correlation-based Fourier Bounds. **Szymon Snoeck**, Sam Wang. 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, create rubrics, write solutions, and grade homework

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, create rubrics, 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, Pandas, Adobe Photoshop, and Adobe Lightroom
Artistic: Photography, inking, and oil painting
Language: Dutch (Fluent), and French (Elementary Proficiency)

Awards

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