Alexandra Koletsos

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Education

Columbia University in the City of New York — New York, NY
Bachelor's in Computer Science and Mathematics — *Expected May 2025*
- GPA: 3.7/4.0
- Relevant Coursework: Artificial Intelligence, Natural Language Processing, Abstract Algebra, CS Theory, Advanced Programming in C, DS&A in Java

Norwalk High School — Norwalk, CT
High School Diploma — *Aug 2017 – Jun 2021*
- Awards & Honors: Valedictorian, Kevin M. Eidt Scholarship

Skills

Technical: Java, Python, C, Magma, LaTeX, Jupyter Notebook, VS Code, MS Office (Word, Excel, Powerpoint)
Languages: Greek, Spanish, English

Work Experience

Department of Mathematics, Texas A&M University-Commerce — Commerce, TX
Lead Undergraduate Researcher — *Jun 2023 – Aug 2023*
- Developed a unique construction of multidimensional circulant (MDC) graphs, a generalization of circulant graphs, using Magma, a computer algebra programming language
- Implemented an exhaustive search process for new quantum codes from MDC graphs via self-dual additive codes with Magma, resulting in the discovery of 7 new quantum codes
- Investigated graph-theoretic properties of MDC graphs to optimize original program's generation of quantum codes, thereby strengthening critical thinking and proof writing skills

Department of Mathematics, Columbia University — New York, NY
Head Calculus Teaching Assistant — *Jan 2023 – Present*
- Facilitate weekly office hours, providing one-on-one assistance to students with general and homework-specific questions related to all levels of calculus
- Create homework answer keys to evaluate students' work, grading over 300 problems per week

Personal Projects

Lexical Substitution Task | *Python, WordNet, Gensim, Word2Vec, DistilBERT, Tensorflow* — Nov 2023
- Refined the Lesk algorithm by incorporating examples, hypernym examples, and hypernym definitions for each synset of a target word in computing an aggregate overlap score with context to enhance WSD precision by 10%
- Leveraged WordNet to identify potential substitutes for a target word and selected the candidate with the highest prediction score in the target position using a pre-trained DistilBERT model

Dynamic Web Server | *C, HTML, Linux* — Dec 2022
- Constructed a server socket in C to efficiently handle multiple simultaneous HTTP GET requests from clients with forking
- Established a robust TCP connection between the web server and a MySQL database to fulfill HTTP/1.0 responses with real-time data
- Implemented an interactive HTML table to present search results, enhancing user experience and data accessibility

Publications & Presentations

P. Seneviratne, H. Cuff, **A. Koletsos**, K. Seekamp and A. Thananopavarn, *New Qubit Codes from Multidimensional Circulant Graphs*, arXiv preprint, https://arxiv.org/pdf/2309.01798

Activities & Leadership

Columbia Women's Ultimate Frisbee Team — New York, NY
Logistics Coordinator — *Sep 2022 – Present*
- Dedicate 12 hours per week to practice and team meetings year-round, with weekend-long tournaments in the spring
- Plan and manage the $10,000 club annual budget, coordinating local and out-of-state tournament-related expenses

Community Impact, Columbia University — New York, NY
GED Math Teacher, Head After-Hours Tutor — *Sep 2021 – May 2022*
- Developed unique GED test-prep curriculum to prepare low-income adults in NYC for the high school equivalency exam
- Maintained over 80% attendance throughout the semester and organized one-on-one tutoring sessions tailored to the preferred learning style of each individual student

Jumpstarting Aspiring Developers and Entrepreneurs — New York, NY
Selected Student Member — *Dec 2021 – Jan 2022*
- Attended web-dev workshops in HTML, CSS, and JS, and applied these skills to develop my own personal website
- Visited Fortune 500 companies, attending Q&A panels with company CEOs and engineers to discuss impactful real-world applications of CS

Additional Information

Awards & Honors: Dean's List (×3), Columbia University Student of the Month (April 2023), Columbia University Class of 1956 Alan N. Miller Scholarship, Joint Mathematics Meeting Presenter
Other Activities: First-Generation and Low-Income Partnership (FGLIP), Columbia New Student Orientation Leader