Adiba Ejaz

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EDUCATION

Columbia University, New York, NY May 2023

B.A. in Computer Science and Mathematics (GPA: 3.926. Dean's List.)

CS coursework: Advanced Programming* (*Unix, C).* Fundamentals of Computer Systems*. Data Structures (*Java*)

Math coursework Modern Algebra I*. Discrete Mathematics*. Honors Mathematics A and B (multivariable calculus and linear algebra).

GEMS Modern Academy, Dubai, UAE May 2019

IBDP (GPA: 45/45, SAT 1570 800 Math 770 Verbal, 800 Math II). *Valedictorian. KS Varkey Scholarship.*

* this semester

SKILLS

- **Programming languages:** Java (proficient), Python (proficient), JavaScript, HTML, CSS.
- **Technologies & frameworks:** Git, LaTeX, MongoDB, Express.js, React.js, Node.js, Mathematica
- **Natural languages:** Trilingual in English, Urdu, Hindi. Semi-fluent in French.

PROFESSIONAL EXPERIENCE

Undergraduate Researcher. The Billinge Group, Columbia University. New York, NY May 2020-Present

Software development for Department of Applied Physics and Applied Mathematics.

- Authored and maintained multiple *Python* scripts using test-driven development in *pytest* for Regolith, a *NoSQL* research group database management software, and reviewed other members' projects
- In team of 3, spearheaded development of web app using *MERN* stack to replace Regolith CLI for improved usability
- Built *matplotlib* tool to analyze grant burn and project future expenditure to balance budget, reducing runtime of previous component functions by over 40%

Technical Intern. Dubai Future Accelerators. Dubai, UAE March 2018

- Researched and proposed regional applications of start-up PowerIn.Space's wireless energy transfer technology in delivery drones and defibrillators for disaster relief
- Comparatively evaluated performance of start-up STAQU's machine-learning algorithm for speaker recognition

LEADERSHIP AND ACTIVITIES

Technology Director, *Columbia Superposition*
Chapter of national non-profit developing CS pedagogy for women in computer science.

Team Liaison, *Columbia Debate Society.*
Cornell finalist. Top 5 individually at CUNY and American University. World Schools UAE National Team.

Directed reading program, *Association for Women in Math.*
Gave 3 talks on simple random walks**.** Built Gambler's ruin simulation (on GitHub).

Directed reading program, *Undergraduate Math Society*
Markov chains and random walks on graphs.

RESEARCH

Spectral graph theory applied to topological data analysis. *Columbia University.* May 2020-Present

Research under Professor Simon Billinge and Adjunct Scientist Michael Waddell in the Applied Physics and Mathematics department on developing an algorithm to extract homologies and filter noise of high-dimensional datasets using the Laplacian matrices of their persistence graphs.

On the partitioning of n-spheres. *International Baccalaureate.* May 2018-19

Computational geometry research paper arriving at a result enumerating the optimal partitioning of *n*-dimensional spheres by hyperplanes. Grade A (awarded to top ~10% of candidates).