# William Zheng

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## Education

**Columbia University** *New York, New York*

Bachelor of Science in Applied Mathematics and Minor in Computer Science, *GPA: 3.87/4.00, Dean's List* *May 2021*

- Relevant Courses: Numerical Methods, Algorithms, Stochastic Systems, Machine Learning, Financial Engineering

## Experience

**Morgan Stanley**

**Summer Technology Analyst: Investment Management** *June 2019-August 2019*

- Developed a full stack Angular based data visualization tool for portfolio managers; built ML-based tools (decision trees, ada-boosted decision trees, unsupervised clustering w/ multi-dimensional scaling) as proof of concept tools for analysis.
- Collaborated with international teammates in an agile framework; implemented clean code practices and version control.
- Created and delivered a presentation of both projects to the head of Investment Management and Executive Directors.

**Lionbase LLC**

**Associate Team Lead** *June 2019-August 2019*

- Lead a team of four data scientists to develop a full stack platform; met weekly with clients to discuss design and use cases.
- Developed tools with NLP and tree-based classifiers to build a classification pipeline.

**Basov Infrared Laboratory**

**Undergraduate Researcher** *Sept 2017-Present*

- Presented at IEEE (MIT URTC) and APS March Meeting (Largest Condensed Matter Physics Meeting) conferences.
- Modeled phase transitions and solved partial differential equations for simulating plasmons with Finite Element Methods.
- Built robust data-processing pipelines and optimized techniques for simulation and analysis to explain experimental results.

**Materials Research Science and Engineering Center**

**Researcher** *May 2018-August 2018*

- Worked independently under the guidance of a post-doctorate mentor as a part of a selective physics research program.
- Developed a suite of analytical tools including a Bokeh based numerical simulation app to guide novel experimental work.
- Performed novel Principal Component Analysis (PCA) + k-Means analysis on Hyper-Spectral data for future publication.

## Achievements

**UChicago Midwest Trading Competition First Place,** *Case 3*: *Best Optimal Portfolio Allocation Algorithm* 2019
**Best use of Google Cloud API,** *DevFest @ Columbia University* 2019
**Best use of Kensho Knowledge API** , *HackMIT* 2018
**2019 NYC Marathon Finisher,** *(9+1 Program)* 2018
**ISWEEEP Gold Medal**, *International Sustainable Engineering Energy Environment Project Olympiad*, *Engineering Category* 2017
**NYSSEF First Place,** *New York State Science Engineering Fair* 2017
**USACO Gold Division,** *United States Coding Olympiad* 2017
**AIME Qualifier,** *American Invitational Math Examination* 2015-2017

## Projects and Interests

**Halycon:** Financial toolbox with functions for pricing options with binomial tree/control variate approach and a portfolio optimizer
**Fokker Planck Solver:** Comparison of different finite difference methods for solving the Fokker-Planck equations for (2+1) variables
**Interests:** Running, CAD + Building a Hexacopter, Research, Teaching, Probability, Numerical Methods

## Activities

**Columbia Data Science Society: Executive Board Member** *Sept 2018-Present*

- Planned Data Science events each week with a committee to reach both the undergraduate and graduate community.
- Wrote a weekly newsletter with 3800+ subscribers on events, opportunities, articles, and interview questions.

**Society for Industrial and Applied Mathematics: President and Instructor** *Sept 2018-Present*

- Taught High Schoolers various topics in coding and numerical methods as part of a year-long coding bootcamp.

**National Museum of Mathematics: Volunteer and Docent** *Jan 2016-June 2018*

- Communicated complex mathematical concepts for a large audience; organized and oversaw events with other docents.
- Presented 40+ exhibits for 300+ guests daily spanning topics from calculus of variations to probability and statistics.

## Skills

**Technical Skills:** Python, Java, Angular, SQL, Agile, FEniCS, D3.JS, Scala, Google Big Query, Linux/Mac/Windows, C, C++
**Languages:** Spanish (Intermediate), Chinese (Conversational)

## Publications and Presentations

**Presentations:** Bokeh Application for Modeling Plasmons with Finite Element Method. Poster Presented at IEEE MIT URTC Conference, Boston, MA 2018; X-ray hyperspectral classification of the metal-insulator transition in NdNiO3. Oral Presentation at APS March Meeting. Boston, MA 2019

**Papers:** Rigorous numerical modeling of scattering-type scanning near-field optical microscopy and spectroscopy. In: Applied Physics Letters 111 (2017). http://dx.doi.org/10.1063/1.5008663. – DOI 10.1063/1.5008663