

# Antong Cheng

antong.cheng@nyu.edu • 425-922-5788 • linkedin.com/in/at-cheng • github.com/AntongC • antongcheng.com

## EDUCATION

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**M.S., New York University, Courant Institute of Mathematical Sciences, GPA 3.8** New York, NY

Areas: Applied Computational Mathematics *Sep 2021 - May 2023*

- **Courses:** Probability Theory, Machine Learning Theory, Stochastic Numerical Linear Algebra, Statistical Physics, Convex and Non-Smooth Optimization, Scientific Computing, Numerical Methods

**B.S., Cum Laude, University of Washington, GPA 3.9** Seattle, WA

Areas: Mathematics, Computer Science

*Mar 2017 - Jun 2021*

- **Courses:** Data Structure and Algorithms, Operating Systems, Probability, Statistics, Numerical Analysis, Computer Simulation, Discrete Mathematics, Machine Learning

## WORK EXPERIENCE

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**Software Engineer Associate – Commercial Tech** New York, NY

**Capital One Financial**

*Aug 2023 - Present*

- Developed and maintained pricing model to assess profitability of more than 6000 commercial clients and calculate their net present values
- Engineered statement generation microservice to standardize and combine operations of consumer, commercial, and small business banking

**Software Engineer Intern – Enterprise Data and Machine Learning** McLean, VA

**Capital One Financial**

*Jun 2022 - Aug 2022*

- Designed low latency AWS AppSync GraphQL API endpoint fetching data from multiple databases including AWS DynamoDB, AWS Aurora, and AWS Lambda functions connected to third party databases
- Integrated caching layer to improve performance by 50% compared to existing RESTful API
- Presented proof of concept to directors and intern cohort

**Graduate Teaching Assistant – Math for Economics I and II** New York, NY

**NYU Courant**

*Sep 2021 - May 2023*

- Instructed 2 recitation sections of 60 students per week for fast-paced survey course on Microeconomics, Calculus, Linear Algebra, Differential Equations, and Optimization

## PROJECT & RESEARCH

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**Algorithmic Stability and LOOCV Bounds** *Jan 2023 - May 2023*

- Surveyed definitions of algorithmic stability and proved theorems that guarantee leave-one-out cross validation bounds of machine learning algorithms, such as decision trees and neural networks
- Implemented machine learning algorithms and compared experimental results against theoretical max error

**Fast Algorithms in Scientific Computing** *Sep 2021 - Dec 2021*

- Implemented numerical integration methods using adaptive quadrature of first to fourth order convergence
- Computed large-scale illumination from light sources using SVD low rank approximation on linear system
- Resolved overdetermined systems using QR decomposition in least-squared problems
- Enhanced Newton's Method with modified Cholesky's decomposition and line search to improve basin of convergence on optimization problems

## SKILLSET & INTEREST

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**Programming Languages and Software:** Python, Java, C++, Julia, MATLAB, JavaScript, Git

**Language:** Mandarin (Native), English (Bilingual), Japanese (Intermediate)

**Interests:** Spinning Studio, Go and Gomoku, Golf, Badminton, Strategy Games