Gordon Lu

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Research Interests

- ML and Data Science
- Algorithms and Theory
- Quantum Computing
- Security and Cryptography
- Natural Language Processing
- Discrete Mathematics

Education

University of Pittsburgh, Honors College   **August 2017 – May 2022**

Bachelor of Science in Computer Science, Economics, Mathematics, Statistics

Relevant Coursework

- Algorithms
- Machine Learning
- Deep Learning
- Computer Organization
- Systems Programming
- Operating Systems
- Data Science
- Database Management
- Computer Vision
- Computer Networks
- Cloud Computing
- Multivariable Calculus
- Discrete Mathematics
- Theoretical Calculus
- Abstract Algebra
- Graph Theory
- Combinatorial Math
- Quantum Computing
- Linear Algebra
- Differential Equations
- Advanced Calculus
- Financial Econometrics
- Mathematical Statistics
- Probability Theory
- Applied Regression
- Statistical Learning
- Bayesian Statistics
- Financial Economics
- Game Theory
- Microeconomics
- Macroeconomics
- Econometric Theory

Experience

Capital One Financial Corporation   **August 2022 - Present**

Associate Software Engineer   *Richmond, VA*

- Data Privacy Management for Crucial Confidential Applications at Capital One.
- Using Java SpringBoot Framework alongside Maven, testing with Karate Framework.
- Applications hosted on AWS. AWS services used: Lambda, ELB, ECS, S3, Amazon RDS, EFS, etc.
- Application Monitoring via Splunk, PagerDuty, DataDog.
- Said applications are used heavily in daily operations.

Capital One Financial Corporation   **May 2021 – August 2021**

Software Engineering Intern   *Virtual*

- Cloud and Productivity Engineering for application recovery to efficiently handle disaster recovery.
- Built a Serverless Web Application hosted on EC2 using Lambda functions to interact with DynamoDB.
- Utilized Angular JS, Typescript to implement Front-end functionality. (Bulma was the primary framework)
- Implemented Back-end functionality using Node.js, Python Flask.
- Said application greatly increases application availability for important applications used in daily operations

University of Pittsburgh   **August 2019 – May 2022**

Undergraduate Teaching Assistant   *Pittsburgh, PA*

- Was a teaching assistant for the Computer Science, Economics, Mathematics, and Statistics departments.
- Curated lab materials and developed grading scripts using Python and Bash scripts.
- Instructed weekly recitations and held numerous review sessions to explain complex topics.
- Maintained a 5/5 rating from students.

Lumentum Holdings Inc.   **May 2019 – August 2019**

Quality Engineer Intern   *San Jose, CA*

- Optimized and developed SQL and Python scripts to retrieve and filter data.
- Used ODBC drivers to establish connection with databases and Python.
- Implemented WinSPC software to monitor and provide fast, efficient data analysis.
- Developed an auto-reporting system to monitor C_{pk} and P_{pk} values.

Premium Technology Inc.   **May 2018 – August 2018**

Software Engineer Intern   *New York City, NY*

- Lead developer in website: **premiumit.com**
- Aided in research to provide continuous improvement on the supply chain system, to simplify the ease of usage on client-side.

Teaching Experience:

I have been a teaching assistant for the following courses:

CS 0007 | *Introduction to Computer Programming in Java* **Fall 2019, Spring 2020**

CMPINF 0401 | *Intermediate Java Programming* **Fall 2019**

CS 0447 | *Computer Organization and Assembly Language* **Fall 2019, Fall 2020**

CS 0449 | *Introduction to Systems Software* **Spring 2020, Summer 2020, Fall 2020, Spring 2021**
- Led weekly recitation with 20+ students to review and provide aid in difficult concepts.
- Concepts included Floating Point Representation, Memory Managment in C, Processes and Threads, Caches
- Designed numerous study guides for exams, with 30+ pages for each study guide
- Hosted multiple 5+ hour review sessions to aid students in preparing for exam
- Review sessions increased the overall average grades by around ten percent
- Work closely with Professor to design new labs and improve course
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help

CS 1501 | *Algorithm Implementation* **Fall 2021, Spring 2022**
- Led weekly recitation with 10+ students to review and provide aid in difficult concepts.
- Concepts included Trees, Compression, Priority Queues, Graph Algorithms, Dynamic Programming
- Work closely with professor to provide feedback regarding course improvement and student feedback
- Hosted multiple 5+ hour review sessions to aid students in preparing for exam.
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help

CS 1555 | *Database Management Systems* **Spring 2021**
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help
- Concepts included but not limited to: DB Design, ER to Relational, DB Normalization, Transaction Processing
- Work closely with professor to provide feedback and grade assignments from students

CS 1656 | *Introduction to Data Science* **Fall 2021**
- Led weekly recitation with 10+ students to review and provide aid in difficult concepts.
- Concepts included but not limited to: Data Mining, Python Data Science Libraries, Cluster, SQL, Recommender Systems, Page Rank / Network Analysis, Data Visualizations
- Work closely with professor to provide feedback regarding course improvement and student feedback
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help

ECON 0110 | *Introduction to Macroeconomic Theory* **Fall 2020**

ECON 1100 | *Intermediate Microeconomics* **Spring 2021, Summer 2021**
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help
- Concepts included but not limited to: Constrained Choice Theory, Demand Theory, Cost Theory and Wealth Maximization, Efficiency, Imperfect Competition
- Work closely with professor to provide feedback and grade assignments from students

ECON 1440 | *Economics of Corporate Finance* **Fall 2019, Fall 2020, Spring 2022**
- Host office hours that spanned 4+ hours up to midnight to ensure all students received necessary help
- Concepts included but not limited to: Financing of Corporations, Cash Flows Valuation, Capital Budgeting, Risk, Return, CAPM model
- Work closely with professor to provide feedback and grade assignments from students

STAT 1331 | *Financial Econometrics* **Fall 2021**
- Host office hours to aid students with complex topics
- Concepts included but not limited to: Univariate and Multivariate Time-Series methods, GARCH and ARCH models, ARMA / ARIMA, MA, AR models, Forecast Volatility
- Work closely with professor to provide feedback and grade assignments from students

MATH 0031 | *Algebra* **Fall 2021**

Projects

PittTours | *Java, PostgreSQL, JDBC*   **November 2020**
- Implemented an imaginary flight reservation system.
- Developed a set of triggers, procedures and ACID transactions in PostgreSQL.
- Utilized Dijktra's Algorithm and other graph algorithms to find the routes between cities in Java.

Automated Hyperparameter Tuning | *Matlab*   **April 2021**
- Used Bayesian Optimization to find optimal hyperparameters to enhance accuracy for an image classification task.
- The Bayesian Optimization was performed on a classification network and a fine-tuned transformer after data augmentation.
- This improved accuracy on the testing data and reduced overfitting on the training data.

Pokémon Trainer | *Python*   **April 2021**
- Implementated reinforcement learning using Deep Q-Learning and an epsilon-greedy policy to win Pokémon battles.
- The model achieved a win rate of 0.95 to other novel approaches.

Technical Skills

Languages: Python, Java, C/C++, R, HTML/CSS, SQL, MIPS, x86, Matlab, Haskell
Libraries: PyTorch, TensorFlow, Keras, scikit-learn, Natural Language Toolkit, pandas, numpy, matplotlib
Statistical Software: Stata, JMP, Minitab
Other: Linux, GitHub, VS Code, Atom, LaTex

Leadership / Extracurricular

Business Manager, Computer Science Club	May 2020 – May 2021
President, Data Analytics Through Applied Statistics	May 2021 – May 2022
Business Manager, Pitt Math Club	May 2021 – May 2022