

# Shun Guo (Sean)

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## EDUCATION

**Duke Kunshan University (DKU) & Duke University** **Kunshan, China & Durham, USA**  
*B.S. in Applied Math & Computational Science - Math Concentration* **Sep 2019 - Dec 2023**

- **GPA: 3.454 / 4.0**
- **Major Coursework:** Calc, Multivariable Calc, Prob & Stats, Complex Variable, Linear Algebra, Adv Linear Algebra, Intro Programming & Data, Numerical Analysis, Real Analysis, ODE & Dynamical Systems, Intro Applied Math, Intro PDE, Math of Machine Learning, Math Modeling with Writing, Data Structure, Stochastic Process, Algorithm and Database.

**Duke University** **Durham USA**  
*MEng in Fintech* **Aug 2024 - May 2026**

- **GPA: 4.0 / 4.0**
- **Major Coursework:** Programming for Fintech, Fin Inst Products and Services

## COMPUTER SKILLS

**Programming languages:** Python (advanced), Java (intermediate), C/C++ and SQL (SQLite).

**Tools & OS:** Mathematica, MATLAB, Photoshop, Premiere Pro, Illustrator, Maya, Markdown, and LaTeX; Windows, Linux-Debian, and MacOS.

## PROFESSIONAL EXPERIENCES

**Tenneco, Inc.**, Hardware Driver Engineer | Intern | Supervisor: Mazon Chen **March- Jun 2024**

- Develop a PID algorithm to control the urine pump in the Selective Catalytic Reduction with C.
- Helped test and debug the controller for the urea pump in their post-processing system

**CITIC Securities**, *Analyst & fintech developer* | Onsite internship | Supervisor: Minghua Shen & Zhenyu Xu **Jul- Aug 2022**

- Developed a data crawler in Python to acquire company data with recent private placement plans daily.
- Developed a chatbot on Wecom using Nonebot asynchronous messaging framework to push the daily result to my supervisor.
- Collected data from listed companies in CSI 1000 Index with Choice API to analyze their stock performances.
- Drafted reports based on analyses on business and shareholder compositions, market, capital operations, and industrial chain.

**Google LLC**, *Data Engineer* | Remote part-time assistant | Supervisor: Helen Chen **Jul- Aug 2022**

- Cleaned customer-advertisement-related click and consumption data and concatenate them into an SQLite database.
- Created sub-tables sorting by customer and advertisements demographic data for further market analysis.
- Labeled data with RFM model and created clusters by price using K-means, analyzed the customer and advertising structure.

**CICC**, *Quantitative Analyst & Developer* | Remote part-time assistant | Supervisor: Huajie Chen **Jun- Jul 2021**

- Acquired, analyzed, and visualized historical transaction data within the CSI300, CITIC Primary Industry, SZSE Component, SSE SME Composite Index to evaluate market performances in Python, and detected the Calendar Effect.
- Created an analytical module that could evaluate the performance of a given list of public offering funds in Python.

## ACADEMIC RESEARCH

**North Carolina business study for NC Bankers Association** **Oct 2024- Dec 2024**

- Accessed data with web scrapping technology powered by selenium in Python. Over 300k lines of business data are obtained.
- Analyzed the data based on their number of employees and annual sales. Calculated related statistics and visualized them on map with Geoplot. Stratified businesses for deeper insight.

**Chatbot development based on BERT NLP prediction and VITS audio synthesizing** | A school research **Aug 2022- May 2023**

- Built a cross-platform chatbot based on Nonebot using BERT for NLP prediction and VITS for audio synthesizing.
- Improved the extendable chatbot framework with basic function of receiving and sending messages.
- Collected languages corpus data for VITS training, cleaned and transferred the English model for Chinese and Japanese.

**Numerical PDE** | A summer group seminar **Jun 2022 - Aug 2022**

- Targeted to solve a 2- or 3-dimensional Heat Equation with Dirichlet Boundary Condition and no analytical solutions.
- Solved 1-dimensional Poisson equation numerically with Dirichlet, Neumann and mixed Boundary Conditions verified its accuracy with analytical solutions. Reduced the algorithm time complexity to  $O(N)$  using the Thomas algorithm. Solved 2-point boundary value problem with Newton's method. Solved a 2-dimensional elliptical equation using 5- and 9-point stencils.

**Audio and Image processing using the Fast Fourier Transformation (FFT)** | A school lab project **Nov 2020 -Dec 2021**

- Built an analog audio system in Python using SCIP and NumPy to have realized noise reduction works by using FFT.
- Studied the algorithm by analyzing the application FFT used in audio and image processing with Julia FFTW and WAV.
- Established a high-pass filter that could pass certain signals with cutoff frequencies and be used for future audio processing.

**Numerical analysis on the Wilson-Cowan neuronal network dynamics** | A school lab project **Sep 2020 - Nov 2021**

- Analyzed the conditions of neural oscillations without external stimulus using Poincaré-Hopf and Bendixson-Dulac theorem.
- Simulated the performance of Wilson-Cowan model under various parameters with Mathematica and Python.
- Explored the conditions of neural network oscillations to a certain amount of independent or interactional stimulus.

## EXTRACURRICULAR ACTIVITIES

**Founder & Finance Manager** (*ACG Club of DKU*): Connected external sponsors, organized club activities **Feb 2020 - present**

**Member & Debater** (*Debate Club of DKU*): primary debater in 10+ events, peer-tutor and member recruiter **Sep 2019 - present**

**Member** (*Committee of Artistic Music Festival of DKU*): coordinated musicians, assisted during concerts **Dec 2019 - Feb 2020**

## OTHER INFORMATION

**Languages:** Chinese Mandarin (native), **English** (proficient), and **Japanese** (conversational).

**Certificates:** Machine Learning (by *Stanford*); Python Data Structure; Computer Science: Algorithms, Theory, and Machines; Computer Science: Programming with a Purpose (by *Princeton University*), Moral Foundations of Politics (by *Yale*). CFA Lv2. Candidate.

**Personal Interests:** logic studies, debate, graphic design and illustration, web design, and modding for games.