# Alexander Davison

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## EDUCATION

**Stony Brook University** **Stony Brook, New York**

Bachelor of Science in Mathematics, Minor in Computer Science *Expected May 2028*

Dean's List, Presidential Merit Scholarship

Relevant Coursework:
- CSE 214: Data Structures
- CSE 216: Programming Abstractions
- CSE 371: Logic
- MAT 303: Calculus IV with Applications
- MAT 310: Linear Algebra
- MAT 313: Abstract Algebra
- MAT 324: Real Analysis

**Roger Williams University** – Distance Calculus, Calculus III **2022-23**

**Cary Christian School** – Dean's List with Distinction **2021-24**

**AlphaStar Academy** – USACO Silver **2016-17**

**SAT** – 1480 twice, 1490 superscore

**AP Scholar with Distinction** – AP Calculus BC, AP Computer Science A, AP Statistics, AP Physics, AP Biology, AP Environmental Science

## TECHNICAL SKILLS

- **Languages:** Python, C/C++, Rust, OCaml, HTML/JS, SQL
- **Tools:** NumPy, Matplotlib, PyTorch, Git
- **Skills:** Scripting, Web Scraping, Machine Learning, NLP, Mathematical Modeling, Data Visualization, Numerical Analysis, Formal Verification, Algorithm Design

## RELEVANT EXPERIENCE

**Thales Academy** **Cary, North Carolina**

Software Developer (Contracted) *June 2024 – August 2024*
- Developed a web app in HTML/JS for Thales Academy teachers to automate the generation of math worksheet PDFs

## PROJECTS

**Personal Projects**
- **Conway's Game of Life** **2018**
  - Interactive Conway's Game of Life simulation in Python/PyGame
- **Bezier Curve** **2019**
  - Interactive Bezier curve simulation in Python/PyGame
- **Mandelbrot Set** **2020**
  - Mandelbrot Set fractal image and video rendering in Python, then reimplemented in C++

- **Sierpinski Triangle** **2020**
  - Sierpinski Triangle fractal image rendering in Python
- **EOcross Solver** **2022**
  - Front-end Rubik's cube solver for the EOcross step, using a novel algorithm
  - Solving algorithm later adopted by the **CrystalCube** project, https://crystalcuber.com/
- **ChessDB Mobile** **2023**
  - Mobile front-end interface for exploring chess openings in HTML/JS
  - Statistics and evaluation data pulled from chessdb.cn and lichess.org APIs
  - Original codebase that the **ChessPath** project was later built on, https://chesspath.pro/
- **Weiqi Engine** **2024**
  - Go board game Monte Carlo tree search engine in C++ for expression evaluation and reduction
- **Lambda Calculus** **2024**
  - Untyped lambda calculus compiler in C++
- **Rubik's Cube Rendering** **2025**
  - 3D Rubik's Cube renderer in C
- **YouTube Scraper** **2025**
  - Python scripts to automate scraping of YouTube channels and all of their videos
  - NLP processing on each video and automated extraction of named entities

## STUDENT ENGAGEMENT

**Hackathons**

- **HackNYU 2025** **2025**
  - Put together and led a four-person team
  - Led brainstorming and project planning sessions
  - Developed front-end user profile UI in Pythonstreamlit
  - Developed back-end database support using Python/sqlite3
  - Merged all contributors' work in Git to produce finalized project

**United States of America Computing Olympiad (USACO)** **2017**

- Competed in Bronze division

**DataAnnotation** **2023-25**

- Freelancing work in revising Python, HTML/JS, Java, and C/C++ code written by AI models and developers

**Math Tutoring** **2023-24**

- Tutored several students weekly on subjects ranging from pre-algebra to AP calculus

**Competitive Chess** **2016-24**

- Won 1st place at 2020 US National Junior Chess Congress at Santa Clara for my rating division
- Represented the Stony Brook chess team against Yale at Yale Invitational Chess Tournament 2024

**Chess Club, Cary Christian School** **2022-24**

- Led Cary Christian School chess club as president
- Organized tournaments with other schools

**Band, Cary Christian School** **2022-24**

- Awarded Director's Award of Excellence, performing F horn and trumpet

**Varsity Tennis, Cary Christian School** **2022-24**

- Competed at 1st seed singles and 2nd seed doubles