

# Alex Liu

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## EDUCATION

- University of Florida, B.S. Computer Science, Minor in Geography** GPA:3.80/4.0 | Gainesville, FL
- **Award:** Dean's List | Expected Graduation: May 2028
  - **Relevant Coursework:** Computer Organization, Linear Algebra, Data Structures and Algorithms, Programming Fundamentals 2, Discrete Structures, Calculus 3

## SKILLS

- Programming Languages:** Python, C++, C, Java, Rust, C#, Bash, SQL, RISC-V Assembly  
**Web & Software Development:** React, Node.js, HTML, CSS, Javascript  
**Technical Tools:** Git, Linux, MATLAB, Photoshop

## EXPERIENCE

- Instructor, Logic Lab** Jun 2022 – Jul 2022 | Gainesville, FL
- Led and instructed a class of **30+** students in math and chess, designing lesson plans, and building basic skills.
  - Created engaging materials and adapted teaching methods to foster critical thinking and problem-solving.
  - Managed classroom dynamics and evaluated progress to refine instructional strategies.

## PROJECTS

- Grade Track, Flask, React.js, SQLAlchemy, PostgreSQL, Docker** Oct 2025
- Engineered a full-stack analytics dashboard that visualizes student performance trends across courses using Flask APIs, React, and Recharts
  - Orchestrated containerised deployment with Docker Compose, reducing setup time by 85% and ensuring consistent cross-environment builds.
  - Integrated real-time data aggregation and visual analytics to demonstrate mastery of backend design, database modeling, and frontend interaction.
- Ability Bridge, Python, OpenCV, MediaPipe, PyAutoGUI** Sep 2025
- Developed a real-time facial-gesture control system processing over **14,000** facial landmark points/sec to enable hands-free computer interaction for users with limited mobility.
  - Designed and optimized 3D head-pose cursor mapping, adaptive mouth-motion Morse decoding, eyebrow-raise click detection, and duration-based blink commands, achieving **30 FPS with < 100 ms latency**.
  - Implemented dynamic calibration, exponential smoothing, and hysteresis-based signal processing to improve gesture precision and reduce false activations across diverse lighting and facial conditions.

- Best-Fit / First-Fit bin packing, C++** Jul 2025
- Developed two bin-packing algorithms, processing **100,000+** rectangles by First-Fit and Best-Fit to quantify trade-offs in runtime and space efficiency with dynamic data structures.
  - Architected an object-oriented framework to streamline placement logic and maximize spatial optimization.

- Minesweeper Game, C++, SFML** Apr 2025
- Engineered a 350+ tile fully interactive Minesweeper game from scratch, featuring recursive reveal, flagging, pause/debug modes, timer, and a dynamic leaderboard showing top 5 scores.
  - Architected object-oriented systems for grid generation, user interaction, and UI rendering using SFML.
  - Implemented persistent leaderboard logic with file I/O to track & display top scores, enhancing the gameplay.

## LEADERSHIPS & ACTIVITIES

- UF Society of Asian Scientists & Engineers, SASE intern** Aug 2024 – Present | Gainesville, FL
- Planned a professional event for **150+** attendees, dedicating **30+** hours to programming and engagement.
  - Collaborate with **100+** members on ongoing initiatives, building skills in planning and communication.
  - Expand professional networks through mentorship programs, strengthening leadership & career opportunities.

- UF Chinese American Student Association, Event Committee Member** Oct 2024 – Present | Gainesville, FL
- Spearheaded a culture Festival for **300+** participants, investing **30+** hours to coordinate & program.
  - Authored, curated, and executed cultural activities to elevate engagement and celebrate Chinese heritage.