Jayden Lin

Boston, MA · lin.jayd@northeastern.edu · jaydenlin.net · GitHub · LinkedIn

Education

Northeastern University — Boston, MA
B.S. in Mathematics and Computer Science — *Expected May 2029*

Notable Coursework: Graduate Real Analysis, Advanced Linear Algebra, Advanced Probability & Statistics, Graph Theory, Theory of Computation · Full coursework

Research

Maximum Intersections of Two Simple Heptagons — 2026–Present
Independent research with faculty feedback — TheoremDB submission

- Investigated $f(7,7)$, the maximum number of boundary intersections between two simple seven-sided polygons and the smallest open case of the Dillencourt–Mount–Saalfeld conjecture.
- Developed a candidate proof that $f(7,7) = 38$: formalized the vertex-disjoint upper bound in Lean 4 and exhibited 38 intersections; the general case relies on a published reduction not yet formalized.
- Built exact-arithmetic Python checkers, an independent C++ case analysis, and CI that rebuilds the Lean proof and audits its axioms.

Projects

zipc — Parallel ZIP Compressor *Rust, Tauri, Zopfli*

- Built a parallel ZIP compressor with desktop and CLI tools (compress, test, list, extract, diff) sharing one Rust engine and producing deterministic, byte-identical archives.
- On Apple M1 benchmarks, ran 4–11× faster than Finder at comparable size and 2–13× faster than `zip -9` at matched size; skips incompressible data to cut CPU use 2.5–8×.

Fly Simulator — Brain-Driven Virtual Fruit Fly *Python, MuJoCo, FlyGym*

- Extended existing FlyWire-derived connectome and FlyGym/MuJoCo body simulations with custom sensory-driven tasks and experimental conditions.
- Evaluated navigation behavior: 15/16 successful ring traversals in one configuration versus 0/16 with swapped eyes.

Prove It! — Multiplayer Bluffing Game *Next.js, Socket.IO, Turso, Fly.io* — Live site

- Built and launched a real-time bluffing game with duels, 2–8 player races, solo, daily, and geography modes; curated 11,533 verified answers across 272 categories.
- Engineered WebSocket multiplayer with matchmaking, reconnection, spectating, and leaderboards; added test-gated deployments and an automated server cost guard.

Wavelength — Multiplayer Party Game *TypeScript, Next.js, WebSockets, SQLite* — Live site

- Rebuilt Wavelength as a server-authoritative online game with shared, fuzz-tested client/server logic for responsive gameplay without trusting client-submitted outcomes.
- Isolated the hidden answer in a separate database table with clue-giver-only access; automated four-browser tests check page content, network traffic, and storage for leaks.

BLEh — DIY Bluetooth Tracker *ESP32, C++, Rust, Tauri, SvelteKit* — *HackUMass, Fall 2025*

- Built an ESP32 Bluetooth tracker with a teammate and an iOS/Android app for mapping sightings and ringing the tag.

ESP32 Game Controller *C++, Python*

- Assembled a two-joystick, 16-key ESP32 game controller with 3D-printed components and a Python driver that maps inputs to keyboard and mouse actions.

Technical Skills

Languages: Python, Java, TypeScript, JavaScript, Rust, C++, Lean 4, SQL, HTML/CSS, LaTeX
Frameworks: React, Next.js, Node.js, Express, Socket.IO, Tailwind CSS, Tauri, SvelteKit, Mathlib, MuJoCo
Tools: Git, GitHub Actions, Docker, Fly.io, SQLite / libSQL (Turso), PlatformIO (ESP32)

Competitions & Activities

Competitions: William Lowell Putnam Mathematical Competition (2025); AIME (2025); AMC 12 (2023, 2024)
Activities: HackUMass (Fall 2025); competitive speedcubing, WCA profile (2026LINJ01) (3×3×3 best solve: 7.82 s)