Zach James

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EDUCATION

Louisiana State University **Baton Rouge, LA**

BS in Mathematics, BS in Computer Science, Minor in Psychology (GPA: 3.45) *Graduation Date: May 2026*

- Organizations/Awards: Honors College, Dean's List, President's Honor Roll, S&B Engineers Scholarship, LSU ICPC Competitive Programming team, CTO of LSU Digital Assets Club, Startup LSU
- Selected Coursework: Abstract Algebra II, Applied Optimization Theory, Numerical Linear Algebra, Operating Systems, Object Oriented Design in C++, Computer Networks, Malware Analysis, AI, ABA, Math Stats

WORK EXPERIENCE

LSU Department of Mathematics **Baton Rouge, LA**

Undergraduate Research Assistant *May 2024 – March 2026*

- Undergraduate Research Assistant (NSF-Funded TDA Project) Jun 2025 – Feb 2026
  Researched TDA complex construction and various embeddings
- Undergraduate Research Assistant - Clinical ML Project May 2024 – Aug 2025
  Trained supervised (RF, XGB, Lin/Poly, SVR/LSSVR, 2LNN) & semi-supervised (p-Laplacian) algs on compute clusters on biomarker data

Brick Bridge Consulting **Louisville, KY**

Software Developer *December 2022 - January 2024*

- Designed and independently delivered HRM, billing, and financial systems for medical staffing firm using JavaScript and Podio workflow automation
- Built internal analytics dashboards and metrics tools for influencer management firms: invoice generation with regional tax logic, rate card calculators, and financial reporting
- Developed multi-interface CRUD application for medical summary startup serving law firms (PHP API integrations, HTML/CSS frontend, leveled access control)

LSU Division of Computer Science & Engineering **Baton Rouge, LA**

Undergraduate Teaching Assistant *December 2022 - May 2024*

- Supported 100+ students per semester in Java programming labs; graded assessments, proctored exams, and provided one-on-one tutoring
- Built freelance websites for clients while maintaining full academic and research load

Projects

Thymos ***C/CUDA ML Library***

- Architected zero-dependency C/CUDA machine learning framework using 14-op prop IR and category-theoretic design; targets efficient training/inference on compute clusters and embedded systems (Jetson Orin)
- Implemented functorial backends, deterministic arena allocator, and profunctor feasibility checks for compile-time guarantees

Visual Lean ***Proof Visualization Engine***

- Developed graph-based visualization engine interfacing with Lean/Coq proof assistants; C++ with HPX parallelism, modern SWE practices (Makefiles, unit testing, CI)

Reverse Engineering

- Completed Malware Analysis & RE coursework (x86 asm, binary exploitation via pwn.college)
- Solved all 0x40 xorpd x86 asm puzzles ('little black book') and completed multiple virus walkthroughs

SKILLS & INTERESTS

Skills: C, C++, CUDA, Python, Java, SQL, Git, Linux, CMake, statistical learning, optimization, data pipelines, reverse engineering (Ghidra, IDA Pro)

Interests: low-level systems, optimization, embedded ML, quantitative research, reverse engineering