Alexis Harvey

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EDUCATION

Louisiana State University (LSU), Baton Rouge, LA **August 2026 – Present**

Doctor of Philosophy, Computer Science; Master of Science, Computer Science (concurrent)

Advisor: Dr. Felipe Fronchetti, in collaboration with LSU Health

Research interests: applied artificial intelligence, LLM behavior and evaluation, computational social science, extended reality, and how language models can support decision-making and accessibility

Louisiana State University (LSU), Baton Rouge, LA – Roger Hadfield Ogden Honors College **August 2022 – May 2026**

Bachelor of Science, Computer Science – Data Science and Analytics, with College Honors

Minor: Mathematics

Related Coursework: Calculus 1-3, Differential Equations and Linear Algebra, Discrete Mathematics, Numerical Methods, Physics, Probability, Advanced Data Structures, Computer Organization and Design with C, Optimization, Machine Learning and Data Analytics, Database Systems, Data Science and Analytics, Programming Languages, Operating Systems, Big Data, Applied Deep Learning, Software Testing

HONORS AND AWARDS

LSU Board of Supervisors Scholarship, Louisiana State University — Current

LSU Alumni Scholarship, Louisiana State University — 2022 – 2026

College Honors, Roger Hadfield Ogden Honors College — May 2026

RESEARCH EXPERIENCE

Systematic Mapping Study on the Joint Use of AI and XR in Medical Procedural Training **June 2026 – Present**

LSU A&M and LSU Health

- Co-authoring a PRISMA-aligned mapping study of AI and extended reality in procedural medical training, built around four research questions: clinical domains covered, AI software and XR hardware used, how systems are evaluated and clinically validated, and how much human intervention remains in the loop
- Ran searches across IEEE Xplore, ACM DL, ScienceDirect, SpringerNature, PubMed, and Embase and screened results against a written inclusion/exclusion protocol; screening uses two human reviewers plus a local LLM pass to flag inconsistent decisions
- Designed the coding scheme used to classify included papers by XR technology, AI technique, evaluation type, and level of AI autonomy, with controlled vocabularies so codes stay comparable across reviewers

VR Training Metrics User Study **August 2026 – Present**

RISE Lab, LSU A&M

- Designing a follow-on experimental study comparing undergraduate and medical students on the first two chapters of a VR procedural training system, capturing session transcripts, in-task performance measures, and a post-session usability questionnaire

Security Analysis of Robotic and Cyber-Physical Systems Literature **August 2026**

RISE Lab, LSU A&M

- Coded a corpus of CPS and robotics security papers (e.g. DriveFuzz, CCS 2022) using a STRIDE/DREAD framework under strict citation-only evidence rules, producing per-paper threat charts with impacted assets and entry points; codes were compared against other coders for inter-rater consistency

PUBLICATIONS AND PRESENTATIONS

- *Systematic Mapping Study on the Joint Use of AI and XR in Medical Procedural Training.* Manuscript in preparation.
- *The Agora: A Platform for Democratizing Civic Intelligence Through Legal Research, Media Bias Analysis, and Electoral and Legislative Transparency.* Senior design capstone defense on system architecture and evaluation, LSU.
- *Contract Wizard: AI-Powered Legal Document Platform.* Presented to an audience of about 200 in collaboration with Performance Contractors, Baton Rouge, LA; the project received media coverage.

EXPERIENCE

Student Software Developer **September 2025 – January 2026**

LSU Center for Analytics and Research in Transportation Safety (CARTS), Baton Rouge, LA

- Assisted in developing and testing full-stack applications using C#, JavaScript, SQL, and front-end frameworks, while managing large relational datasets and contributing to software support and enhancement for the center

Men's Basketball Manager **August 2022 – May 2024**

LSU Men's Basketball, Baton Rouge, LA

- Daily responsibilities included keeping team statistics, aiding head coaches, gathering footage, helping with recruitment, maintaining equipment, conditioning work with players, and facility maintenance

LEADERSHIP

Chapter President **November 2024 – December 2025**

Delta Zeta Sigma Chapter, Baton Rouge, LA

- Ran weekly Executive Council and chapter meetings and planned events for 400+ members; assisted in creating budgets and

contracts and communicated daily with Delta Zeta National, LSU Greek Life, and local alumnae to keep the chapter in line with expectations and procedures
- Wrote the chapter's presidential transition document and house rules handbook

PROJECTS

NowIL **January 2026 – Present**

Independent Project, Baton Rouge, LA

- Building an end-to-end NIL valuation pipeline for collegiate athletes: scraping On3, ESPN, and Sports Reference data with Playwright, engineering a time-series feature store in PostgreSQL, and benchmarking an XGBoost lag-feature baseline against a PyTorch LSTM for game-by-game valuation forecasting, served via FastAPI

The Agora: A Platform for Democratizing Civic Intelligence Through Legal Research, Media Bias Analysis, and Electoral and Legislative Transparency **January 2025 – Present**

Senior Design Capstone, LSU A&M

- Designed and implemented a full-stack political data dashboard using React, Vite, TypeScript, and Firebase (Google Auth) with a Python FastAPI backend, integrating real-time APIs (DDHQ, AP, OpenStates, ProPublica, CourtListener, CAP, etc.) for elections, finance, law, and civics data
- Built a retrieval-augmented generation (RAG) pipeline with Postgres + pgvector for legal/civic case search, developed modular backend routers, and deployed infrastructure on Firebase Hosting and Google Cloud Build with optional Cloud Run
- Added interactive D3 Geo/TopoJSON election maps

VLM Context Sensitivity in Mammogram Reading **October 2026 – Present**

Independent Research Project

- Testing whether open vision-language models (Qwen3-VL-8B, MedGemma 1.5 4B, InternVL3.5-8B) change their CBIS-DDSM mammogram readings when only the prompt context changes (patient details, a colleague's stated opinion, irrelevant text) while the image is held fixed
- Froze data splits and a pre-specified analysis plan (hashed and tied to a git tag) before test-set runs; paired within-case design with Holm correction across 12 primary hypotheses, token-level malignancy probability as the confidence measure, and statistical analysis in R with a Python cross-check

Tetris Machine Learning Arena **August 2026 – Present**

Graduate Course Project (CSC 7333: Machine Learning), LSU A&M

- Built a Python Tetris platform where a human plays side by side against up to three of 5–8 ML/DL agents (including DQN, PPO, behavior cloning, and local LLM agents), starting as a Pygame desktop app and moving to a web UI with selectable interface themes
- Evaluated all agents under a shared protocol; the main leaderboard resulted in an 8-way statistical tie, and the analysis documented DQN value overestimation and a silent Apple MPS gradient bug that initially broke PPO training

Counterplay: Basketball Strategy and Opponent Scouting App **October 2026 – Present**

Independent Project

- Built a Next.js/TypeScript app where coaches draw or upload a play and get the top 3 counters from a 165-entry library, each with a 0–100 matchup score and reasons from a rules-based scoring engine; 87 sets run on an animated court
- Added an opponent optimizer for 728 NCAA D-I teams that estimates each team's scheme mix from daily-synced season stats; PostgreSQL with Drizzle ORM, passwordless sign-in, installable PWA, and 1,064 Vitest unit tests plus Playwright end-to-end tests

SKILLS

Programming: Python, C, C++, C#, Java, TypeScript, JavaScript, SQL, Scheme, HTML, CSS, LaTeX

Languages: Fluent in English, Proficient in Spanish

Frameworks: PyTorch, FastAPI, React.js, Vite, .NET, Django, Spark/PySpark, Hadoop/HDFS, Delta Lake, scikit-learn, XGBoost, Pandas, NumPy, MediaPipe

AI/ML: Transformers, LSTMs, RAG pipelines, Vector Embeddings, LLM Fine-Tuning and Evaluation, Deep Learning, NLP, local LLM deployment

Data and Infrastructure: PostgreSQL, SQLite, Firebase/Firestore, ChromaDB, Pgvector, Elasticsearch, Google Cloud, Docker, Git, GitHub Pages

Research Methods: Systematic mapping studies, PRISMA screening, qualitative coding and inter-rater reliability, usability evaluation, user study design

Other: Team Collaboration, Public Speaking, Video Editing and Development