Thomas Mitchell

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EDUCATION

University of Notre Dame   Notre Dame, IN
BS in Computer Science and Statistics, GPA: 3.82/4.0   08/2023 – 05/2027
Coursework: Fundamentals of Computing (C), Data Structures, Computer Systems, Modern Web Development

Glynn Academy   Brunswick, GA
High School Diploma, Class Rank: 4/417   08/2019 – 05/2023

WORK EXPERIENCE

PatientPal, Inc., *Co-Founder and CTO*   06/2025 – Present
- Launched PatientPal, a HIPAA-compliant iOS patient-centered health advocate, currently in public beta on TestFlight with double-digit active testers.
- Incorporated Infermedica's diagnosis API by creating custom SwiftUI components to persist end-to-end patient interactions.
- Integrated Apple's Foundation Model to auto-generate SOAP summaries of medical consultations using Apple's @Generable macros for structured responses.
- Orchestrated Foundation Model tooling to aggregate user data and dynamically construct prompts, powering an on-device chatbot that addresses the $\approx 80\%$ of medical instructions patients forget post-consultation.
- Deployed patientpalinc.com with Vite, TypeScript, and AWS Amplify, and prototyped a Node.js + DynamoDB backend with JSON Web Tokens and ERC-721 token gating for secure future off-device transcript storage.
- **Technologies Used:** AWS Amplify, DynamoDB, React, TypeScript, Node.js, Solidity, Swift, Apple Foundation Models

RESEARCH EXPERIENCE

Notre Dame DM2, *Research Assistant for Dr. Jiang*   02/2025 – 08/2025
- Tuned Profile-Aware Decoding (PAD) on Hugging Face LLMs, adjusting temperature and subtraction parameter α for logit subtraction, and conducted extensive prompt engineering across text generation and classification tasks.
- Applied retrieval-augmented generation (RAG) to filter and rank user data for inclusion in prompts, enabling context-aware personalization at scale.
- Achieved 6–8% ROUGE and 5–9% classification accuracy gains over baselines through large-scale evaluations on LAMP and PRISM benchmarks, while analyzing trade-offs in multi-choice classification tasks.
- Co-author on forthcoming paper (2025) presenting PAD for personalized LLM outputs.
- **Technologies Used:** Python, PyTorch, Hugging Face Transformers, Conda, Linux (GPU configuration), Shell scripting

Notre Dame Blockchain Research Group, *Blockchain Researcher*   08/2024 – 05/2025
- Mined 21,000+ binary Polymarket events, isolating 1,100 in Pandas DataFrames to study market behavior and structure.
- Leveraged Pandas/NumPy operations and Seaborn graphs to evaluate and visualize bet size distributions, entry timing, whale influence, and sell-off dynamics.
- Formulated probabilistic models (beta distributions, bootstrapping, Herfindahl–Hirschman Index) to detect market monopolization and accuracy trends.
- Developed a PyTorch predictor trained on 75% of individual market data, achieving 85.5% accuracy and revealing vulnerabilities in generalized predictive trading strategies.
- **Technologies Used:** Python, PyTorch, Pandas, NumPy, Seaborn

PROJECTS

Mini Jeopardy Quiz Platform, *Co-Engineer*   06/2025 – 07/2025
- Engineered a MERN-stack AI-powered Jeopardy platform enabling users to rapidly build and share their Jeopardy concepts.
- Adopted a centralized state management (useContext/useReducer) for question handling, live scoring, and backend calls.
- Devised a secure Node.js/Express backend with MongoDB Atlas storage, modular routes, middleware with JSON Web Token authentication, and simplistic error handling to protect game-creation and score-submission endpoints.
- Implemented the OpenAI GPT-o4-mini-high API to auto-generate quizzes, reducing setup time from 15 minutes to 1 minute per quiz in testing.
- **Technologies Used:** MongoDB, Node.js, Express.js, JSON Web Tokens, React, OpenAI API

TECHNICAL SKILLS

Programming Languages: TypeScript, JavaScript, Python, Swift, Solidity, C, HTML/CSS
Tools: Linux (shell, GPU configuration, WSL), AWS (Amplify, EC2, DynamoDB), MongoDB, GitHub, JSON Web Tokens
Frameworks/Libraries: React, Node.js, Express.js, Pandas, NumPy, PyTorch, Apple Foundation Models

LEADERSHIP

Head Delegate, Notre Dame Model United Nations Team: Led delegation to Harvard national conference