

Tobasum Mandal

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EDUCATION

VANDERBILT UNIVERSITY

M.S. Computer Science

Accelerated BS/MS 3+1 Program

Nashville, Tennessee

August 2026 – May 2028

VANDERBILT UNIVERSITY

B.S. Computer Science, Economics, Applied Mathematics

Nashville, Tennessee

August 2024 – May 2027

- UWC Davis Scholarship, Lumiere Family Scholarship Recipient, **Engineering GPA: 3.84** (Dean's List)
- **Student Organizations:** Vanderbilt Commodore Orchestra, UNICEF, Google Developers Group, CTF Club
- **Relevant Coursework:** Operating Systems, Computer Architecture, Integrated Software Design, Data Structures, Computational Neuroscience, Programming Languages, Cryptography, Linear Algebra, Probability & Stats, Econometrics

WORK EXPERIENCE

G2C Ventures

Palo Alto, California

Venture Capital Intern

May 2026 - Present

- Conducting technical due diligence on early-stage founders, evaluating product feasibility and engineering teams.

IBM watsonx AI Labs

Remote

Venture Fellow

February 2026 – April 2026

- Developed a self-directed growth agent for a live P2P API credit marketplace, contributing to a 3x increase in marketplace listings within the first month.

Vanderbilt Center for Transportation and Operational Resiliency

Nashville, Tennessee

Software Engineering Intern

January 2026 – April 2026

- Developed an agent-based simulation framework using SimPy and R-tree indexing to model 10,000+ traffic agents, optimizing congestion mitigation strategies across Nashville's corridors. Applied reinforcement learning for dynamic incentive allocation, improving reward distribution efficiency by 15% through greedy and metaheuristics.
- Calibrated behavioral models from 369,831 rideshare trips, increasing prediction accuracy by 32% for carpool adoption and departure time shifts.

Advanced Learning Lab (ALL), Vanderbilt University

Nashville, Tennessee

Machine Learning Intern

August 2025 - Present

- Developed multimodal ML pipelines using Random Forest, XGBoost, and neural architectures to predict student metacognition, motivation, and math learning on Carnegie Learning's MATHia platform with 88% accuracy.
- Engineered and evaluated 50+ multimodal features across linguistic, engagement, and time-series domains using NLP and advanced imputation methods, improving predictive stability by 12% and interpretability for learning analytics.

iTELL AI

Nashville, Tennessee

Natural Language Processing Intern

January 2025 - Present

- Conducted Domain-Adaptive Pre-Training (DAPT) on ModernBERT, BLEURT, and MPNet, achieving 83% accuracy in open-ended comprehension scoring and improving inference latency by 22%.
- Built end-to-end LLM-based automation pipelines for PDF-to-JSON conversion and dynamic scoring, leveraging PyTorch, Hugging Face, CUDA, OpenAI API to accelerate processing by 60%, and MLflow for lifecycle tracking.

Category Lab (CATLAB), Vanderbilt University

Nashville, Tennessee

Machine Learning Research Intern

June 2025 - July 2025

- Developed and optimized DNN/CNN and CLIP-based vision-language models to study visual cognition and perceptual expertise, achieving 96% accuracy on ECOSSET and ImageNet benchmarks. Engineered GPU-accelerated deep learning workflows.

PROJECTS & WORKING PAPERS

Edge-AI Earthquake Search and Rescue System (AWS Autonomy Hackathon Winner, Fall 2025) - [GitHub](#)

Researcher-in-the-Loop AI Agent for Quantum-Classical Code Optimization - [GitHub](#)

Fractal Pre-Training for Neural Networks: Exploiting Self-Similar Structure for Improved Generalization - [GitHub](#)

Mode-Dependent Linguistic Variation in LLM-Generated Textbooks: A Corpus-Based Comparative Analysis

SKILLS

Programming Languages/Frameworks: Python, Java, TypeScript, C++, SQL, Arduino, PyTorch, TensorFlow, CUDA, ORB-SLAM

Cloud/Deployment Tools: Docker, Kubernetes, GCP, AWS (Lambda, S3, EC2), MongoDB, Databricks, MCP, RESTful APIs, W&B