Fardeen Bablu

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EDUCATION

Vanderbilt University — Nashville, TN **May 2026**
Bachelor of Science in Computer Science, Mathematics, Public Health
Courses: Data Structures & Algorithms, Software Engineering, Operating Systems, Deep Learning, Linear Algebra
Activities: Head Resident Advisor, Entrepreneurship Society, First Generation VU, Assoc. of Bengali Students

SKILLS

Programming: Python, JavaScript/TypeScript, C/C++, R, SQL
Libraries: PyTorch, TensorFlow, NumPy, Scikit-learn, OpenCV, Matplotlib, React, Node.js, Tailwind CSS
Tools: Git, Docker, Kubernetes, CMake, AWS (S3, CloudFront), GCP (BigQuery ML, Cloud Run), Figma

EXPERIENCE

Machine Learning Intern **Nashville, TN**
Vanderbilt University, Department of Computer Science May 2025 – Present
- Developed independent research tool analyzing 168+ tissue images with over 94% cross-species similarity.
- Built multi-modal framework with 4 approaches and custom loss functions for transfer learning.
- Engineered automated segmentation pipeline with quality visualizations and evaluation metrics.

Teaching Assistant **Nashville, TN**
Vanderbilt University, Department of Computer Science Jan. 2025 – Present
- Led 12 hours/week of office hours for 50+ students, focusing on debugging, OOP, & algorithm design.
- Graded 10+ coding assignments per cycle via GitHub & Autograder; improved student resubmissions by 30%.
- Supported 8 Software Engineering course teams; advised on design patterns, testing, and full-stack development.

Software Engineering Intern **Washington, DC**
Jenner & Block LLP June 2024 – Aug. 2024
- Automated Microsoft Outlook migrations for 50+ attorneys, reducing manual setup time by 40%.
- Configured Cisco Meraki Access Points across office; improved wireless stability & cut IT tickets by 25%.
- Collaborated with cross-functional teams to integrate 5+ enterprise applications, streamlining operations.

PROJECTS

AI Pong - DQN vs PPO Agents - Python, PyTorch, C++, SDL2, CMake – GitHub March 2025
- Custom C++ Pong engine with SDL2, supporting human play & AI agents with real-time gameplay.
- Added Deep Q-Network (DQN) & Proximal Policy Optimization (PPO) agents in PyTorch.
- Visualized agent performance with live plots and checkpoints across 2000+ episodes.

Spevents.live - Real-time Photo Wall - React, Three.js, Tailwind CSS, AWS S3 – Live Jan. 2025
- Built a QR-based, serverless Photo Wall with less than 500ms sync via AWS S3 + CloudFront for low-latency delivery
- Reduced bundle size by 60% through code-splitting & visual effects with Framer Motion & Three.js
- Successfully demoed across 4 large Vanderbilt cultural events, with guests contributing 200+ candid photos

Healthcare Networks - Analysis in the U.S. - Python, NetworkX, Pandas – GitHub Nov. 2024
- Processed 100K+ provider records across 50 states & built network visualizations of care accessibility patterns.
- Created 3 interactive graphs highlighting regional disparities in healthcare provider distribution from 2011–2013.
- Wrote 15-page research paper analyzing state-level network patterns in healthcare spending and access.

QuizLITE - Flashcard Desktop App - C++, SQLite, Qt6, CMake – GitHub Aug. 2024
- Open-source flashcards app with 3 learning modes as a free, offline Quizlet alternative used by classmates.
- Engineered SQLite backend for handling thousands of flashcard sets with sub-100ms query response times.
- Built cross-platform desktop UI using Qt6, achieving 2x faster performance than similar web-based tools.

AWARDS

Amazon Mission Autonomy Hackathon 2025 – 2nd Place ($15K Prize) – Pitch | Github Nashville, TN
HUSH-MESH, an AWS-powered autonomous maritime defense network with RF-silent drones for routing.

Google Solutions Challenge 2025 - Top 3 Finalist - Pitch | Github Google NYC Campus
Gemicast, a real-time outage-risk dashboard + predictive alerts, inspired by recent Tennessee floods.

Accenture Innovation Challenge 2024 - Top 5 Finalist - Pitch Washington, DC
NPForward, an AR/VR "Pokémon Go" style park collectibles + rewards to boost Gen-Z engagement.