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, Operating Systems, Deep Learning, Linear Algebra
Activities: Head Resident Advisor, Entrepreneurship Society, First Generation VU, Association of Bengali Students

SKILLS

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

EXPERIENCE

Undergraduate Research Assistant Nashville, TN
Vanderbilt University, Department of Computer Science *May 2025 – Present*
- Enhancing Glo-In-One-v2 segmentation of 368+ kidney images & 23,529 glomeruli using dynamic-head residual U-Net models.
- Implemented rodent-to-human transfer learning, improving segmentation accuracy by +11% over baseline.
- Containerized full ML pipeline with Docker for reproducible deployment; reduced setup time by >70%.

Undergraduate Teaching Assistant Nashville, TN
Vanderbilt University, Department of Computer Science *Jan. 2025 – April 2025*
- Led 8 hours/week of office hours for 25+ students in CS 1101 (Java), focusing on debugging, OOP, & algorithm design.
- Graded 10+ coding assignments per cycle via GitHub & Autograder; improved student resubmissions by 30%.
- Incoming Fall 2025 TA for CS 4278 (Software Engineering), teaching design patterns, testing, & full-stack development.

Information Technology 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 internal operations.

PROJECTS

Gemicast — Outage Forecasting Platform | *Angular, TypeScript, TensorFlow, BigQuery, Firebase – GitHub* *May 2025*
- Led full-stack development of an AI-powered platform predicting localized power outages across Tennessee counties.
- Built TensorFlow Decision Forests model trained on NOAA weather API + Eagle-I outage data (2014–2023).
- Designed dashboard UI with map visualization, risk scores, & Gemini AI chatbot with Google Calendar integrations.

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

Spevents.live — Real-time Photo Wall | *TypeScript, React, Three.js, Tailwind CSS, AWS S3 – GitHub* *Jan. 2025*
- Built a QR-based, serverless Photo Wall with <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*
- Created an 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

Google Solutions Challenge 2025 Google NYC Campus
Top 3 Regional Finalist *June 2025*
- Developed Gemicast, an AI-powered outage prediction platform to enhance community preparedness.
- Concept: Real-time risk dashboard + predictive alerts for localized outages, inspired by severe Tennessee storms.
- Presentation | GitHub

Accenture Innovation Challenge 2024 Washington, DC
Top 5 National Finalist *March 2024*
- Designed NPForward, an AR/VR-based gamification platform for National Parks to increase Gen Z engagement.
- Concept: Pokémon Go-style collectible experience tied to physical park visits & wildlife, integrated with a rewards system.
- Presentation | Figma Prototype