Bilal Tariq

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EDUCATION

Amherst College | *Amherst, MA*   ***Expected May 2027***
Bachelors of Arts in Computer Science & Mathematics (Double Major)
- **GPA**: 3.90 / 4.0; **Major GPA:** 3.91 / 4.0
- **Relevant Coursework:** AI, Operating Systems, Machine Learning, Data Structures, Algorithms, Linear Algebra, Calculus (I - III)
- **Fellowships:** MeikleJohn Fellowship ($5,000 research and development grant for startup), AI in the Liberal Arts Fellowship

EXPERIENCE

Google exploreCSR AI Researcher | *Google Research*   *Providence, RI*
PyTorch Geometric, CUDA/C++, Git, Bash   ***January 2025 - April 2025***
- Revamped a **neural rendering pipeline** converting **CAD models to sketches** by proposing and leading the implementation of **Graph Attention Networks** in a research group of 5
- Researched and designed **custom multi-head attention mechanisms** for the research pipeline. Optimized data preprocessing and **accelerated training** convergence by **17%**; **improved accuracy** from **87% to 93%**
- **Won 1st place** at the **Brown & Google** Undergraduate CS **Research Symposium** out of 40 researchers - awarded $1,000

Gregory S. Call Software Engineering Intern | *Amherst College*   *Amherst, MA (Remote)*
Python, TensorFlow, Keras, Docker, GitHub CI/CD, Bash   ***May 2025- July 2025***
- Engineered an **end-to-end TensorFlow UNet++** segmentation pipeline that spots crevasses in Sentinel-1 radar images, **raising accuracy 92.8% to 99.1%** compared to pre-established pipelines
- **Containerized the full workflow** (pre-processing, training, evaluation) for reproducible deployment on an **A100 GPU cluster** allowing easy access to fellow researchers

Software Engineering AI/ML Intern (Computer Vision) | *Brown University*   *Providence, RI*
Python, PyTorch, PointNet++, Git, Docker   ***June 2025 - August 2025***
- Designed and implemented a **point-cloud diffusion model** that turns raw CAD edge graphs into hand-draw stroke renderings. Implemented unpaired shape translation running **4x faster than baseline Graph-CNN's**
- Spearheaded the project: set weekly milestones, conducted literature reviews, automated ablation studies and **maintained reproducible Docker environments** for the lab team
- Currently **co-authoring a paper for ISVC 2025** and preparing an MIT-licensed open-source release to support sketch-based design tools

Co-Founder & CTO | Layout (early-stage startup)   *Amherst, MA*
Typescript, React, Babylon.js, TailwindCSS, AWS Lambda, PostgreSQL   ***October 2024 - Present***
- Architected and **shipped a full-stack web platform** that lets **buyers furnish and explore apartments in live 3-D;** established front-end UI/UX experience with **React and Babylon**; built an **automated AWS-Lambda pipeline** to ingest GLB/OBJ furniture models and CAD floor-pans
- **Recruited** and mentored a **4-engineer team**; established GitHub Actions CI/CD, code-review standards and three-week sprints; **delivered MVP in 7 months**
- Developed sales pitch and investor demo, pitched to 3 investors in preparations for seed-round funding. Established partnerships with real-estate firms and furniture suppliers

PROJECTS

Bare-Metal Operating System (BIOS, Kernel + Journaling File System) | *RISC-V , C / C++*   ***March 2025***
- Bootloader jumps to **supervisor mode in <150ms**; kernel with paging & interrupt/exception handling that withstands **30+ tasks stress test**
- **NoonFS:** crash-safe, journaling file system with directory/permission support and **block-cached I/O**; mounts **multi-terabyte images** and recovers cleanly after power loss

Java NN - Core | Java, JUnit, Maven   ***October 2024***
- Pure Java neural-network & linear algebra library; custom BLAS-style engine trains MNIST to 98% accuracy on CPU; released as a Maven package with full Javadoc

SKILLS

Languages & Frameworks: Python, Java, C / C++, Javascript, Typescript, React.js, PostgreSQL, RISC-V Assembly, HTML/CSS
Machine Learning Stack: Pandas, PyTorch, TensorFlow, Keras, Google CoLab, Weights & Biases
Tools: Git, Docker, Firebase, Flask, Figma, Unity, Blender, Adobe Creative Cloud Suit, LaTeX
Interests: Digital Art, Filmmaking, Poetry, Piano, Cricket, Tennis