

Arnab Dev

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EDUCATION

The University of Texas at Dallas, Richardson, TX
Bachelor of Science, Computer Science

August 2024 – May 2027
GPA: 3.9

- Student of the Hobson Wildenthal Honors College, Dean's List, Full-Tuition AES scholarship recipient.
- Relevant Coursework: Data Structures and Algorithmic Analysis, Computer Architecture, UNIX Programming.

PUBLICATIONS

"Variability-Aware Fuzzing" Meah Tahmeed Ahmed, **Arnab Dev**, Shiyi Wei, ICSE 2026.

WORK EXPERIENCE

Research Assistant

October 2024 – Present

University of Texas at Dallas (Richardson, Texas)

- Engineered VAFuzz, a **high-performance fuzzer (4000 executions/second)** extended from AFL++. Implementing C/C++ configuration and input co-execution algorithm for presence-condition seed queues and variability-aware mutations. Achieved **superior code coverage on 84% of benchmark programs**.
- Extending the Google FuzzBench framework to support compile-time configurability, utilizing Docker containers to orchestrate scalable variability-aware fuzzing experiments.
- Developed complex Bash and Python automation scripts to manage the build, execution, and data extraction of large-scale fuzzing campaigns Working on dynamic analysis and fuzzing at Dr. Shiyi Wei's lab.

Software Developer Intern

June 2024 – August 2024

Bondstein Technologies Limited (Dhaka, Bangladesh)

- Developed scalable, responsive web interfaces using Next.js and Tailwind CSS, integrating with Node.js backends to deliver seamless user experiences.
- Optimized rendering paths by implementing memoization strategies (React.memo, useMemo) and code-splitting, resulting in a **40% reduction in component re-renders and a 1.5s decrease in Time to Interactive (TTI)**.
- Refactored legacy API consumption patterns to use efficient data fetching hooks, **reducing redundant network requests by 25%** and improving application state stability.
- Automated deployment workflows via GitHub Actions CI/CD pipelines, **reducing build times by 30%**.

CS Teaching Assistant (Python)

October 2022 – December 2023

Edification Coaching Center (Dhaka, Bangladesh)

PROJECTS

Sprinklify | React, Spring Boot, Flask, Python, OpenCV, MongoDB

October 2025

- Built an ML-powered smart irrigation system that converts natural language and drone imagery into optimized sprinkler rotation and flow plans, **reducing water usage by 30–40% while maintaining 95%+ lawn coverage** accuracy through geometric modeling and learned control.
- Designed a full-stack, dual-backend architecture with real-time simulation and an interactive React dashboard, integrating optimization + PPO-based ML smoothing to generate adaptive watering plans.

HydraWatch | Flask, Next.js, Python, scikit-learn

November 2024

- An app to visualize gas pipeline data through an interactive dashboard for detection and prediction of hydrate formation using current gas injection metrics with a **95% accurate regression model** for real-time predictions.

TECHNICAL SKILLS

Languages: Python, C, C++, JavaScript, TypeScript, Java, SQL (MySQL, PostgreSQL), NoSQL (MongoDB), Bash

Frameworks: HTML, CSS (Tailwind, SCSS, Bootstrap), React, Next.js, Node.js, Flask, Spring Boot, Spring AI

Developer Tools: Azure, Git, Docker, Postman, Figma, Google Cloud Platform, Visual Studio, PyCharm, IntelliJ

Libraries: pandas, NumPy, Matplotlib, Vercel, scikit-learn

LEADERSHIP & INVOLVEMENT

Next Initiative Foundation, Founder, President

August 2020 – August 2024

- Recruited and **led 300+ volunteers, 4000+ participants**. Featured on national television twice.