

# Tru Bui

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## EDUCATION

### Purdue University - GPA: 3.81/4.00

*Bachelor of Science in Computer Science, Minor in Electrical and Computer Engineering*

West Lafayette, IN

May 2027

**Relevant Coursework:** Database Systems, Operating Systems, Systems Programming, Computer Architecture, Data Structures and Algorithms, Analysis of Algorithms, Object-Oriented Programming, Digital System Design

## PROJECTS

### Multithreaded HTTP Server ( C / C++ )

April 2025

- Developed an HTTP Server supporting Basic Auth, CGI-bin, directory browsing, and request logging/statistics.
- Implemented iterative, thread-per-request, and thread-pool modes, handling 1K+ concurrent connections.

### Custom Memory Allocator ( C )

March 2025

- Implemented a malloc, free, realloc and calloc replacement using segregated free lists, block splitting, and coalescing.
- Built as a shared library compatible with LD\_PRELOAD for use in unmodified programs.

### SimpleC Compiler ( C / Flex / Bison / x86-64 )

December 2024

- Developed a compiler for the SimpleC language targeting x86-64, generating assembly via a single-pass codegen backend.
- Implemented parsing with Flex/Bison and code generation for expressions, control flow, and function calls.

### Concurrent Shell ( C / C++ )

January 2025

- Built a POSIX-style shell in C/C++ supporting pipelines, redirection, job control, signal handling, subshells, wildcarding, and a raw-mode line editor.
- Implemented parser using Flex/Bison and process execution using fork(), execvp(), pipes, and waitpid().

## EXPERIENCE

### Tech4Research ( C# / MySql / Azure )

Remote

*Software Engineering Intern*

May 2024 – August 2025

- Delivered C# backend systems on Azure Function Apps, supporting two U.S. Department of Veterans Affairs research studies that reached over 800+ Veterans with PTSD.
- Developed demographic-balanced randomization workflows in MySQL for NYU's *Together Against Overdose* study with 800+ participants.
- Built scalable, modular email microservices for PIRI (Parent-Infant Research Institute) using Azure Blob Storage templating, reaching 275K+ users.
- Engineered a Stripe-integrated payment API supporting subscriptions, carts, and one-off transactions with secure WebHooks and logging.

### Purdue University ( C / x86-64 / ARM )

West Lafayette, IN

*Undergraduate Teaching Assistant (CS 250: Computer Architecture)*

August 2025 – Present

- Teach labs for 50+ students covering ARM/x86-64 assembly, memory hierarchies, caching, branch prediction, and program execution.
- Provide debugging guidance on pipeline hazards, cache behavior, address translation, and architecture-level performance.

### Purdue University ( Python / Pytorch )

West Lafayette, IN

*Research Assistant*

January 2025 – June 2025

- Conducted large-scale benchmarking of AI image generation models on Purdue's HPC cluster to evaluate throughput, latency, output quality, and reproducibility.
- Built automated PyTorch evaluation pipelines for batch execution, reproducible experimentation, and performance scoring across distributed compute nodes.

## SKILLS

**Programming Languages:** C, C++, Python, C#, SQL

**Technologies and Tools:** Linux, GCC/Clang, GDB, Valgrind, Make/CMake, Git

**Cloud & Automation:** Azure Functions, AWS Lambda, CI/CD (GitHub Actions, Vercel), Visual Studio

## Awards and Activities

**Purdue University Dean's List** (Fall 2023 – Spring 2025)

**Purdue University Semester Honors** (Fall 2023 – Spring 2025)

**Lincoln High School Valedictorian** (Class of 2023)

**Purdue Taekwondo Club**, 4th-Degree Black Belt, National Competitor & Instructor (4 yrs); certified Master by Kukkiwon