Newton Ni

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Education

The University of Texas at Austin - College of Natural Sciences · August 2022 — Current
- PhD student advised by Emmett Witchel
- Researching memory management for CXL shared memory

Cornell University - College of Engineering · May 2019
- B.S. in Computer Science — 3.93 GPA
- Selected Coursework — Compilers, Programming Languages, Functional Programming, Formal Verification, Algorithms, Computer Systems, Operating Systems, Distributed Systems

Experience

Software Engineer - Commure · August 2019 — March 2022
- Developed Rust procedural macro for strongly-typed metrics
- Implemented HL7v2 lexer with copy-on-write escape sequence support
- Augmented FHIR mapping language engine with CSV, JSON, XML support

Research Assistant - Nate Foster, Cornell Engineering · May 2018 — May 2019
- Designed type system for the P4 network programming language
- Translated informal P4–16 specification into OCaml code
- Discovered bugs in p4c compiler and wrote minimal test cases

Teaching Assistant - Functional Programming and Data Structures · Jan 2018 — May 2019
- Lead semiweekly lecture and exercise-based recitation of 30 students
- Created review exercises on concepts like monads, interpreters, and streams
- Received average rating of 4.7/5.0 across 19 metrics and 21 student evaluations

Teaching Assistant - Honors Object-Oriented Programming · Aug 2017 — Dec 2017
- Held office hours for 10–20 students, one and a half hours per week
- Taught lab with four other consultants for 25–35 students, one hour per week
- Wrote automated submission format checker

Projects

xic-rs - Xi Programming Language Compiler · Jun 2018 — Aug 2018
- Compiles object-oriented Xi language to x86-64 assembly using Rust
- Implements linear scan register allocation and dataflow optimizations (e.g. partial redundancy elimination)
- Establishes correctness through snapshot testing and behavior equivalence

paxos - Paxos Distributed Consensus Protocol · Nov 2018 — Dec 2018
- Implements a generic replicated state machine library backed by Multi-Paxos
- Verifies correctness with a JSON DSL-based test harness and extensive logging
- Includes an example chatroom state machine with runnable server and client

Skills

- **Languages:** Rust, Java, OCaml, Python, Javascript, C
- **Software:** Git, LaTeX, Bash, Unix, Vim, tmux
- **Interests:** Violin, guitar, bouldering, volleyball, cooking, reading