Class of 2017
121 Olde Manor Lane
Pittsburgh, PA 15108
(412) 443-2034
U.S. Citizen
rfernau@
andrew.cmu.edu
mrm12lrv.github.io

Languages
C/C++
Python
Java
C#
JavaScript
HTML/CSS
SQL
SML
OCaml
SystemVerilog
x86-64
ARM
MIPS

Technical Skills
Computer Systems
Modular Design
Parallel Computing
Version Ctrl (git)
Debuggers (gdb)
Testing
Object Oriented &
Imperative &
Functional &
Logic Paradigms
Shell Scripting
Windows
Mac OS X
Linux

Personal Traits
Patient
Quick learner
Inquisitive
Creative
Leader
Speaker

Joey Fernau

Computer Scientist

Carnegie Mellon University

Objective To obtain a job to utilize my strong programming abilities, problem solving, and relevant experience in computer science.

Education

Carnegie Mellon University, Pittsburgh, PA
B.S. Computer Science, May 2017
Minor in Computer Engineering

Experience

Intern at Devware Technology: Summer 2016
- Used SQL Server (T-SQL) to create various objects and data overlap reports for a **database** company that manages trucking rates.
- Created dynamic reports using the **Telerik API** that query records to display in a PDF report, which are **used by clients** on the company website.
- Wrote an **email manager** to offload work from the database.

Intern at Advanced Chip Test Laboratory (Atari 7800 Project): Summer 2015
- Worked with the Atari 7800 to implement **3D graphics** on 1986 computer with 4KB RAM and 48KB ROM by using **projective geometry** techniques.
- Dealt with arithmetic larger than word size of one byte by **implementing libraries** in 7800basic and in-line 6502 **assembly**.
- Worked around bugs that were in the 7800basic compiler itself.

Teaching Assistant: Spring 2015 - Spring 2017
- Led recitations, held office hours, graded, monitored online discussion forum, facilitated students in lab, created **autograders** for programming assignments.
- CS-15110 (M15, F15, S16, F16, S17), CS-15112 (M15), ECE-18240 (S15)

Projects

Unix Operating System: Spring 2016
- Wrote a Unix inspired operating system in C and x86-64 assembly with a partner.
- Implemented multiple **system calls** such as fork, exec, wait, kill, getpid, sleep.
- Designed **virtual memory**, thread management (mutexes, condvars, rwlocks), exception handling, **thread scheduling**, context switching, user and kernel **privilege levels**.
- Wrote **device drivers** for the keyboard (reading input), console (text display, printing), and timer.

Compiler from C to x86-64: Fall 2015
- Created a subset-of-C to x86-64 assembly compiler in **OCaml**, a functional language, with a partner.
- Implemented types, conditionals, loops, operators, memory management, and functions.
- Performed **lexical/syntactic analysis** and type-checking on C source code to generate intermediate states and apply **optimizations** such as dead code elimination and constant folding.
- Added an **LLVM backend** in addition to the **x86-64 backend**.

Dynamic Program Analyzing Tool: Summer 2016
- Research project at CMU that used Intel's Pin (a **binary instrumentation** tool) and Google's Protocol Buffers in C, C++, and Python.
- Created tool that **dynamically analyzes** a program and its modified counterpart.
- Determined if modification made retained certain properties such as commutativity and **parallelism**.

Class Project using Raycasting: Fall 2013
- Implemented **raycasting** in Python to simulate a 3D world using 2D shapes.
- Finished product is a retro first person shooter game in 2.5 dimensions.

Coursework

- [15-719] Adv Cloud Computing*
- [15-745] Optimizing Compilers*
- [15-417] HOT Compilations*
- [15-440] Distributed Systems*
- [15-411] Compiler Design
- [15-410] Operating Systems
- [15-487] Computer Security
- [18-447] Computer Architecture
- [18-349] Embedded Systems
- [10-601] Machine Learning
- [08-672] Webapp Development
- [15-451] Algorithm Analysis
- [15-210] Parallel Algorithms
- [21-484] Graph Theory
- [36-217] Probability

Related Activities

School of Computer Science Day Student Planning Committee: Fall 2014 - present
Planned CMU's School of computer science day of celebration.

Events
Build18 (Spring 2014/2017), TartanHacks (Spring 2015), Putnam Math Contest (Fall 2014)