BENJAMIN POSNICK

bmposnick@outlook.com • 315-877-7131 •
Website: benjaminmposnick.github.io •
LinkedIn: linkedin.com/in/bmposnick

Software Engineering Experience

Microsoft | *Software Engineering Intern* May 2020 – Aug 2020
Azure Core Operating Systems & Intelligent Edge: Enterprise & Security Remote

- Developed an application in *C++* to scan disk drives on Windows 10 desktop systems, verifying the certificates and Windows Defender reputation of all binaries
- Designed algorithms to determine which binaries will not be allowed to execute under a new, heightened security model and which applications will be affected as a result
- Investigated feasibility of migrating Windows 10 desktops to a proactive security model

SRC Inc | *Software Engineering Intern* May 2019 – Aug 2019
Electronic Warfare: Infrastructure & Security Syracuse, NY

- Developed a lexer, parser, and interpreter for a query language using *ANTLR* & *Java* to enable a unified way of querying in Alfresco and SOLR for improved user experience
- Containerized backend services for a monolithic web app using *Docker & Ansible* and implemented a *Jenkins* continuous integration pipeline for deploying microservices
- Built a full-stack web app in *React.js* & *Node.js* to configure an electronic warfare system

Research Experience

Cornell University | *Distributed Systems Research Assistant* Mar 2020 – Dec 2020
Department of Computer Science: Ken Birman Research Group Ithaca, NY

- Analyzed the effects of SPDK-based persistent storage on latency and bandwidth as part of a library for building high-speed replicated systems on RDMA networks

Syracuse University | *Computational Biology Research Assistant* Jun 2018 – Oct 2019
Syracuse Biomaterials Institute: NSF REU Program Syracuse, NY

- Implemented real-time image segmentation and object tracking as part of a cell tracking software package in *MATLAB* to enable analysis of cell migratory behavior during imaging

Software Projects

A sharded, linearizable key-value storage system with dynamic load balancing

- Designed a distributed key-value storage system in *Java* capable of handling network partitions and redistributing shards across replica groups while maintaining linearizability
- Implemented multi-Paxos to ensure fault tolerance of replica groups, optimized with mechanisms for garbage collection and electing a distinguished proposer

ChipotLang. An interpreted functional programming language for concurrent programming

- Designed a functional programming language that uses continuations to model threads
- Built an interpreter, along with a lexer and parser, in *OCaml* that translates expressions into continuation-passing style and then evaluates them using the semantics of λ-calculus

OCamulator. A domain-specific language for linear algebra, probability, and statistics

- Developed an interpreted DSL in *OCaml* for mathematical computations, including row reduction, matrix factorizations, solving linear systems, and matrix-vector arithmetic

Teaching Experience

CS 4820: Analysis of Algorithms | *Teaching Assistant (TA)* Fall 2020
CS 2110: Data Structures & OO-Programming | *Head TA* / *TA* Spring 2020 / Fall 2019
CS 1110: Computing in Python | *Teaching Assistant (TA)* Spring 2019

Campus Involvement

Delta Tau Delta Fraternity | *Executive Board* Jan 2019 – Jul 2020
Cornell Interfraternity Council | *VP for Communications* Jan 2019 – Jan 2020

Education

Cornell University | College of Engineering
B.S. in Computer Science, May 2021
Cumulative GPA: **3.91** (*Magna cum laude*)
Focus Areas: *Systems & Machine Learning*
External Specialization: *Economics*

Skills

Programming Languages

Java • OCaml • C++ • C • Python • R • MATLAB • JavaScript • SQL • Bash

Systems

Linux • Microsoft Azure • RISC-V assembly

Machine Learning & Data Science

PyTorch • Keras • NumPy • scikit-learn • Stata

Web Development & DevOps

React.js • Node.js • Docker • Ansible

Coursework

Computer Science

Distributed Computing
Cloud Computing & Smart IoT Systems
Operating Systems
Supervised & Unsupervised Machine Learning
Programming Languages & Logics
Data Science
Artificial Intelligence
Analysis of Algorithms
Functional Programming
Computer Organization & Systems Programming
Data Structures & Object-Oriented Programming
Discrete Structures

Mathematics

Probability Theory
Engineering Probability & Statistics
Linear Algebra
Multivariable Calculus
Differential Equations

Economics

Applied Econometrics
Intermediate Microeconomic Theory
Environmental Economics

Publications

S.L. Buffington, **B.M. Posnick,** J. Paul, and P.T. Mather, "Ternary Polymeric Composites Exhibiting Bulk and Surface Quadruple-Shape Memory Properties," ChemPhysChem in press (2018).