Paul L. Biberstein

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Education

Brown University – *Providence, RI* *Expected Graduation: May 2023*

- Concentration: Computer Science & Mathematics
- Relevant Coursework: Real Time Computer Graphics, Computer Systems, Programming Languages, Compilers, Computer Vision, Logic for Systems, Networks, Electric Circuits & Signals, Graph Theory, Abstract Algebra, Computers & Music, Seminar in Electronic Music: Real-Time Systems, Theory and Teaching of Problem Solving

Programming Languages

- Rust, C++/C, Python, Javascript/Typescript, OCaml, Racket, Bash, MATLAB, Java, Lua

Software Engineering Experience

Software Engineering Intern – *Jump Trading, Jump Crypto* *Chicago, IL – Summer 2022*

- Wrote low-latency, modern C++ code to interact with financial exchanges
- Developed end-to-end testing framework to find regressions in key exchange-interface servers

Visual Computing Researcher – *Brown U. Visual Computing Lab* *Providence, RI – Spring 2022*

- Worked on novel methods for few-shot 3D mesh synthesis via transformer neural-networks
- Explored state-of-the-art methods for neural networks that learn implicit representations of 3D shapes
- Developed networks that learn quantized representations of 3D shapes

Programming Languages Researcher – *Brown U. Programming Languages Team* *Providence, RI – Summer 2021*

- Developed and tested a webapp to help bring introductory data science to the middle and high school level
- Designed platform for "what-if" data analysis and immutable data transformations that is accessible to students
- Prototyped and iterated design in team of 3 while following educator feedback

Software Engineering Intern – *MedRhythms* *Portland, ME – Summer 2020*

- Worked on agile team of 4 for a digital therapeutics company that uses sensors, music & software to build evidence-based, neurologic interventions to measure & improve walking for post-stroke recovery
- Created internal webapp for music metadata retrieval to speed up human-validated metadata retrieval by 5x

Sample Personal Projects – *github.com/P-bibs*

Skiff – gradually-typed, functional programming language *Summer 2021*

- Designed and implemented an interpreter and web editor in Rust for a functional programming language featuring pattern matching, type inference, algebraic data types, and first-class functions, skiff.paulbiberstein.me

Volumetric Physically-Based Renderer– renderer implementing SOTA algorithms *Spring 2022*

- Developed a renderer in Rust to generate physically accurate images of participating media such as fog and mist.
- Implemented photon-mapping algorithms from the initial 1998 paper to recent work using low-dimensional blurs

ML-ChordGen – chord-progressions powered by machine learning: *Winter 2019 – Spring 2019*

- Pre-processed data & trained a recurrent neural network to generate musical chords chordgen.paulbiberstein.me

Leadership & Communication Experience

Undergraduate Teaching Assistant – *Brown University Computer Science Department*

Design and Implementation of Programming Languages *Fall 2021 & 2022*

- As head TA, hire staff, run TA training, grade & write assignments, hold weekly office hours

Compilers and Program Analysis *Spring 2021*
Introduction to Computer Systems *Spring 2022*
Accelerated Introduction to Computer Science *Fall 2020*

Freelance Curriculum Designer – *Meridian Stories* (non-profit) *Summer 2019*

- Authored 3 multiweek curricular plans for local teachers to integrate STEM & 21st century media skills

Skills & Interests

Technologies: Linux, Shell Scripting, Docker, CI/CD, Git, TCP/IP, REST, CAD, WASM
Interests: Music (theory, performance, writing), Filmmaking, skiing, cross country running
Swiss & US Citizen