

# Maksim Smolin

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## Summary

UC Berkeley freshman looking for Software Engineering internship or Computer Science research opportunity for summer of 2020. Interested in positions with heavy emphasis on CS theory and/or math. Strong background in algorithms and data structures, and college-level mathematics. Familiar with web and mobile development, low level development, networking, and reverse engineering.

## Programming Languages

C++, Java, Python, JavaScript/Node.js, Haskell, Coq, Assembly, HTML, CSS

## Technologies

React.js, MariaDB, Koa.js, NASM, SDL2, Radare2, GDB, LLDB, Git, L<sup>A</sup>T<sub>E</sub>X

## Interests

Theoretical CS, Functional Programming, Formal Verification, Programming Language Design, Computer Graphics, Operating Systems

## Languages

English — Fluent

Russian — Mother tongue

Spanish — Basic knowledge

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## University of California, Berkeley · Berkeley, CA

*Anticipated 2023*; Intending Computer Science and Mathematics

- Data Structures
- Introduction to Abstract Algebra

*Summer of 2019*

- The Structure and Interpretation of Computer Programs (A+)
- Discrete Mathematics and Probability Theory (A)

## Harvard University Secondary School Program · Cambridge, MA

*Summer of 2018*

- Multivariable Calculus (A)
- Linear Algebra and Differential Equations (A)

## Coursera Courses · Online

*From 2018*

- Algorithms Part I
- Algorithms Part II
- Deep Learning Specialization

## Henry M. Gunn High School · Palo Alto, CA

*May 2019*

# Personal Projects

**ParserGen** · Parser creation toolkit · *Node.js*

<https://github.com/maximsmol/ParserGen>

Toolkit for creating LL1 parsers and RegEx tokenizers with verbose error reporting and from-scratch LL1 table generation, recursive descent RegEx string parsing, RegEx NFA generation and evaluation, token priority topological sorting, and splay-tree-based interval trees for verifying token non-intersection and coverage.

**nOS** · Operating system · *C++, Assembly, Haskell*

<https://github.com/maximsmol/nos>

32-bit x86 Operating system written from scratch with custom NASM bootloader, a complex Haskell Shake build system and C++ kernel and drivers. Currently able to boot and read ATA drives.

**Open GraphEq** · Graphing software · *C++*

<https://github.com/maximsmol/Open-GraphEq>

Implementation of an algorithm for generating robust graphs of mathematical functions presented in Jeff Turper's paper "Reliable Two-Dimensional Graphing Methods for Mathematical Formulae with Two Free Variables". Currently able to graph with domain-tracking and pixel-precision using custom interval arithmetic.

**Sourcepawn** · Open source compiler · *C++*

[https://github.com/maximsmol/sourcepawn/tree/exp\\_enum\\_struct](https://github.com/maximsmol/sourcepawn/tree/exp_enum_struct)

Extensive work on the experimental version of the open source Sourcepawn language compiler. Implemented new language features in a mature codebase. Modified the parsing, type system, compiler checks, and code generation.

**rolmodl** · Graphics library · *C++*

<https://github.com/maximsmol/rolmodl>

C++ API for the Simple Directmedia Library (SDL). Carefully designed C++ interface for the C-based SDL, focused on making memory safety trade-offs explicit and preserving performance of the original.

**prs** · Parsing techniques research · *Haskell*

<https://github.com/maximsmol/prs>

Research into parsing with nondeterministic finite automata to overcome the necessity to preserve the entire input stream upon branching imposed by traditional monadic parsers. Inspired by arrow parsers.

**resauce** · Remote console · *Haskell*

<https://github.com/maximsmol/resauce>

Binary remote console protocol implementation for the Source engine with a readline CLI.

**NoDialogs** · Text editor plugin · *Python*

<https://github.com/maximsmol/NoDialogs>

Sublime Text plugin that replaces sluggish system file dialogs with a blazingly fast versatile input box.

## Volunteer Experience

**Project QUERB** · Palo Alto, CA

*2017-Ongoing*; Website developer

Development and maintenance of the project QUERB website (<https://projectquerb.org/>) running on an Ubuntu, utilizing prerendering, React.js, Bootstrap, Webpack, Node.js, Koa.js, and Babel.

2nd place in AAPT 2019 Apparatus Competition.

**Get Involved Palo Alto** · Palo Alto, CA

*2017-2018*; Mobile application developer

Design and development of a community hour tracking iOS application using React Native.