

Sean Baxter

New York, NY

seanbax.circle@gmail.com

<https://www.circle-lang.org/>

<https://www.safecpp.org/>

PROJECTS

Circle/Safe C++ compiler — <https://www.circle-lang.org/>

Next-gen C++ compiler written from scratch. I quit my job and self-funded for eight years to develop this compiler. Its most important extension is [Safe C++](#). That adds a new middle-end IR (MIR) subsystem which enables *initialization and analysis* and *borrow checking* to deliver rigorous safety. It implements Rust's memory safety model into C++. The compiler can also be adapted for rich [C++/Rust interop](#).

Targets LLVM IR backend. Supports single-pass CUDA (NVPTX) code generation. 316,000 lines of C++.

Modern GPU — <https://github.com/moderngpu/moderngpu>

Textbook: <https://github.com/moderngpu/moderngpu/wiki/moderngpu-1.0>

Popular open source CUDA library and textbook. Extensive documentation of data-parallel algorithms and generic, high-performance implementations. Most extensive coverage of Merge Path-oriented algorithms for sorting, searching, graph and sparse matrix operations. Provides the implementation of many functions in NVIDIA's Thrust library (such as multiset operations, scan and merge sort). Currently 279 forks and 1700 stars on github.

EXPERIENCE

Jet Propulsion Laboratory/NASA, Pasadena, CA — *Software Engineer*

Jul 2008 - Dec 2011

Scientific computing and research in earth surface science and geophysics sections.

NVIDIA Research, Santa Clara, CA — *Research Scientist*

Feb 2012 - Apr 2014

Parallel algorithms development. Authored the Modern GPU library.

DE Shaw Research, New York — *Scientific Programmer*

Apr 2014 - Sep 2016

Developed GPU-accelerated molecular dynamics simulation and forcefield-fitting software.

C++ Alliance, New York — Scientist

Aug 2024 - Nov 2024

Authored the [Safe C++ ISO proposal](#) and created the Safe C++ project repository.

SKILLS

C/C++, Compilers, CUDA, LLVM, PTX, SPIR-V, Linux and Win32 programming.

PAPERS AND TALKS

- P3390 Safe C++ - <https://safecpp.org/draft.html>
- P3444 Memory Safety without Lifetimes - <https://safecpp.org/draft-lifetimes.html>
- Why Safety Profiles Failed - <https://www.circle-lang.org/draft-profiles.html>
- Building Bridges to C++ - <https://www.circle-lang.org/interop.html>
- CppNow 2022 Keynote - <https://www.youtube.com/watch?v=15j4bkipuAg>
- Press for Safe C++ - https://www.theregister.com/2024/09/16/safe_c_plusplus/

EDUCATION

Central Washington University, Ellensburg, WA

Physics, Bachelor of Science.

Math, Bachelor of Science.