annie.cherk@gmail.com **ANNIE CHERKAEV** *anniecherkaev.com*

EXPERIENCE

Galois, Software Research Engineer — *05/2019 - 08/2021*

DARPA CHESS program: I was on a team that built an LLVM-based program analysis platform, which allows users to write control & dataflow analyses to detect security vulnerabilities in C & C++ programs. *(Python)*

- Designed & implemented the subsystem responsible for automatically running analyses written in our custom query language every time a new codebase is ingested.

- Scaled the system to run in a micro-service architecture, including designing & implementing the server API and using Celery tasks.

- Designed & implemented the server API for further exploring analysis results in the UI.

- Designed & implemented the subsystem for running dynamic analyses. Wrote an LLVM pass that adds instrumentation to a binary to generate traces as it runs, and added plumbing to be able to use those traces in the subsystem that runs analyses.

- Wrote analyses to detect command injection & identify code responsible for authentication checks.

Google, Software Engineering Intern — *Summer 2018*

Developed a static analysis tool using LLVM to compute worst-case stack depth. Used this tool to compute the maximum stack depth of the vDSO (a userland interface to syscalls) and the Zircon kernel of the Fuchsia operating system. *(C++)*

Delcam, Software Engineering Intern — *Summer 2014*

Developed a wizard for designing custom gears and a macro for computing turn-curve tolerance. *(C++)*

MASTERS THESIS

SweetPea, a Programming Language for Experimental Design

Designed & implemented a domain specific programming language and runtime. The language allows scientists to declaratively describe the analysis they wish to perform, and the runtime synthesizes an experimental sequence with statistical guarantees that the sequence is unbiased. *(Haskell)*

Publication: SweetPea: A standard language for factorial experimental design.
https://doi.org/10.3758/s13428-021-01598-2

SKILLS

Programming Languages: Python, C++, Haskell, Racket, C, Go, Bash, Rust
Open Source Patches: Linux: CVE-2017-12762, GHC Bugfix #12117, ClangDoc Feature #D48395
Stacks: Docker, Postgres, FastAPI, LLVM
Interests: Scalability, Automation, Operating Systems, Compilers, Security, Programming Languages

EDUCATION

M.S. University of Utah
Computer Science, GPA: 4.0 / 4.0, December 2018

B.S. University of Utah
Major: Mathematics, Minor: Computer Science, GPA: 3.9 / 4.0 , May 2015