



**What?**

- This presentation is part of a 3-semester introduction to architecture, compilers, and operating systems using the selfie system.
- Selfie is a minimal, fully self-contained 64-bit implementation of a self-compiling C compiler, RISC-V emulator, and RISC-V hypervisor. Selfie can compile, execute, and virtualize itself any number of times!
- Everything needed is implemented in a single, 10-KLOC file of C code. There are no includes and no external libraries. For bootstrapping, a C compiler will do.
- The purpose of selfie is to teach the implementation of programming languages (C subset), operating systems (virtual memory, concurrent processes), and processor architecture (RISC-V subset), all using the same code!

# Why?

- Selfie shows, from first principles, how a minimal but still realistic hardware and software stack works.
- Anyone understanding elementary arithmetic and Boolean logic may be able to follow!
- The goal is to see and understand how the semantics of programming languages and the concurrent execution of programs is constructed using nothing but bits.
- The self-referential nature of the construction is an important part of selfie. Seeing how to resolve it establishes a well-founded understanding of basic computer science principles.

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