



Chipyard: Integrated Design, Simulation, and Implementation Framework for Custom SoCs

PIs: Krste Asanovic, Bora Nikolic, Sophia Shao



Overview

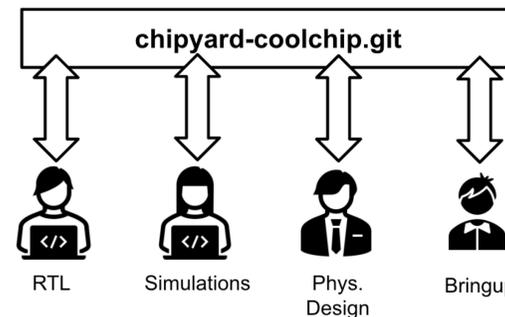
Chipyard is an open, extensible research and design platform for RISC-V SoCs:

- Unified framework of parameterized generators
- One-stop-shop for RISC-V SoC design exploration
- Supports variety of flows for multiple use cases
- Open-sourced, community and research-friendly



Chipyard for Tapeouts

- Chipyard is a single source-of-truth for a chip with:
 - RTL Development: develop new accelerators/devices and test rapidly
 - FireSim: evaluate your design on real workloads
 - Hammer: reusable/extensible VLSI flow
 - Bringup: generate FPGA bringup platforms



Chipyard Tutorials

- Tutorials at top conferences:
 - ISCA 2021/2022/2023
 - ASPLOS 2022/2023
 - HPCA 2023
 - MICRO 2021/2022
 - HotChips 2020
 - RISC-V Summit 2019



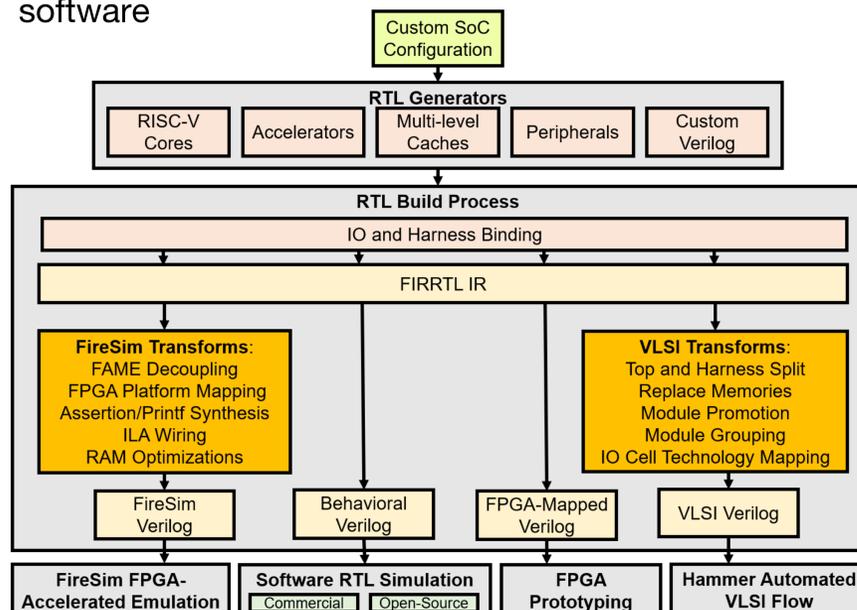
ASPLOS 2023 Tutorial

- Full/half day tutorial on
 - Chipyard basics
 - FireMarshal builds
 - FireSim Builds/Simulation
 - FireSim Debugging

- See slides/videos at:
 - fires.im/tutorial

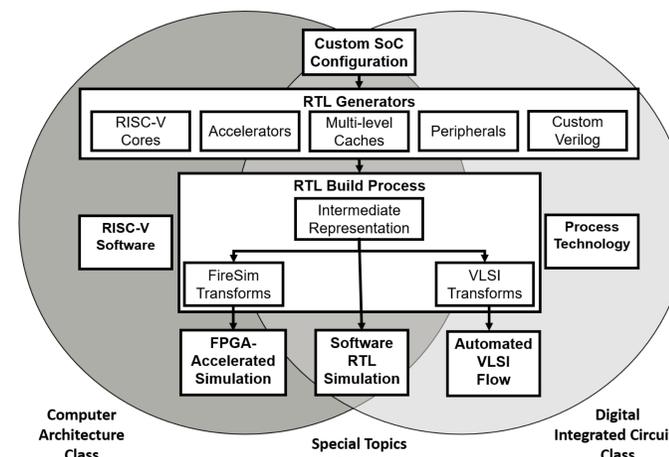
Chipyard Organization

- Configs: Describe parameterization of an SoC
- Generators: Reusable library of open-source RTL designs
- IO/HarnessBinders: Configure IO and Harness features
- Target flows: different flows for different users
- Software: Plug-n-play customizable baremetal/Linux software



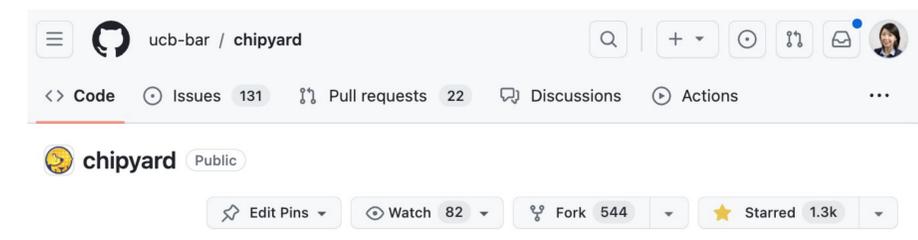
Chipyard for Education

- **Chipyard** has been used in many Berkeley courses:
 - Hardware for Machine Learning
 - Undergraduate Computer Architecture
 - Graduate Computer Architecture
 - Advanced Digital Circuits
 - **Tapeout and Bringup courses**
- **Advantages** of shared hardware framework:
 - Reduced ramp-up time for students
 - Learn once, reuse many times
 - **Enabled advanced topics like taping out chips in 1 semester and published at HotChips 2023.**



Chipyard Community

- Documentation: <https://chipyard.readthedocs.io/en/dev/>
- Mailing list: google.com/forum/#!forum/chipyard
- Open-sourced: all code is hosted on Github
- Active development with pull requests and discussions.



Acknowledgement



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