Free Chips Project:

a nonprofit for hosting open-source RISC-V implementations, tools, code

Yunsup Lee
SiFive

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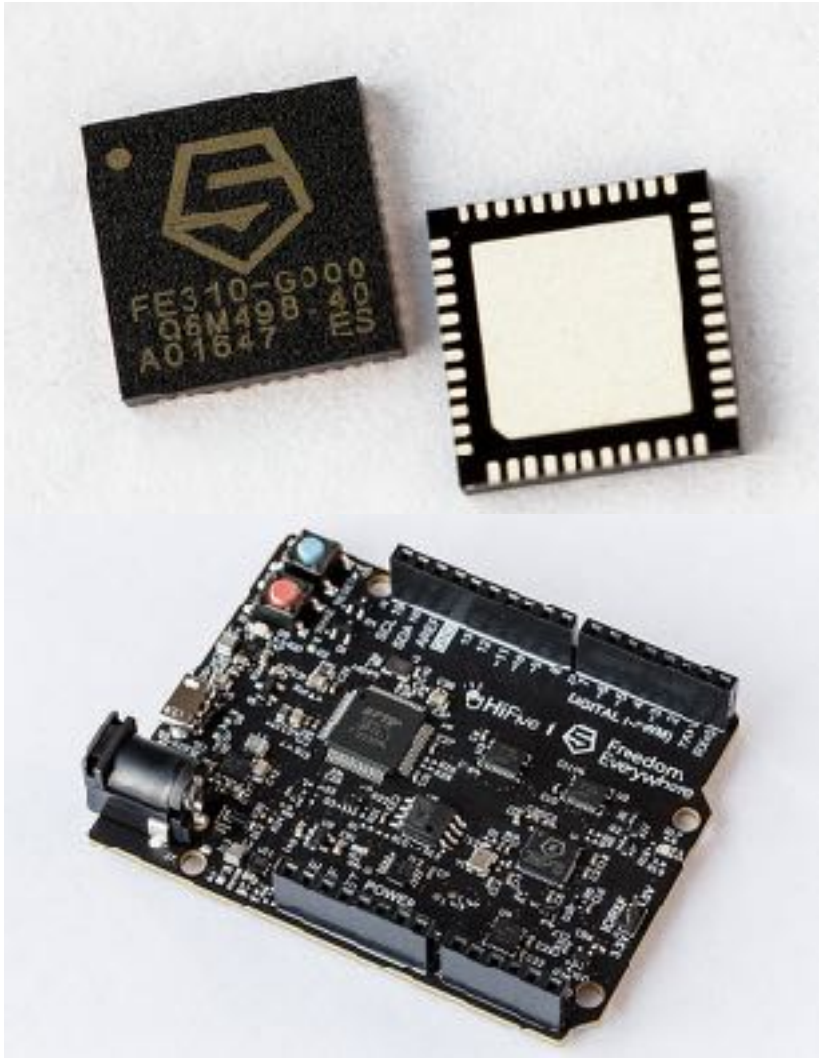
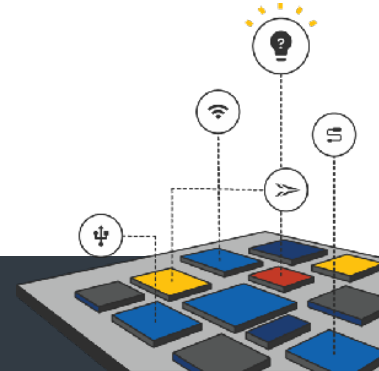
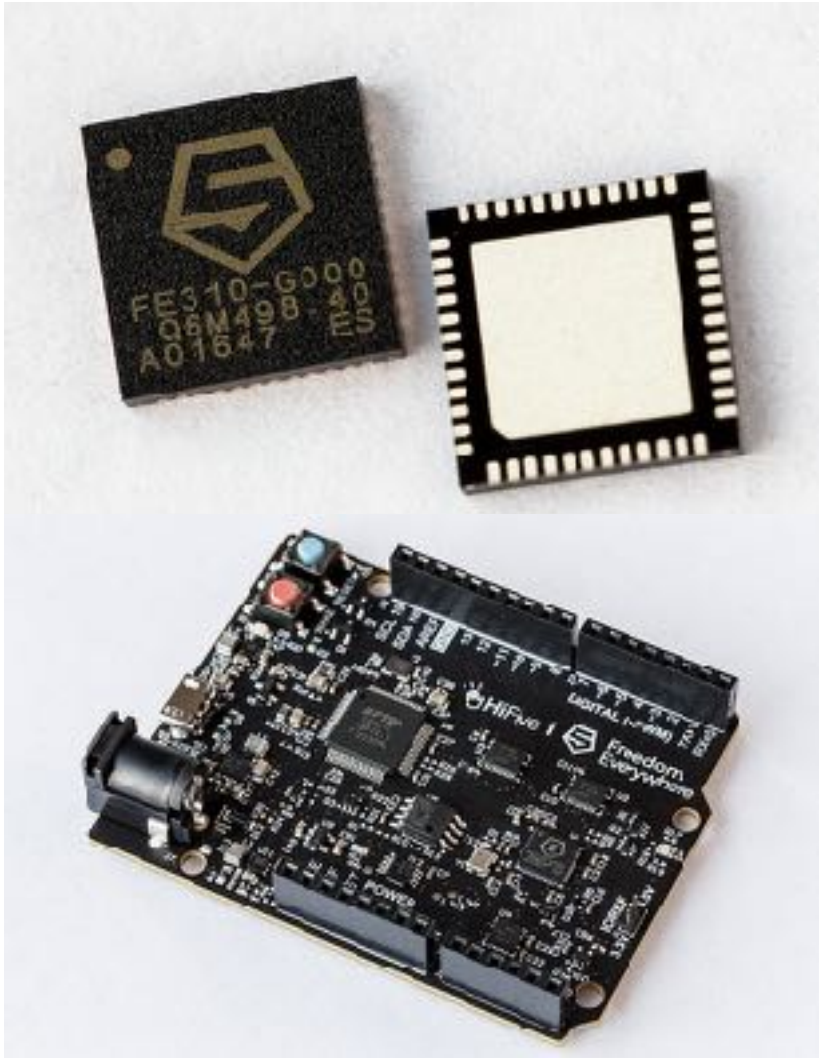
Open Source

We Open-Sourced the Freedom E310 Chip!

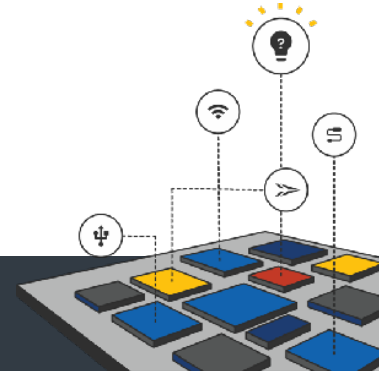




We Open-Sourced the Freedom E310 Chip!



- RTL & FPGA scripts
  - https://github.com/ucb-bar/rocket-chip
  - https://github.com/sifive/sifive-blocks
  - https://github.com/sifive/freedom
- Board Support Packages (BSP)
  - https://github.com/sifive/freedom-e-sdk
  - https://github.com/sifive/freedom-u-sdk
- Documentation & Board Schematic
  - https://dev.sifive.com
- Forums
  - https://forums.sifive.com



Rocket-Chip Generator Repository Statistics

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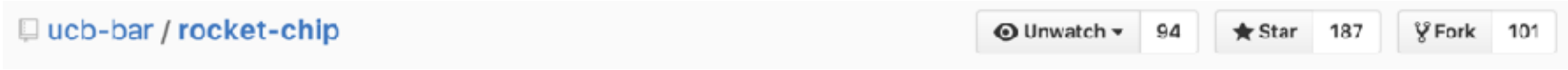

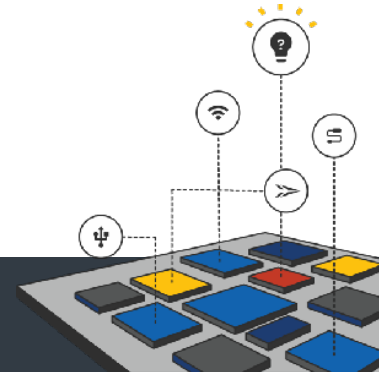

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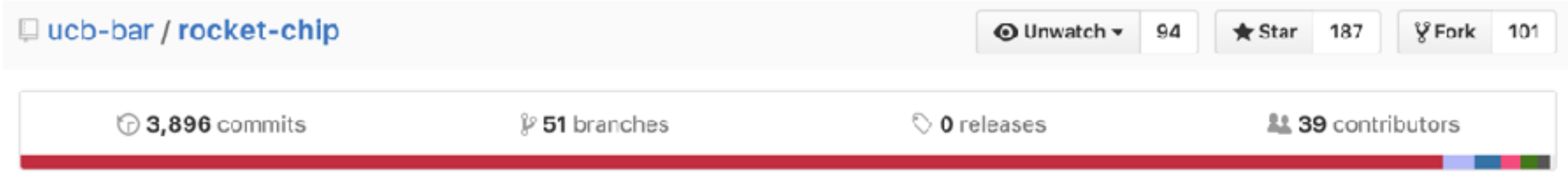

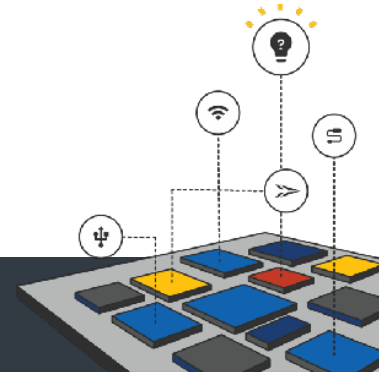

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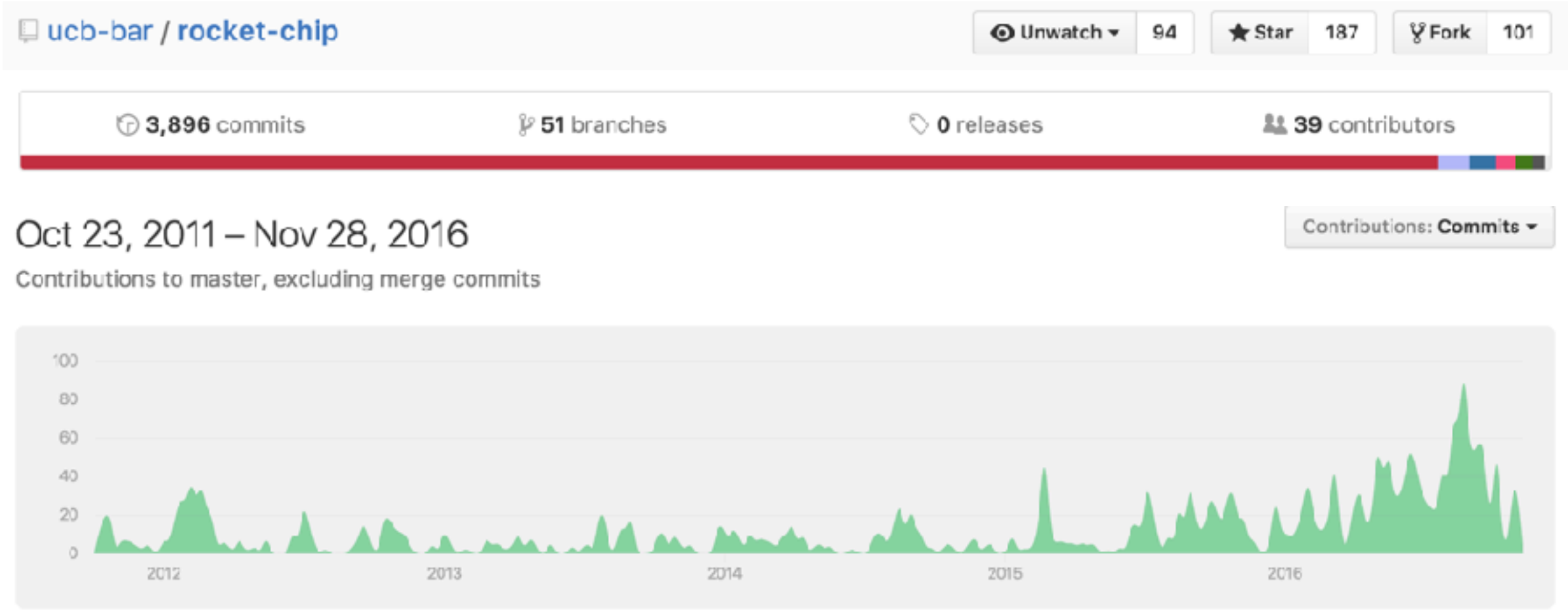
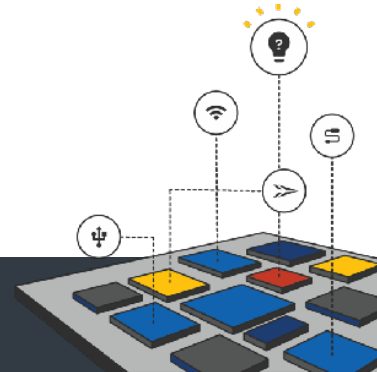


SiFive's Contribution to Rocket-Chip Repository

Our contributions are under the Apache v2 license



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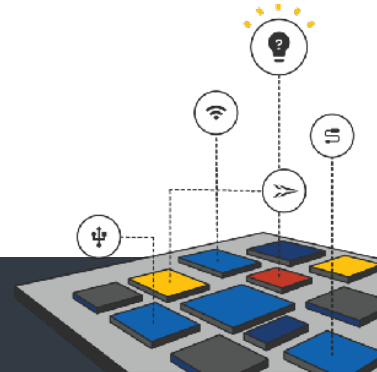

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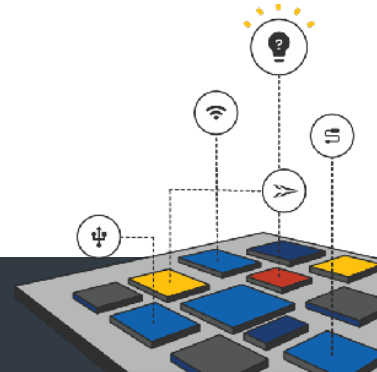

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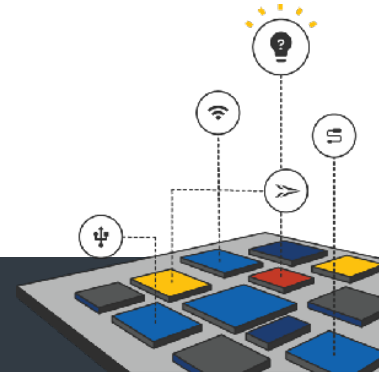

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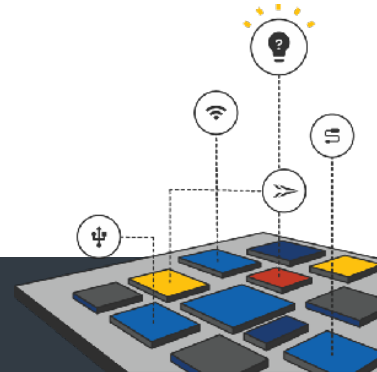
- TileLink
  - Open cache-coherent interconnect with memory-mapped I/O support
- Diplomacy
  - Global parameter negotiation framework
- Other primitives
  - Multi-clock support, clock crossings, and asynchronous reset flops

SiFive Blocks Repository

https://github.com/sifive/sifive-blocks



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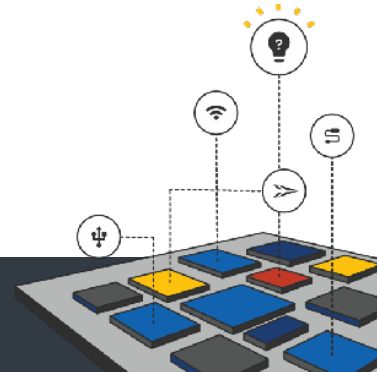

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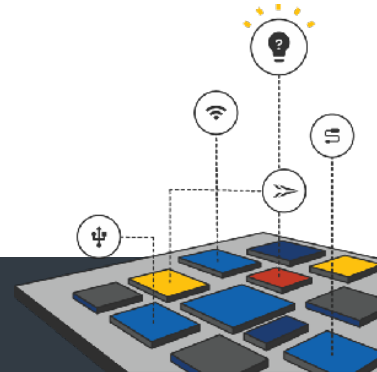

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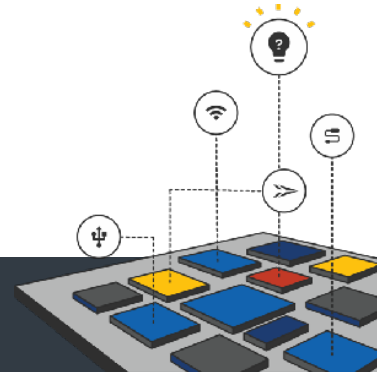
  - Written in Chisel with TileLink interfaces
- High-speed Xilinx FPGA Peripherals
  - Wrappers for MIG DDR block and PCIe block
- Our vision to make a plug-and-play SoC generator starts with these reusable building blocks



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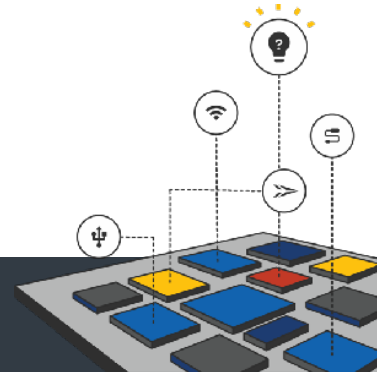

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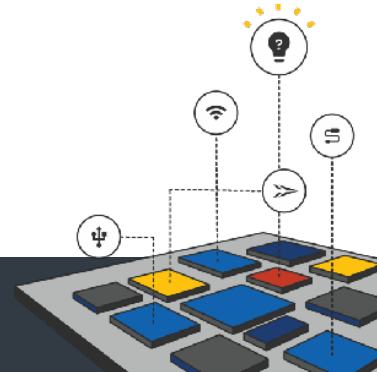

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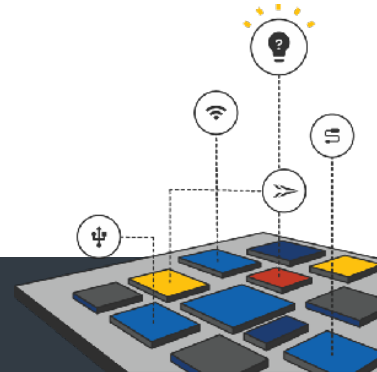
- Top-Level SoC Integration
  - Serves as a good baseline to build an SoC with your own custom blocks



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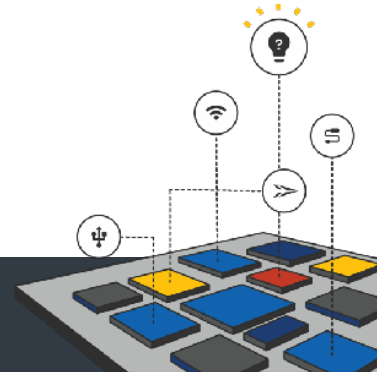
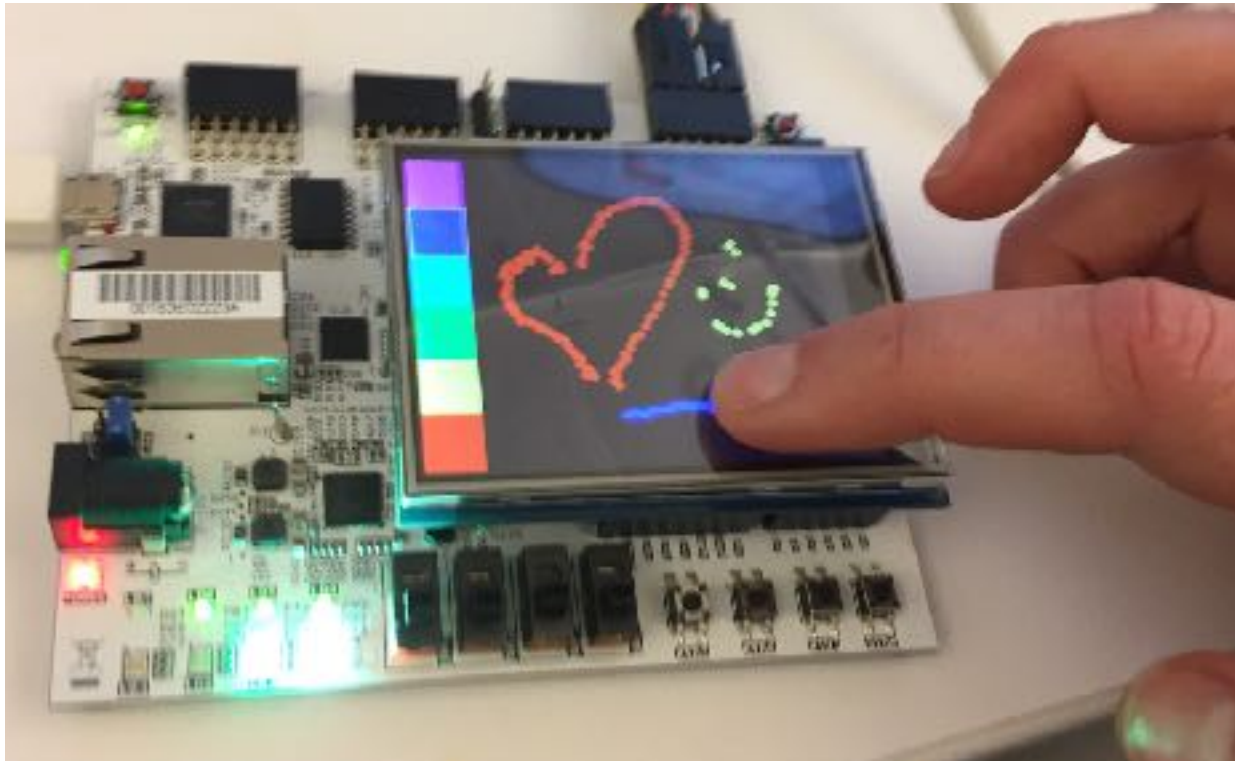
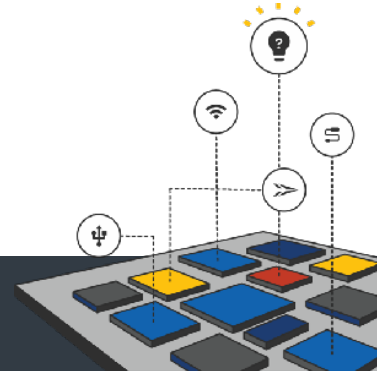
- Submodules both rocket-chip and sifive-blocks
- Top-Level SoC Integration
  - Serves as a good baseline to build an SoC with your own custom blocks
- FPGA scripts are also open-sourced
  - Freedom E300 Arty FPGA Dev Kit
  - Freedom U500 VC707 FPGA Dev Kit



Freedom FPGA Dev Kits

Start prototyping your innovative ideas on Freedom platforms!





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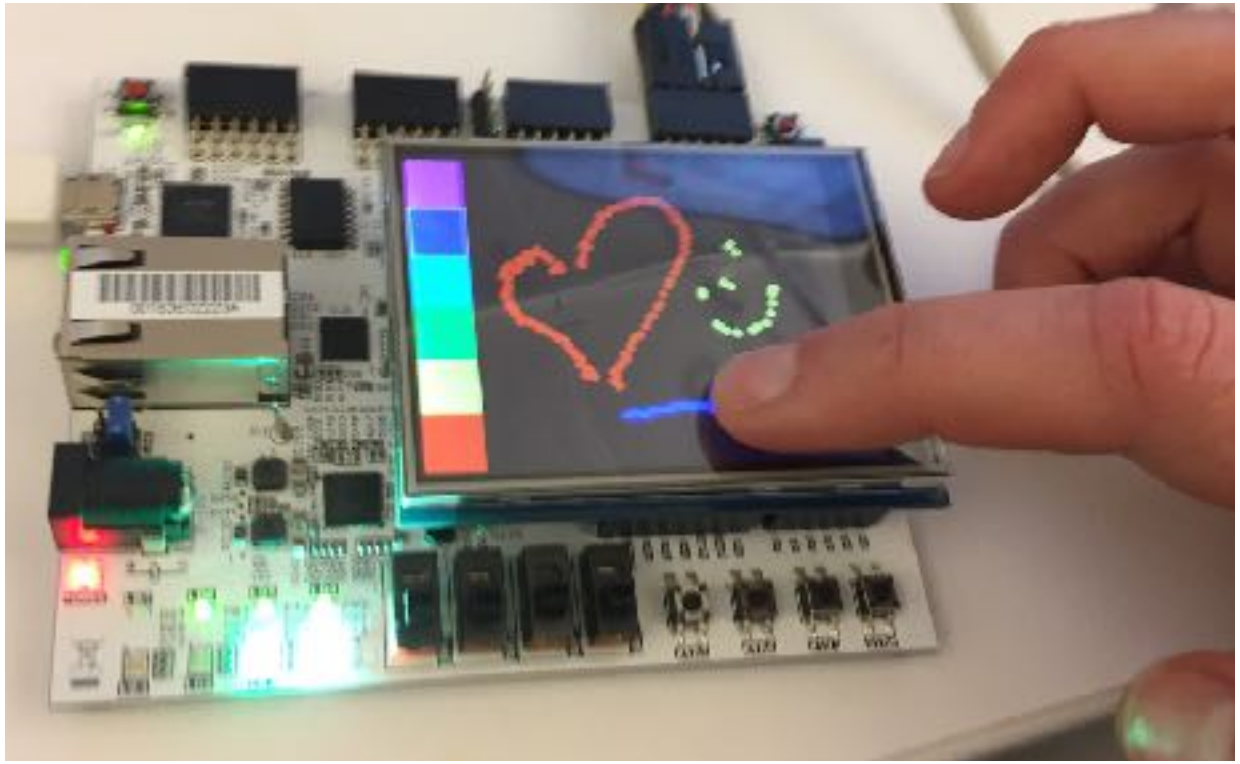

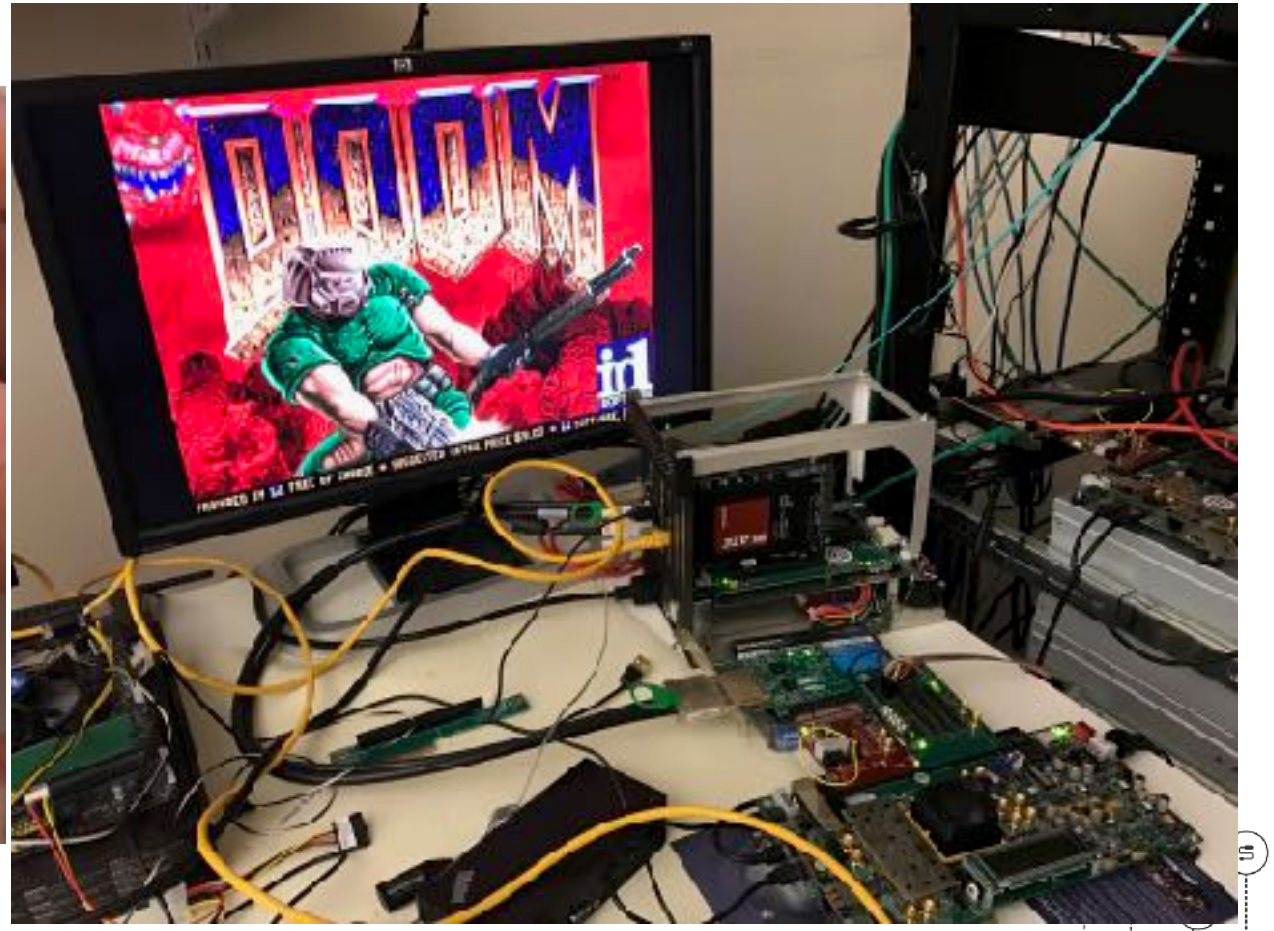

But, it takes a village to make open-source hardware real

Launching the “Free Chips Project”

Non-Profit “Home” for Open-Source Codebase

- Mission: Home for Open-Source Codebase to Enable Faster, Better, Cheaper Chips
- Initial contributions from SiFive and Berkeley
- Call for participation!
- Any questions?