

How could we achieve an Arduino-like Fast-Start for FPGAs?

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FPGAs too Hard?

- **Problem:** Students and hobbyist not using FPGAs because getting started is too hard.
- Tools: costly, hard to install, hard to use
- Platforms: costly
- Learning curve: too high
- Alternatives are better (along these axes)
 - Arduino, Mbed

Opportunity Lost

- Moore's Law delivered cheap and capable Silicon
- Maker movement
- Entrepreneurs
- IoT
- Hack-a-Thons
- Penn
 - PennApps, PennHacks, Silicon Garage, ESE111, Boot Camps

Vision

Make getting started with FPGAs as easy and inexpensive as Arduino

- Cheap hardware
- Cheap/free software
- Easy to install
- Easy to use starter tools
- Fast compiler
- Simple and meaningful exercises show life
- Freshmen started in 1.5 hour lab session
- One-day bootcamp
- Hobbyist up and running in a few hours

Achievable

- Students learning to program in elementary school and junior high
 - Scratch, Lego Mindstorms, Minecraft
- Inexpensive FPGAs (and platforms)
- Open source tools
- Undertapped research on many elements
 - (easier to use, DSLs, fast tools, ...)
- Learn from success in related areas (Arduino)

Stone Soup

- Story
- Components are there
- Need to bring them together
- Make connection, work on integration
- Few key items to develop?
 - Identify and focus attention
- What can you contribute?

Where are the Challenges?

- Tool access
- Ease-of-use, Ease-of-programming
- Starter Platforms
- Fast compilation
- <other?>

Workshop Organization

- Intro
- Arduino experience
- IceStorm
- Front End
- Fast Compile
- Tool Models
- Accessible Platforms

Working workshop

- Interaction and discussion
- Generate and refine ideas
- Open Mic slots
 - Let me know if you can contribute to the soup