Libre-FDATool Official Kickstart

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Outline

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The Libre-FDATool inception

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The Idea

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Definition

Libre-FDATool is a *free/libre* program for analysis and design of HDL digital filters from their high-level specifications.

Why Libre-FDATool?

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No FOSS software

The only alternative with similar features is the proprietary FDATool (part of Matlab DSP toolbox).

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Blueprint (I)

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Free as in freedom

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Written in Python

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User-friendly graphical interface

We aim to make Libre-FDATool easy to use, so developing a nice and handy GUI is a must. We chose the Qt/PyQt libraries for that purpose.

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Multiplatform

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Verilog and VHDL code generation, with emphasis on readability of the generated code (including testbenches).

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Multiple ways of describing filters

Multiple LTI system definitions (FIR and IIR) from high level specs, including cutoff frequencies and gains, ripple, windows, maximum order, etc.

Blueprint (III)

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Variety of filter structures

Easily expandable set of configurable structures for each filter (Direct/Transposed Forms, Linear Phase, Parallel, Cascade, CIC-Compensator, Distributed Arithmetic, etc.).

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Analysis

Built in graphical analyzer of the theoretical and quantized filters (transmittance, poles-zeros, group delay).

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Importing stimulus signals from files (waveform, CSV) as well as exporting the filtered ones.

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Advanced scope

Variety of methods for graphical analysis of stimulus and filtered signals, such as value vs time, power estimation, error, FFT, etc.

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VCD waveform graphical viewer

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All-programmable SoCs

The new generation of SoCs that puts together embedded processors with an integrated FPGA facilitates quick HW validation of HDL cores.

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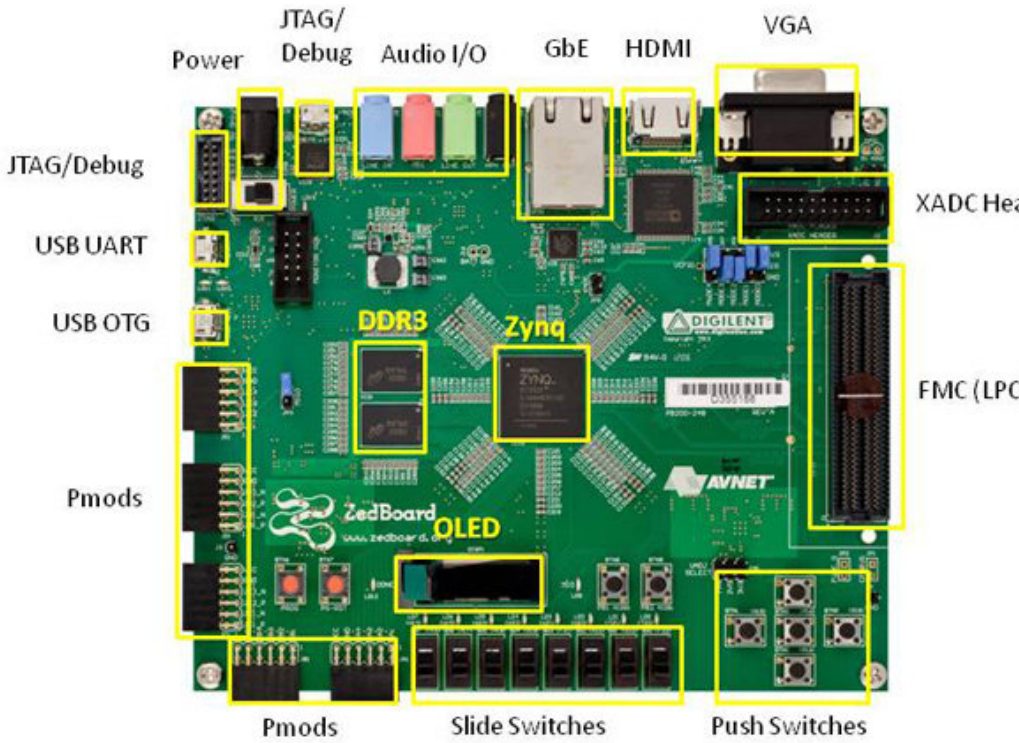
- Stimulate the IP-Core input and capture the output signal

Reference Hardware Platform

Xilinx's Zynq powered Zedboard

- Dual Core ARM Cortex-A9
- Xilinx 7 Series FPGA
- Flexible ADC
- Multimedia interfaces
- It's Open-Hardware!



Reference Embedded Operating System

Linaro: Linux on ARM

As the reference embedded Operating System, Linaro has been selected:

- Optimized for ARM architectures
- Ubuntu based Linux distribution
- Open Project
- Big community

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Export/Import capability

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Report Generation

We plan to support extensive report generation, including speed and resource estimation.

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Interface with proprietary tools

Despite the fact that Libre-FDATool is a free tool, we are interested in integrating it with mainstream proprietary tools by:

- Supporting proprietary simulators (Modelsim, Cadence, etc.)
- IP block generation for Electronic System Level tools

Roadmap (II): Planned Improvements

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Target Optimization

Platform-specific code optimizations targeted to efficiently use the resources that state-of-the-art FPGAs offer:

- DSP slices
- Embedded RAM Blocks

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Libre-FDATool in action

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Visit the Libre-FDATool channel on Youtube

We have created the "Libre-FDATool" channel on Youtube in order to demonstrate the capabilities of the tool.

▸ Libre-FDATool

Outline

Get involved in Libre-FDATool

Keep in touch

If you are interested in Libre-FDATool or want to join the development team, just take a look at the official Libre-FDATool project site:

▸ Libre-FDATool on CERN's Open Hardware Repository

http://www.ohwr.org/projects/libre-fdatool

Thank you!