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The LabVIEW FPGA Module enables engineers and scientists to develop, debug, and deploy custom FPGA code for NI hardware with user-programmable FPGAs.	6

Blemel_VS_NI

Patent

3c_BlemelUS 6938177_Blemel.pdf

FPGA vs. Microcontroller: How to choose the right one for your project.

16,204 views 14:23

<https://www.youtube.com/watch?v=jblpHUCPQYs>

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Picking the smarts of your project is an incredibly important decision. It will impact your project for its entire lifetime. A common choice is between using an FPGA or a Microcontroller as the "heart" of your design. Learn the strengths and weaknesses of FPGAs and Microcontrollers. Given project requirements, you might decide one or another, so make sure you choose correctly!

FPGA Strengths

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- Parallelization
- Lots of math, especially multiply
- Lots of I/O possible
- Highly Customizable
- High Bandwidth throughput

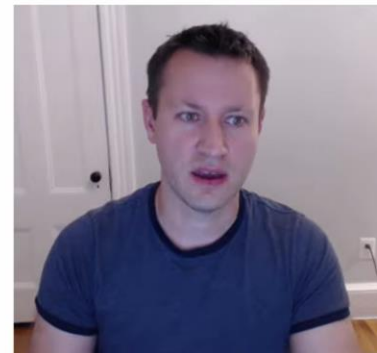


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Microcontroller Strengths

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- Cost (this is why there are so many!)
- Relative Simplicity (vs. FPGA)
- Physically small
- Many functions built-in
 - E.g. USB, UART, SPI, ADC, DAC, etc.
- Thousands of unique variants
 - Can pick exactly your need
- Low Power

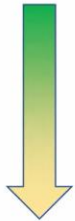


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Example #1

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- Russell is tasked with taking HD image data from a computer, filtering it, and sending it to an OLED screen to display



- Req #1 - Needs custom interfaces
- Req #2 - Lots of Math
- Req #3 - Low Power
- Req #4 - Cost



FPGA vs. Microcontroller: How to choose the right one for your project

Win

- Ocu
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- h

10:02 / 14:23 - Winner - FPGA >

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3:33 Easy Introduction

FPGA Development Boards and Integration Modules

Model	FPGA	Memory	Serial	Transceiver	Dimensions	Part Number	Price
XEM8320-AU25P	Xilinx Artix UltraScale+ XCAU25P-2E	1-GiB DDR4	128-Mib Serial (system) 256-Mib Serial (FPGA / boot)	4x SYZYGY Standard 2x SYZYGY Transceiver (TXR4)	170mm x 97mm	SYZYGY	\$1,349.95
XEM8310-AU25P	Xilinx Artix UltraScale+ XCAU25P-2E	2-GiB DDR4	128-Mib Serial (system) 256-Mib Serial (FPGA / boot)	149 FPGA fabric I/O 12 GTY transceivers	100mm x 70mm	BRK8310	\$1,149.95
XEM8350-KU060	Xilinx Kintex UltraScale XCKU060-1	4-GiB DDR4	128-Mib Serial (boot) 128-Mib Serial (FPGA)	332 28 transceiver lanes	145mm x 85mm	BRK8350 BRK8350MG	\$4,499.95

List of FPGA Companies

<https://hardwarebee.com/list-fpga-companies/>

Xilinx (AMD)

Xilinx is the leader in FPGAs for several years, Xilinx has a range of FPGAs in terms of cost and performance. Xilinx's portfolio combines devices in the categories of FPGAs, SoCs, and 3DICs, as well as software-defined development environments. Xilinx is known to use TSMC silicon technology for building its FPGAs. In October 2020, AMD acquired Xilinx for 38B USD. AMD will target high performance computing market with Xilinx FPGA technology.

Altera (Intel)

Intel acquired Altera in 2015. Altera's portfolio consists of FPGAs, SoCs with embedded processor systems, CPLDs, ASICs, and power solutions. Altera's offering covers the low, mid and upper end markets with the CPLDs and high-end FPGA.

<https://resources.pcb.cadence.com/blog/2019-cpld-vs-fpga-which-do-you-need-for-your-digital-system>

Microchip Technology

Microchip offers 4 types of programmable products: FPGAs, SoC FPGAs, Radiant-Tolerant FPGAs and Antifuse FPGAs. Those FPGA are addressing the following markets: high-bandwidth connectivity and high-data throughput, including hybrid and electric vehicles, communications, Internet of Things (IoT) infrastructure, industrial controls and automation, spacecraft, commercial aircraft and defense equipment.

The LabVIEW FPGA Module enables engineers and scientists to develop, debug, and deploy custom FPGA code for NI hardware with user-programmable FPGAs.

<https://www.ni.com/en-us/shop/electronic-test-instrumentation/add-ons-for-electronic-test-and-instrumentation/what-is-labview-fpga-module.html>

\$ 1,495.00

