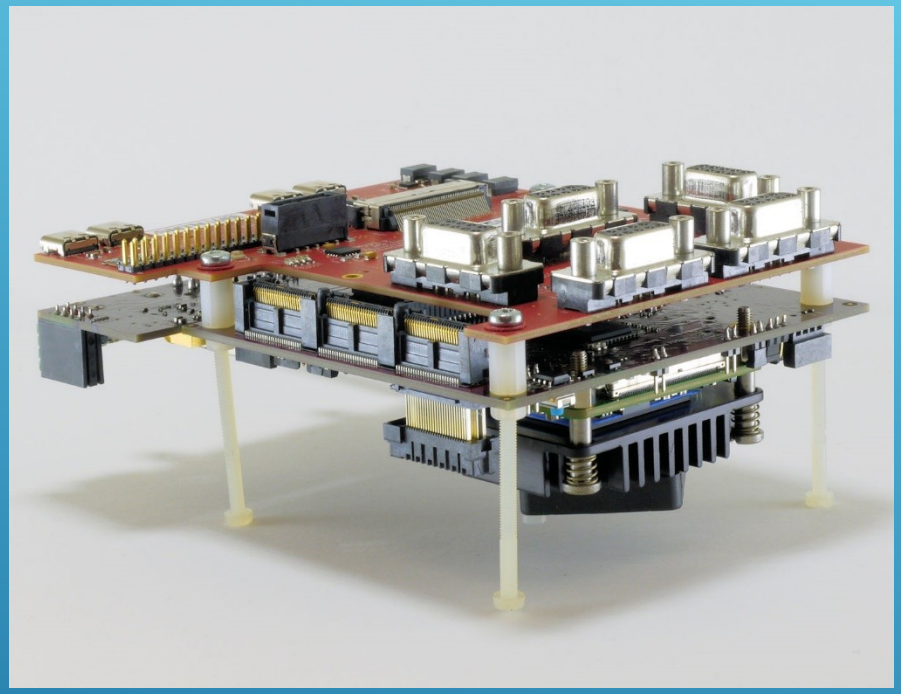
VCS-1



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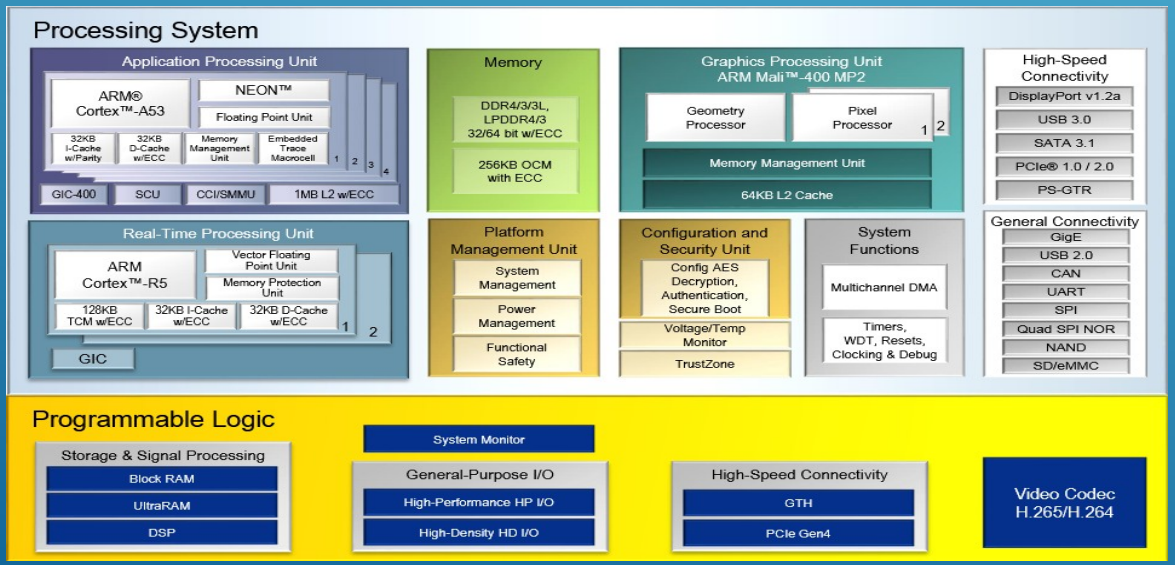
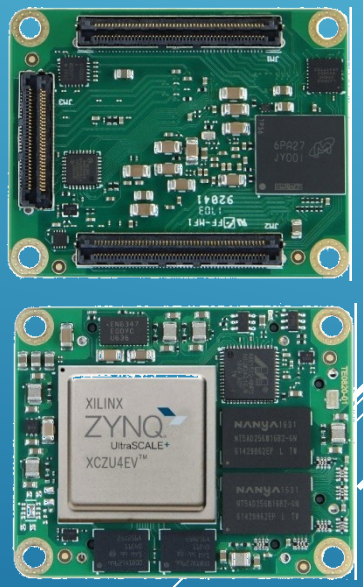
OVERVIEW

- VCS-1 overview
- VCS-1 hardware Features
- VCS-1 sensors compatibility
- VCS-1 compatibility
- Deep Learning on the VCS-1
- Applications
- VCS-1 open software and firmware
- Discussion

VCS-1 OVERVIEW

Zynq® UltraScale+™ MPSoC devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. The target device is the XCZU4EV-1SFVC784E (automotive grade)

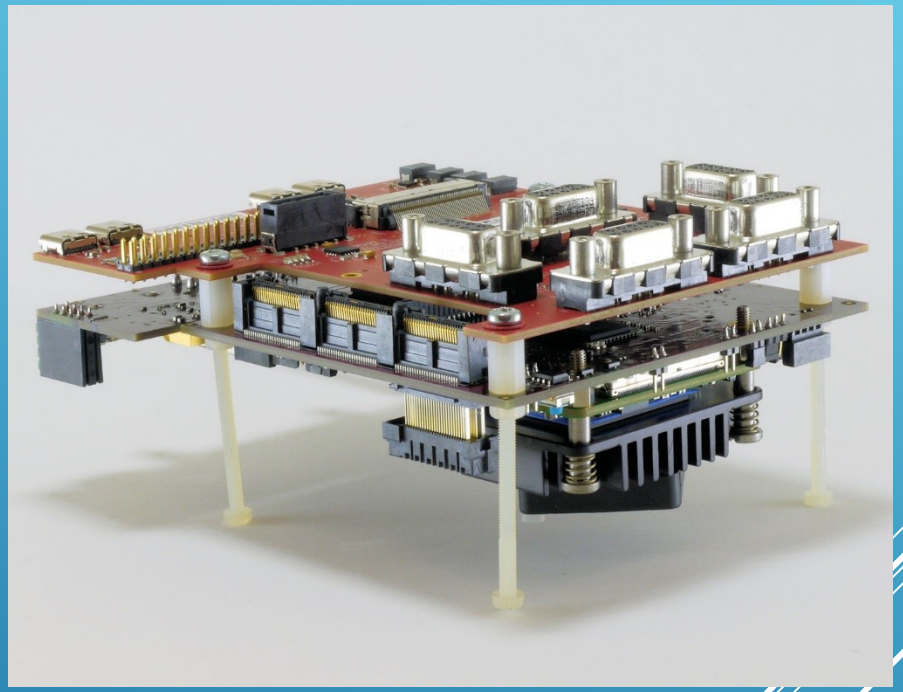




VCS-1 HARDWARE FEATURES

Connectivity:

- FM191-R; FMC-LPC to:
  - 15x Digital I/Os [DB9]
  - 12x Analogue Inputs [DB9]
  - 8x Analogue Outputs [DB9]
  - 1x Expansion [SEIC]
- FM191-U; SEIC to:
  - 4x USB3.0 [USB-c]
  - 28x GPIO [40-pin GPIO]
- FM191-A1; 40-pin GPIO
  - 28x GPIO [DB9]



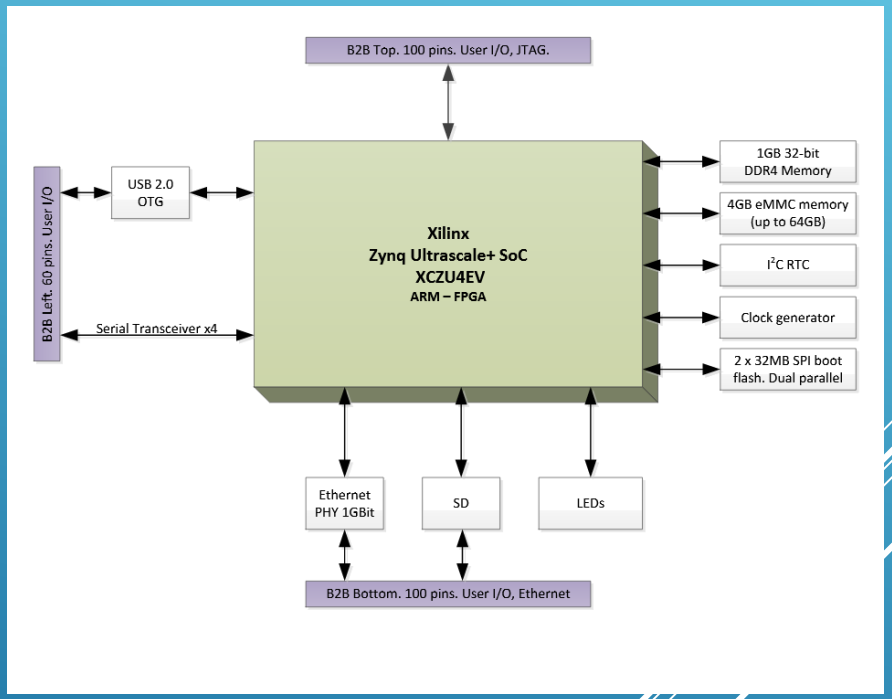
VCS-1 SENSORS COMPATIBILITY

The ZU4EV MPSoC is compatible with a wide range of sensors.

Depth sensor (up to 20m). Interface USB3.0

Thermal imaging
Interface: Eth

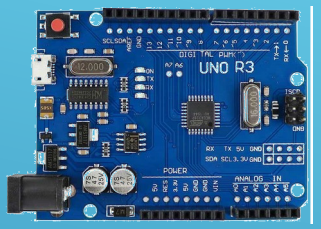
JAI AD-130GE
Interface: Eth

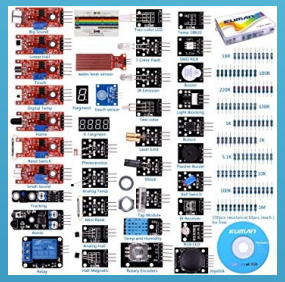


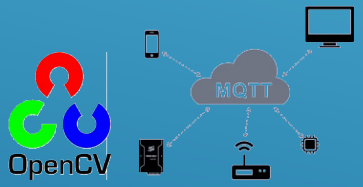
VCS-1 COMPATIBILITY

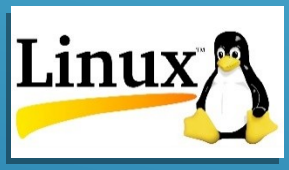
VCS-1 features:

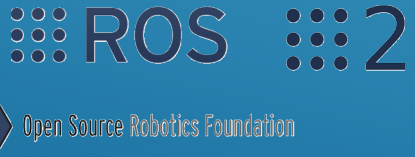
- Raspberry PI and Arduino compatible;
- Compatible with most of the Arduino/RPI sensors and actuators;
- 4x USB3.0 ports for interfacing with a wide range of sensors;
- MQTT and OpenCV compatible
- ROS compatible
- ROS2 ready
- HIPPEROS ready









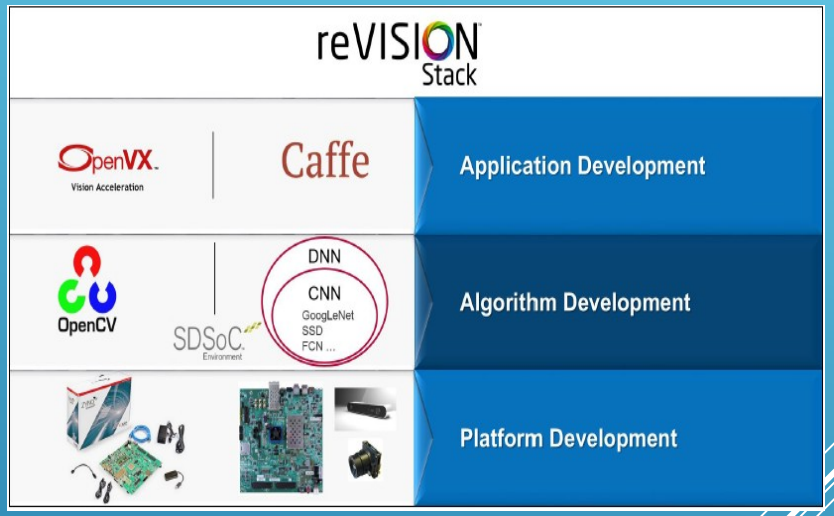


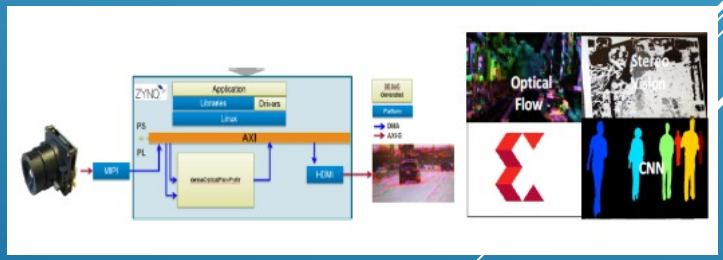
DEEP LEARNING ON THE VCS-1

The VCS-1 will be fully compatible with the Xilinx reVision stack.

- Includes support for the most popular neural networks including AlexNet, GoogLeNet, VGG, SSD and FCN.
- Optimized implementations for CNN network layers, required to build custom neural networks (DNN/CNN)

Xilinx reVISION stack





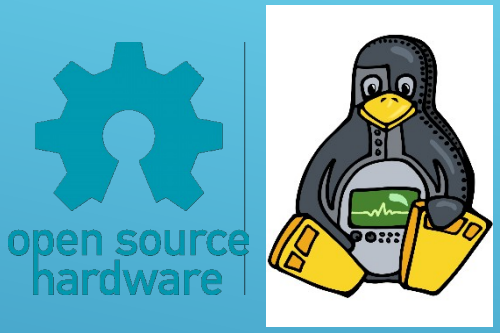
VCS-1 OPEN SOURCE SOFTWARE AND FIRMWARE

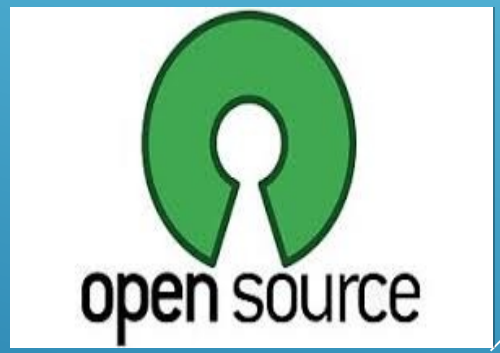
Open Source Hardware/software and online documentation:

- Open Hardware Repository

  https://www.ohwr.org/projects/emc2-dp
- Cross platform support
- FM191 Firmware
- ROS support
- MQTT support
- arm NN support
- OpenCV4 support

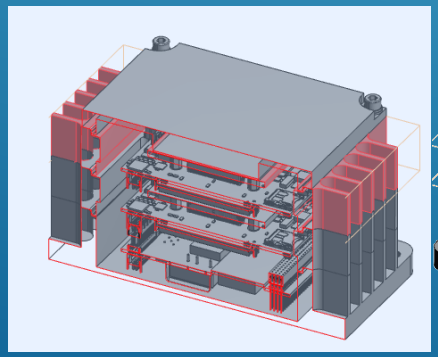
  https://github.com/SundanceMultiprocessorTechnology/VCS-1/

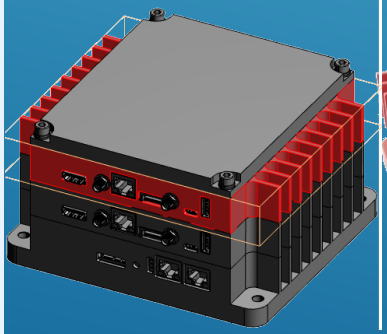


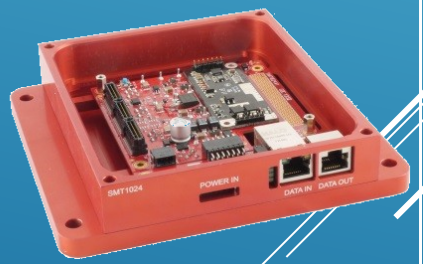


VCS-1 ENCLOSURE

A custom enclosure was specially designed for accommodating the VCS-1 system.

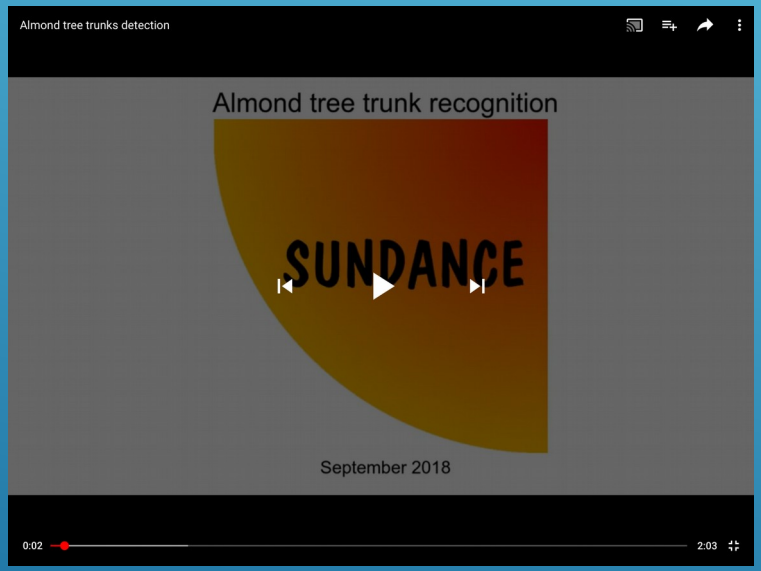






APPLICATIONS

https://youtu.be/onZqpUCNN2Q



https://youtu.be/YYECscAlRxA

DISCUSSION

The VCS-1 has the following characteristics:

1. High performance (24V@1.1A)
2. Low power consumption
3. Highly compatible with a wide range of commercially available sensors and actuators
4. Highly optimised for computer vision applications
5. Fully reconfigurable

QUESTIONS?

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