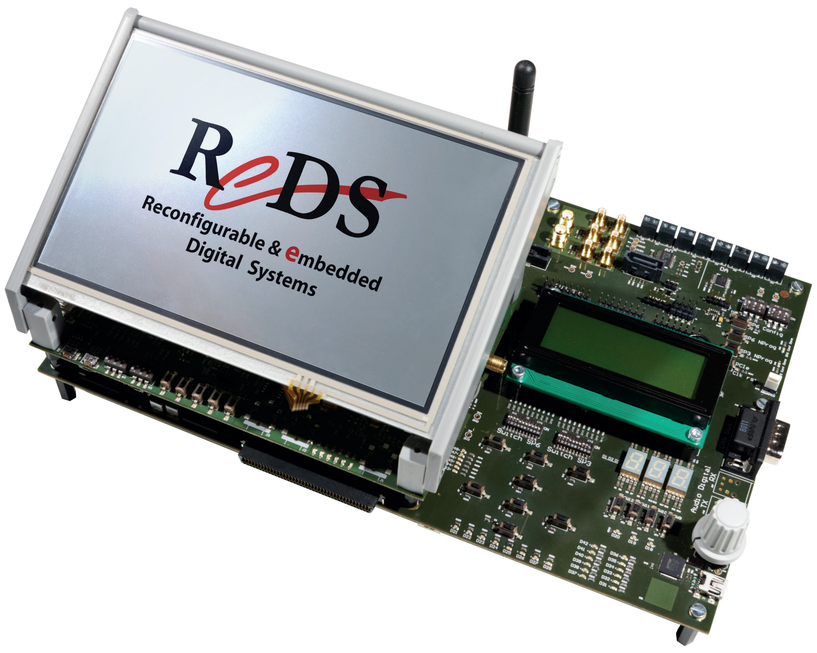
heig-vd

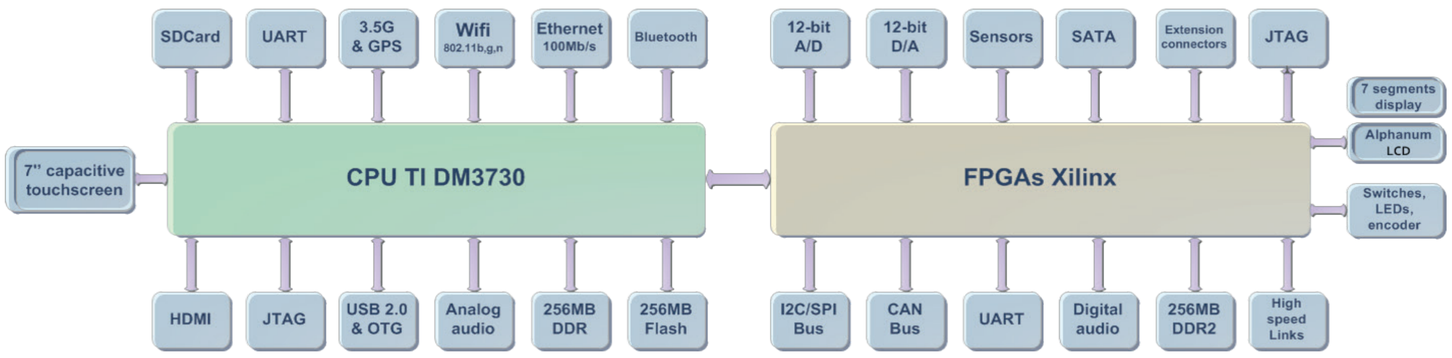
REPTAR - A UNIVERSAL PLATFORM FOR CODESIGN APPLICATIONS

ReDS
Reconfigurable & embedded Digital Systems

REPTAR is a modular and scalable platform, for both teaching and R&D purposes within the HEIG-VD, HES-SO and beyond. The project, initiated in 2011, was led and directed by the REDS Institute.

REPTAR combines an OMAP processor (itself consisting of an ARM Cortex-A8 core and a DSP) with a programmable (FPGA) Xilinx Spartan6. The platform also includes a large number of control, display and communication devices. Modular by design, it offers many opportunities for extensions.





Teaching

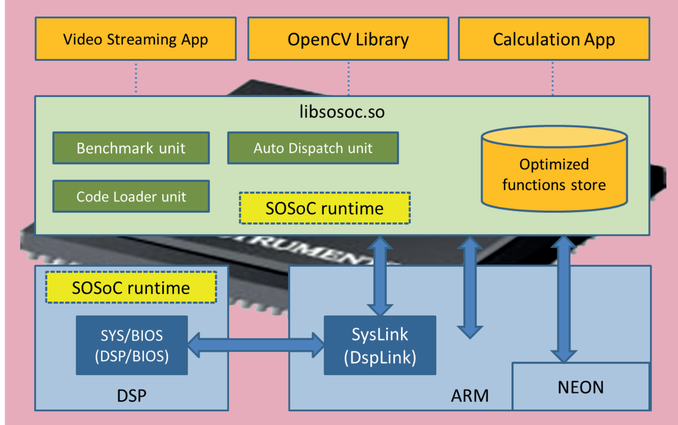
REPTAR is a versatile laboratory support board, that can be used in different courses, such as embedded computing, systems and processors architecture and digital systems. The REPTAR board federates those courses, by offering a common developing platform.

Applied Research and Development

REPTAR is a development platform suitable for many research projects. It renders needless the realization of specific cards for each project. REPTAR, HEIG-VD's technological showcase board, is ideal for demonstrations and industrial exploration projects.

http://reds.heig-vd.ch/en/rad/projects/reptar

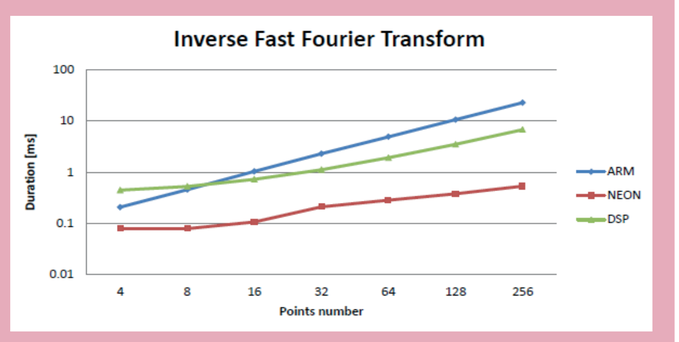
SOSoC - System Optimization using a System on Chip



SOSoC is a library that allows developers to program without knowledge of the exact architecture and equipment, but still taking advantage of all the computing power available in an embedded system.

The library itself chooses which target (ARM, NEON, DSP) to use according to a benchmarking system. Automatic dispatching selects the best candidate based on the available processing units.

The system makes it easy to measure performance and to compare them. Thus, the NEON is often thefastestduetoitsability to parallelize calculation.

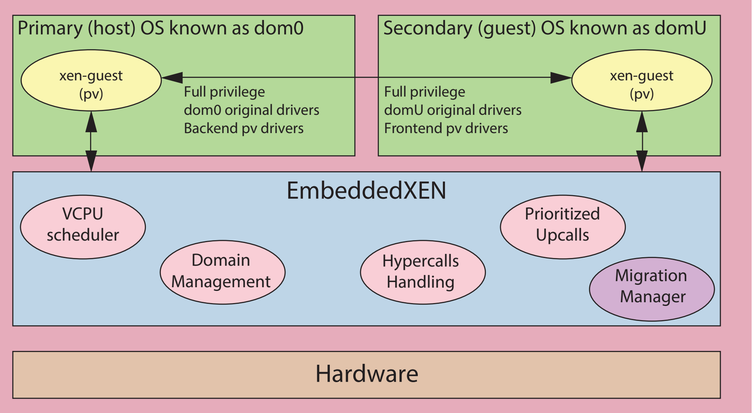


http://reds.heig-vd.ch/rad/projets/autres/sosoc

EmbeddedXen- Embedded Virtualization Framework for ARM

EmbeddedXen results from several years of research in the field of ARM-based CPUs and hypervisor technology based on XEN.

The overall architecture has been revisited in order to support the hardware diversity of ARM CPUs platforms and provides an excellent framework to deal with a native OS and a third-party OS cross-compiled for a different ARM CPU.



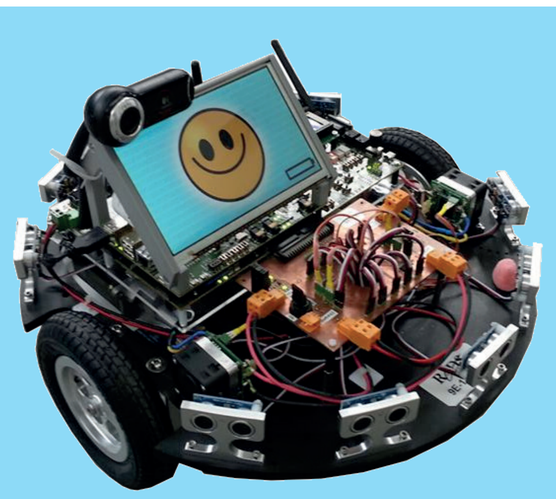
EmbeddedXen provides a virtualized hardware interface to the third-party OS. EmeddedXen supports ARM CPU cores v5-v6-v7, two (Linux-based) running OS instances, single kernel binary image easy to deploy and Virtualized interfaces for UART, block device,network, framebuffer, touchscreen and audio.

http://sourceforge.net/projects/embeddedxen/

RepBot - A robot based on the REPTAR board and controlled by smartphone

Repbot, controlled by a Linux application in conjonction with FPGA code, avoids collisions due to its multiple sensors.

An Android application communicates between a smartphone and an embedded Linux application using a WiFi connection and allows to control and monitor the robot.



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