FALX DACIAE:
Software Development Tools and
Processes for Advanced
Multimedia Applications on Mobile
Phone Multi-Core Architectures
Grant POSCCE-A2-O2.1.1
Code 499/11844

FALX DACIAE: Software Development Tools and Processes for Advanced Multimedia Applications on Mobile Phone Multi-Core Architectures

R&D Project POSCCE/A2-02.1.1/449/11844

Goal of the project: Research of the various types of advanced software applications for state-of-the-art multi-core systems, with focus on the field of multimedia on mobile phones, and development of appropriate semi-automatic tools and processes to increase the productivity of such applications.

Fields of interest: Multimedia, mobile applications, multi-core architectures, digital image and video processing, real-time systems, parallel processing, compilers and software tools.

Financed through/by: European Regional Development Fund, European Social Fund and the Romanian National Authority for Scientific Research, ANCS. Total value: ~506400 EUR.

Project implemented by: Research and development partnership between Movidius SRL. and "Politehnica" University of Timisoara.

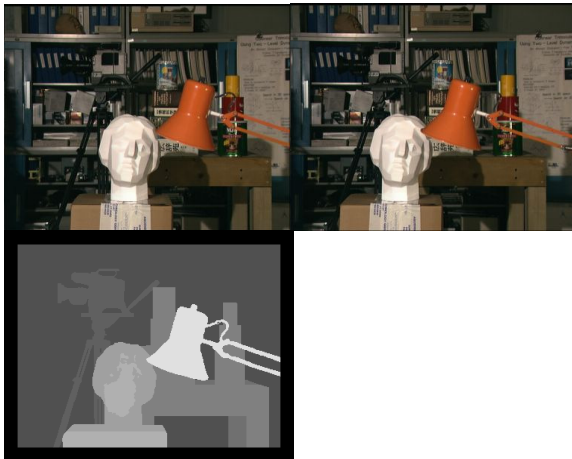**Project period:** 04.06.2010 - 03.06.2012.

Research centre:

Research Center in Computers and Information Technology, "Politehnnica" University of Timisoara
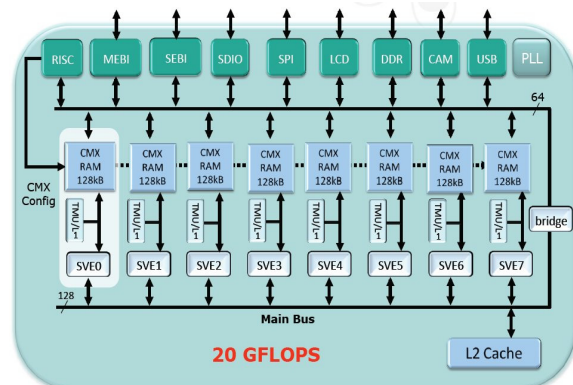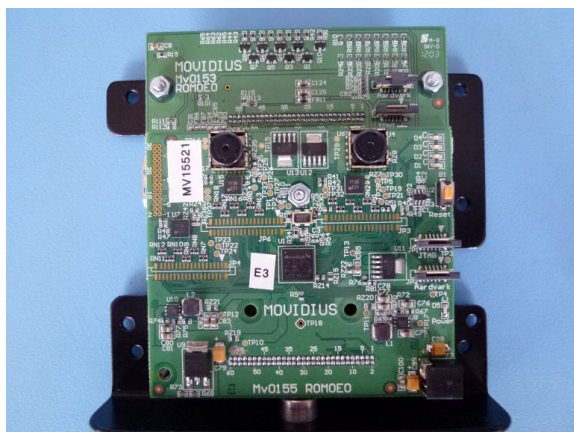
Short description of the project: The field of mobile devices and applications is currently of key interest for the scientific and industrial communities in the world. In this field, Movidius Ltd. Ireland and its branch in Timisoara have been developing a state-of-the-art multi-core processing platform for advanced multimedia applications. For instance, this architecture is able to perform complex real-time image and video processing. This project aims to study and implement the necessary software development processes and tools, to cover and optimize all the layers involved in the production of advanced multimedia applications for mobile devices, from design to operation and testing.

Main activities:

☞ Analysis of state of the art applications for the next generation of mobile devices;
☞ Development of a hardware accelerator architecture model for advanced multimedia and mobile applications;
☞ Tools for low-level software development and automatic code generation on the Movidius multi-core execution platforms;
☞ Tool for automatic partitioning of advanced application code on multi-core architectures;
☞ VLIW compiler for the Movidius devices.

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Results:

- ☑ Models and implementations of hardware interface modules in a multiprocessor system-on-chip simulator;
- ☑ Specification and requirements of a real-time multiprocessor operating system for multimedia applications;
- ☑ *moviTest* automatic application validation environment;
- ☑ *moviOS* multi-core real-time and parallel operating system;
- ☑ *moviSim* multi-core simulator;
- ☑ *moviAsm* assembler for the Sabre processor;
- ☑ *moviDebug* application loader and debugger for the Movidius execution platforms;
- ☑ *moviCompile* C and C++ compiler;
- ☑ 2 patent applications filed at the OSIM and WIPO patent offices;
- ☑ 9 scientific papers published at international conferences and symposiums;
- ☑ 11 new jobs created for highly-qualified personnel.

Applicability of the results:

All the results have been directly assimilated by Movidius. Patent application "Method and System for Detecting Frame Compatible 3D Content" filed at national (OSIM, no. A00376/05.2012) and international (WIPO, no. PCT/RO2012/000010/05.2012) patent offices.

Research team:

Project management: Dr. eng. Valentin Muresan (Movidius, project director), A/Prof. Dr. eng. Mihai Micea (UPT, project manager), eng. Cristian Cuna (Movidius, tools team leader);

Scientific council (UPT): Prof. Dr. eng. Vladimir Cretu, Prof. Dr. eng. Mircea Vladutiu, Prof. Dr. eng. Horia Ciocarlie, A/Prof. Dr. eng. Doru Todinca, Lect. Dr. eng. Mihai Udrescu-Milosav, Lect. Dr. eng. Lucian Prodan;

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Support team (UPT): ec. Florian Miclea, eng. Dorina Ruset, eng. Claudia Micea, eng. Mihaela Ciuleanu, Lidia Jebelean, Alina Mondoc, Alina Atanasescu, Nicolina Adamescu.

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