This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

AGH
AGH University of Science and Technology

www.tulipp.eu

Company/ Institute: AGH University of Science and Technology

Web-site: www.agh.edu.pl

Date/Place: 18.03.2019, Kraków, Poland

A very interesting project, especially the proposed guidelines.

Name: Tomasz Kryjak, PhD

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time. Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

BEETLEBOX

www.tulipp.eu

Company/ Institute: Beetlebox

Web-site: www.beetlebox.org

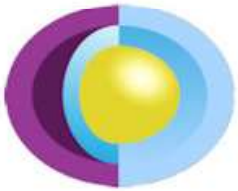
Date/Place: April 2019 - London

"In recent years, the robotics industry has seen an increase in demand to use more and more complex computer vision, whilst still retaining low power consumption. The Tulipp project, utilising the STHEM toolchain, provides developers a strong foundation for meeting real-time performance requirements, whilst remaining power-aware. The use of the Zynq MPSoC and support for industry standard "ROS" makes prototyping easy, whilst also allowing for more refined designs to achieve high performance machine vision learning and AI."

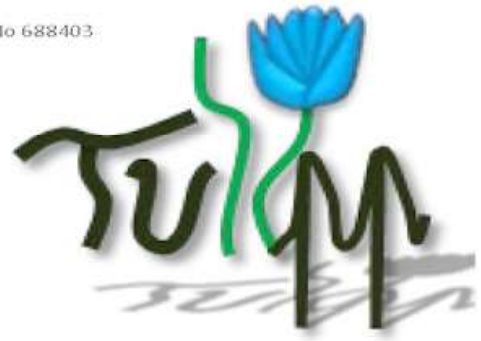
Name: Andrew Swirski – Founder and CTO

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Real Time, Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403



codeplay®



www.tulipp.eu

Company/ Institute:	Codeplay
Web-site:	www.codeplay.com
Date/Place:	March 2019, Edinburgh

The TULIPP project's greatest strength is that it is a package of hardware and software to develop embedded vision applications. One of the most unnecessarily hard problems in embedded vision applications is the difficulty of buying a suitable devkit and software tools that are packaged together and work well.

Andrew Richards, CEO & Founder

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time, Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

UNIVERSIDADE DE COIMBRA

www.tulipp.eu

Company/ Institute: Institute of Systems and Robotics

Web-site: https://isr.uc.pt

Date/Place: March 2019, University of Coimbra

Working in artificial perception computer vision for robotics using Bayesian inference and probabilistic approaches, the Tulipp reference platform and power-aware toolchain is just what I need to target resource constrained applications

Name: Jorge Lobo

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time, Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

www.tulipp.eu

Company/ Institute: Evidence Srl

Web-site: www.evidence.eu.com

Date/Place: 27th February 2019/Embedded World'19, Germany

I've never seen such a comprehensive cookbook before. I had to learn most of those things by our trial and errors. This is a nice starting point for anybody interested in Embedded System. Next could be a step by step guide on applying those recommendation and guidelines to design a complete image processing solution.

Name: Paolo Gai

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

University of Glasgow

www.tulipp.eu

Company/ Institute: University of Glasgow

Web-site: https://www.gla.ac.uk/schools/engineering

Date/Place: 07/03/2019

- The overall technical approach can be used into a large-scale system.
- RTOS supporting of Zynq SoC provides an interface for application developer a programmable environment.
- Wiki page guidance is informative but need constructed as structural format to improve readability.

Name: Dr Shufan Yang

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

IK4 IKERLAN
Research Alliance

www.tulipp.eu

Company/ Institute: IK4 IKERLAN

Web-site: www.ikerlan.es

Date/Place: March 2019, Spain

"At IKERLAN we had the chance to early (Q4-2017/Q1-2018) evaluate HIPPEROS upon a Zynq-7000 platform and we assess that its services ease the integration of multiple applications with real-time and low-power requirements into a single performance oriented multicore system; I see that this baseline is now available to the public on the GitHub STHEM site. Among the fruitful results of the project I would highlight the TULIPP Guidelines which have been made available in GitHub; they provide great help to inexpert and expert users to reproduce TULIPP results and incorporate them on research or industrial projects."

Mikel Azkarate-askasua

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

INESCTEC
TECHNOLOGY & SCIENCE
ASSOCIATE LABORATORY
PORTUGAL

www.tulipp.eu

Company/ Institute: INESC TEC – Technology and Science

Web-site: https://www.inesctec.pt

Date/Place: March 2019, Porto

The Tulipp reference platform and power-aware toolchain is an amazing tool, which enables a easy way to deploy image processing approach's and easily benchmarking their processing time and power consumption.

Name: Filipe Neves dos Santos

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time. Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

www.tulipp.eu

Company/ Institute: Ingeniarius, Ltd.

Web-site: http://ingeniarius.pt/

Date/Place: 6th March 2019, Coimbra (Portugal)

With several challenging projects being currently undertaken by Ingeniarius, including underwater robotics, unmanned aerial vehicles and heavy duty autonomous machines, the TULIPP platform has been selected as the common key element. The team has been admiring the outstanding high performance and low-power requirements of TULIPP as a way to meet the requirements of the applications at stake. Deploying robotics as Ingeniarius foresees in application areas where real-time, security by design and robustness are critical, the TULIPP embedded solution is essential and may play a strategic role in the standardisation of programming, interfaces, and robotic system architectures.

Ingeniarius hereby fully endorses the TULIPP reference platform and the outstanding team behind it that has been working non-stop to provide an ever-increasing range of features with high degree of maturity and interoperability with other devices, including the wide range of sensors used in robotics.

Micael Couceiro (CEO)

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

UNIVERSITY OF LEICESTER

www.tulipp.eu

Company/ Institute: Leicester Innovation Hub

Web-site: www.le.ac.uk/innovation

Date/Place: Leicester, 18 March 2019

I am glad to endorse the TULIPP project for its open philosophy, the exhaustiveness of guidelines, the drones for SaR use case, and for the TULIPP Agri solution

Name: Carmine Maffei

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time. Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

Quimesis
ROBOTICS ENGINEERING

www.tulipp.eu

Company/ Institute: Quimesis Robotics Engineering

Web-site: http://www.quimesis.be/en/

Date/Place: HiPEAC'19, Valencia

Comments :

*The TULIPP concept, guidelines and tools will be very valuable for our next generation of **'QuimBox'** - https://quimbox.com/en/ - for applications requiring high computation performance and energy efficience, such as mobile robotics applications we develop at Quimesis.*

TULIPP integrated in our high-performance Quimbox could enable us to get quicker in developing new solutions that combines mobile robotics with vision and AI.

Francois BAUDART

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

www.tulipp.eu

Company/ Institute: Université de Mons

Web-site: www.umons.ac.be

Date/Place: March 2019, Mons

The operating system provides entry points for designers with multiple abstraction levels by supporting tasks in C/C++, network, parallel (OpenMP, POSIX threads) and image processing (OpenCV) libraries. Guidelines are also available to help users to implement efficient embedded image processing applications with a minimum set of libraries and tools, thus unnecessary overhead.

The STHEM toolchain helps to automatically take care of implementation requirements such as power and performance with an additional support of reconfigurable hardware development flow. A generic development process simplifies the first development process iteration.

The results regarding power consumption and the detail per function and reconfigurable blocks are amazing!

Carlos Alberto VALDERRAMA SAKUYAMA

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

Sheffield Hallam University

www.tulipp.eu

Company/ Institute: Sheffield Hallam University

Web-site: www.shu.ac.uk

Date/Place: 18/03/2019

Your Quote / Comments /Feedback

Overall the approach used to build the hardware makes it suitable for easy prototyping of processor intensive embedded computer vision tacks. The fact that a mobile graphics processor, a low power CPU and a multi-processor SoC are all available on a single development board, makes it easier to partition the problem to fit the various processors. The number of video inputs/outputs already available on the hardware makes it unique for such problems. The freely available toolchain and RTOS also makes the prototyping easier, and thus focus more on my algorithmic design and optimisation. The guidelines are definitely useful and the good part is, it keeps increasing; making it useful for first time users of MPSoC

Name: Kofi Appiah

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time. Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

www.tulipp.eu

Company/ Institute: Renovatio Systems Ltd

Web-site: http://www.socfpga.io

Date/Place: 06/03/2019, Aylesbury, UK

The Tulipp project has offered a great product and a superb ecosystem for systems developers and architects to leverage the advancements in high level synthesis. It offers a great platform to prototype and bring to market image & video processing devices in relatively short amount of time.

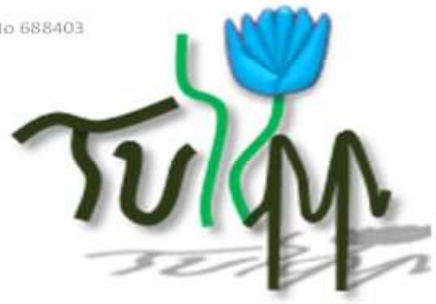
Name: Kumar Bala, Director

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time, Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 20 20 research and innovation programme under grant agreement No 688403

Think Silicon

ultra-low power | vivid graphics



www.tulipp.eu

Company/ Institute: Think Silicon S.A.

Web-site: https://think-silicon.com/

Date/Place: Embedded World 2019, Germany

The combination of Tulipp toolchain for ARM low-powers CPUs inside a FPGA that can handle I/O has appeals to a every market segment that Think Silicon are involved with. We will in the near future add support for our low-power GPU's for extra graphics performance.

Name: Georgios Keramidas

THALES RUB TECHNISCHE UNIVERSITÄT DRESDEN NTNU efficient innovation HIPPEROS Time, Proven Performance Fraunhofer Synective Labs SUNDANCE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688403

www.tulipp.eu

Company/ Institute: VISILAB

Web-site: http://visilab.etsii.uclm.es/

Date/Place: March 6, 2019 – Ciudad Real, Spain

"The whole concept of TULIPP of bringing energy efficiency from chip level to system level is super-innovative"

Name: Oscar Deniz Suarez