



COPCAMS

COgnitive & Perceptive CAMeras

EXECUTIVE *summary*

Vision systems analysing images from multiple cameras will become the norm in the future. COPCAMS leverages recent advances in embedded computing platforms to develop large scale vision systems. It aims at exploiting embedded platforms to power a new generation of vision related smart cameras and gateways.

CONTRIBUTION *to SRA*

COPCAMS will contribute to the following items of the ARTEMIS SRA:

- > The costs of the system design will be reduced due to advances on both hardware and software: On hardware by the use of common architecture for both Smart Cameras and Smart Agreggators. The use of open-source software libraries will reduce the design cost by cutting down software licensing.
- > The development cycles will be reduced for both hardware and software. Hardware: by reusing architectures also used in other industries. Software: Standard API, like Khronos' OpenCL, OpenVL, etc. will reduce overall integration times.
- > The architectures used in COPCAMS are general purpose. Usage of standard software APIs provides for easier reusability and integration, enabling cross-sectorial reusability of embedded systems and architecture platforms.

MARKET INNOVATION *& impact*

COPCAMS will leverage a large spectrum of innovative technologies in the field of low-power high-performance embedded systems and perception/vision embedded systems. This will enable innovative products (eg. surveillance systems) and services (eg. advanced manufacturing). The impact of COPCAMS will covers the complete range of the value chain:

- > Academia and SME will have embedded platforms to test and optimize innovative vision, coding and cognitive algorithms.
- > Tools and libraries providers will grow an ecosystem of users and will have the possibility to explore new markets opportunities.
- > System integrators will benefit from the powerful platforms used in COPCAMS and will be able to offer a new generation of vision related products.
- > Service providers will capitalize on the COPCAMS system to provide value added services to end users, way beyond what can be offered today.

RELEVANCE & CONTRIBUTIONS to Call Objectives

COPCAMS leverages recent advances in embedded computing platforms to design, prototype and field-test full large-scale vision systems. It aims at exploiting embedded architectures with programmable accelerator to power a new generation of vision related devices (smart cameras and gateways), able to extract relevant information from captured images and autonomously react to the sensed environment by interoperating at large scale in a distributed manner.

COPCAMS addresses two key Artemis priorities:

— *ASP5: Computing Platforms for Embedded Systems.*

COPCAMS will facilitate the transition from the highly vertically structured embedded vision systems market toward a more horizontal market, thereby creating new opportunities which may be addressed more easily by SMEs and possibly Start-Ups.

— *ASP3: Embedded System in Smart Environments*

Due to both algorithmic and computational complexity, nowadays embedded vision systems are conceived as special-purpose devices dedicated to quite narrow application domains. The COPCAMS solution will represent a significant step towards wider adoption of distributed, flexible embedded vision systems. COPCAMS will provide key enabling technologies to build smart environments, with a first application to surveillance of environments and advanced manufacturing.

R&D INNOVATION and technical excellence

COPCAMS' flexible programming model will make the resulting solution more effective than what is offered today based either on tools for a specific embedded processor and GPU or on FPGAs. The COPCAMS platform will be powerful and able to sustain complex vision analytics and video encoding functions.

COPCAMS will propose tools and libraries for image and video analysis, codecs and multi-sensors analysis: pre-processing steps to improve quality and usefulness of still images; image and video understanding, object classification and recognition; video understanding; highly-parallel video coding schemes; sophisticated data fusion; detection, tracking.

For all these fronts, COPCAMS will advance the state of the art for embedded perception & vision algorithms mainly in two ways: adaptation of these techniques to embedded architecture; the use of open source libraries to grant efficient design and reduction of costs.

The COPCAMS platform will have significant impact on all applications addressed in the project: quality of goods and improved productivity by better accuracy of inspection and more detailed assembly process monitoring; high flexibility through easy software customization; larger systems with reduced communication requirements; better in situ image/video analysis by porting server class algorithms to embedded systems; better precision and reliability of image/video processing by using higher spatial and time resolution.

PROJECT partners



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WEBSITE
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START
April 2013

DURATION
36 months

TOTAL INVESTMENT
€ 15.1 M

PARTICIPATING ORGANISATIONS
21

NUMBER OF COUNTRIES
7