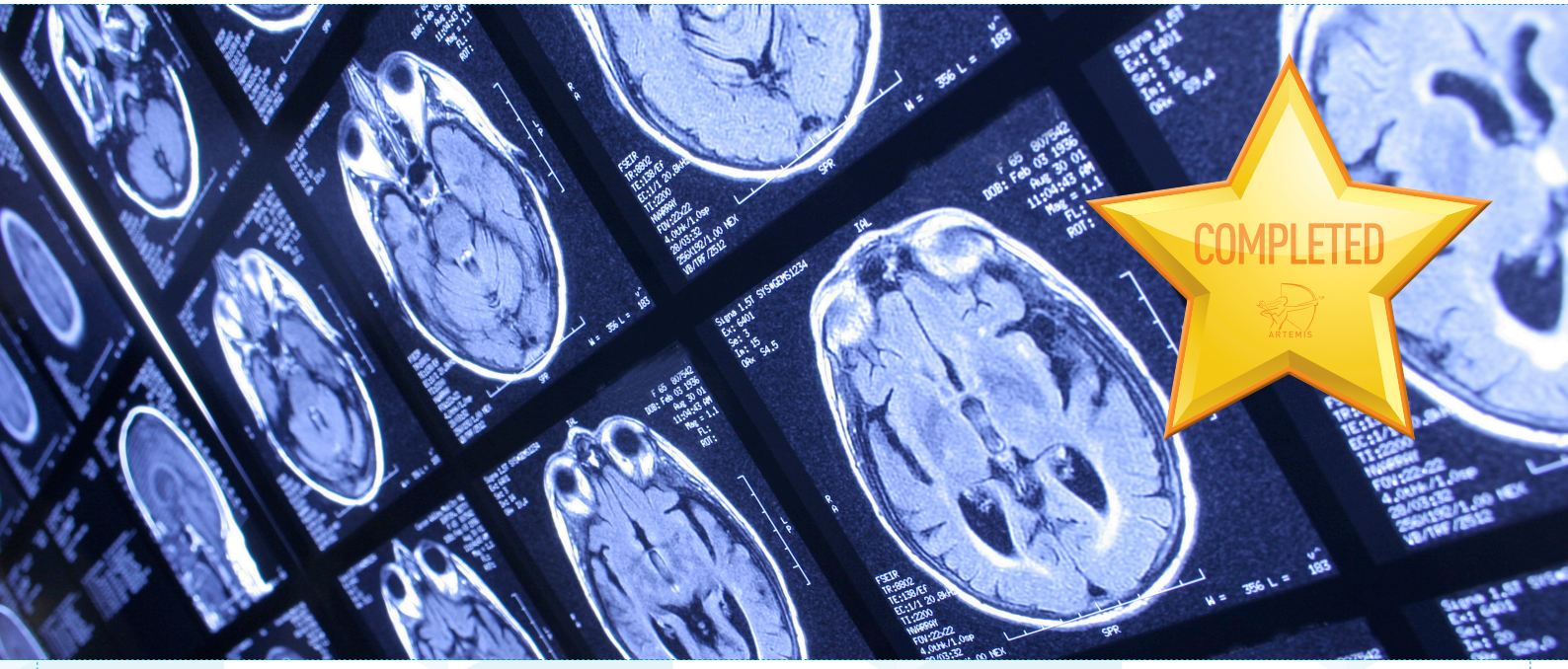
ARTEMIS Call 2010 Project
269356

# HIGH PROFILE

*HIGH-throughput PROduction of FunctIonaL 3D imagEs of the brain*




## EXECUTIVE *summary*

HIGH PROFILE aims at *"Introducing end-to-end neuro-imaging - Innovation based on leveraging cross-domain building blocks".*

With High Profile: Component based imaging platforms can be defined from cross-domain building blocks supporting the complete workflow from acquisition to image processing and visualisation. The building blocks are maximizing the use of commodity multi-core hardware.

## CONTRIBUTION *to SRA*

HIGH PROFILE targets Industrial Priority 3.1.2: Seamless connectivity and middleware, especially for the sub program **ASP2**: Healthcare systems with a focus on image diagnostic platforms for the central nervous system.

The project support four specific objectives of the AWP 2010/ASP2

- A reference architecture to support integrated care cycles
- Interoperability guidelines and selected standards
- Provision of sensors and actuators compliant to interoperability standards
- A stable, robust and extendable standard format for medical data

HIGH PROFILE also targets **ASP5**: Computing environments for embedded systems, as its will provide a generally applicable computing environment for devices that need image processing, also relevant for the nervous system application. HIGH PROFILE contributes to the following Artemis targets:

- Reduce the cost of the system design from 2005 levels by 10%, by *targeting the systems to affordable multi-core solutions coming to the market.*
- Reduce the development cycles by 15% by *flexibility, prediction and simulation in the deployment of imaging chains*
- Manage an increase of complexity of a factor 3 with an effort reduction by 10% in the *development of deployment schemes for imaging chains by using new supporting design methods and tools*
- Achieve cross-sectoral reusability of Embedded Systems devices involving imaging chains by the *application of standard imaging chain models.*

## RELEVANCE & CONTRIBUTIONS *to Call 2008/Call 2009/Call 2010 objectives*

As a market, healthcare and health & wellness represent up to 25% of the EU economy. There are several, global challenges and trends affecting the healthcare domain:

- Global economic growth: higher spending on health, access to healthcare for more people and increased awareness of available healthcare options
- Dramatic changes in demographics: the aging population
- Surging healthcare costs: growing to 15% of world wide GDP by 2015
- Healthcare professional staffing shortages
- Efficiency and effectiveness of healthcare

HIGH PROFILE addresses the global market for medical imaging showing continuous and sustainable growth and increasingly demanding

- Usage of digitised, higher resolution images
- Move towards multi-modality imaging
- Move towards minimal invasive intervention
- Move towards functional imaging

HIGH PROFILE aims to deliver a significant contribution to diagnosis and therapy of illnesses of central nervous system and brain. It exploits high-performance digital signal processors and computing and content management platforms and makes the data available when and where required.

HIGH PROFILE contributes to the Artemis Sub-programme ASP2 expected impact:

- Reduction in visits to doctors and hospitals and shorter periods of hospitalisation
- Greater longevity with improved quality of life throughout

HIGH PROFILE contributes to the Artemis Sub-programme ASP5 expected impact in the image processing domain:

- Establishment of a common multi-domain architecture for advanced multi-core hardware and middleware solutions
- Establishment of heterogeneous multi-domain architectures
- Definition of performance and resource management models.

## R&D INNOVATION *and technical excellence*

HIGH PROFILE:

- Deploys software based image processing most effectively on commodity hardware systems, which is increasingly becoming multi-core.
- Enables dynamic composability, predictability, parallelisation, aggregation and run-time management of image processing systems.
- Applies for a multitude of image processing applications and focuses on imaging for diagnostics for the brain, central nervous system and head/neck area.

A patient with a neurological problem goes to see his physician. The physician needs the best possible information on the brain.

In order to provide better treatment of neurological diseases High Profile aims to deliver:

- Software systems that integrate information from multiple sources, such as MRI, EEG and NiRS, to provide insight into into 3D and 4D brain activity
- Map this software on a hardware platform specifically conceived to be an evolution of the IT infrastructure in hospitals and medical centers
- Develop standard-based interoperable solution architecture to support clinical workflows associated with the use of advanced medical technology.

Topics of attention in the project:

- Cross domain embedded technologies for very fast image processing
- Compensation for patient movement and sharper images
- Workflows for different imaging modalities
- Visualisation and application of the data in a clinical workflow

Technical innovation:

Image acquisition

- Context adaptive image capturing from multiple sources
- Increasing resolution & frame rate up to real time

Image processing:

- Extracting the most relevant, and accurate information out of the image data
- Imaging chain cross domain software building blocks
- low latency large data processing on multicore COTS

Visualisation of key information from images

- Fast and easy access to 2D, 3D & 4D imagery within clinical workflow
- Large data distribution with short latency

## PROJECT *partners*

PHILIPS, neagen, University of Eastern Finland, g.tec Guger Technologies, Universitair Medisch Centrum Utrecht, FEI Company Tools for Nanotech, AnyWi, Zorg Gemak De nieuwe generatie gezondheidszorg, AIT Austrian Institute of Technology Tomorrow Today, VTT, Barco Visibly yours, personal space technologies, VISION www.vision.fi, Informatanæ Studiorum Universitatis Siculiæ, Eagle Vision, Alma Mater Studiorum A.D. 1088, ST

ARTEMIS

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High Profile


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WEBSITE
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START
April 2011

DURATION
36 months

TOTAL INVESTMENT
€ 17.12 M

PARTICIPATING ORGANISATIONS
17

NUMBER OF COUNTRIES
5