



PROJECT PROFILE

Creating content-aware systems

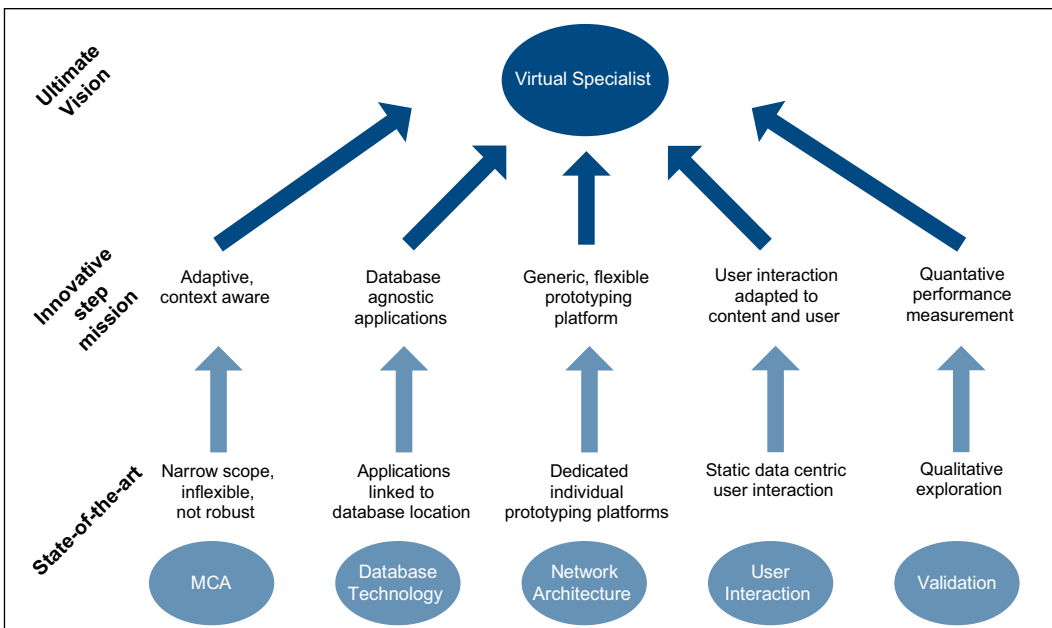
Providing tailored virtual specialist support

Digitisation together with the availability of high bandwidth and cheap storage has resulted in the availability of massive amounts of audio-visual content. As a result, the need for more in-depth knowledge about this content is emerging. Finding relevant pieces of information in such large amounts of data is an ever-increasing challenge; however, existing multimedia systems have hardly any consciousness about the content they are processing. CANTATA is setting out to change this.

Our world has become increasingly digitised for more than two decades now, and the revolution is continuing. While the first wave of digitisation focused on obtaining the perfect form of noise suppression, the second wave was based on the fact that digitisation allows easy editing.

The third wave of technological breakthroughs is building on the fact that digitisation also allows for interpretation of content. This is where content-aware systems come into play. Think of a television set that understands what programme is on, or a surveillance camera that comprehends what is happening in the scene it is monitoring.

Overcoming the limitations This third wave of going digital is still in its infancy, however. The notion of content can have different levels of semantic comprehension, detail and accuracy, ranging from motion detection and colour measurements, up to genre classification and detailed image understanding. The current state-of-the-art is that partial awareness is feasible, albeit limited to very constrained application environments.



Aiming at a virtual specialist

CANTATA (ITEA 05010)

Partners

- ACIC
- Barco
- Bosch Security Systems
- Capacity Networks
- Codasystem
- CRP Henri Tudor
- Hantro
- IBBT
- I&IMS
- INRIA
- Kingston University
- Multitel
- Philips Consumer Electronics
- Philips Electronics Netherlands
- Philips Medical Systems
- Solid
- Telefónica
- Traficon
- Technische Universiteit Eindhoven
- University Pompeu Fabra
- University of York
- VICOMTech
- VTT

Countries involved

- Belgium
- Finland
- France
- Luxembourg
- The Netherlands
- Spain
- United Kingdom

Project start

July 2006

Project end

June 2009

Contact

Project Leader:  
 Paul Merkus  
 Bosch Security Systems,  
 the Netherlands

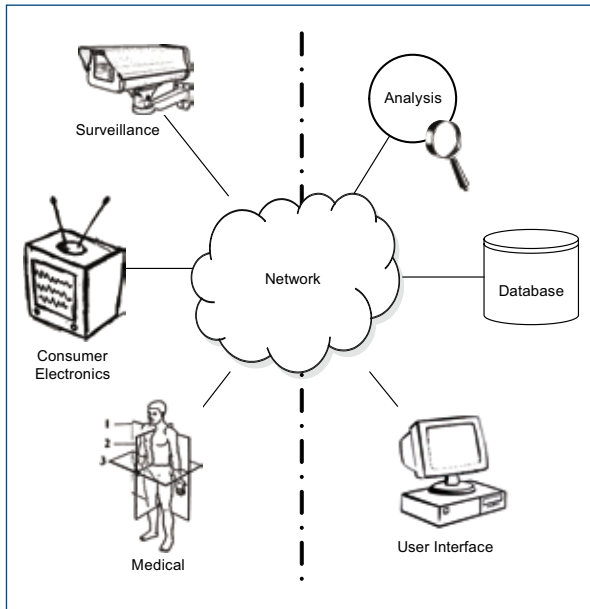
Email:

paul.merkus@nl.bosch.com



## PROJECT PROFILE

The goal of the CANTATA project is to develop a system that is *fully content aware* and has *understanding* of the content that it is processing. Such a system can be described as a *virtual specialist* as it will *apply the knowledge* to assist the real-life decision-making expert. These specialists are needed in several application domains such as surveillance, medicine and consumer electronics as a *virtual security officer*, a *virtual clinician* or a *virtual butler*.



Application domains and technologies

### Multiple technologies involved

Multiple technological areas are involved in creating robust applications with better scene understanding; and all the areas need to be advanced towards the common goal of the virtual specialist.

CANTATA will make an inventive step in each of five critical technologies to bring the ultimate goal of a fully content-aware system closer to reality:

1. **Multimedia content analysis** (combining audio and video content analysis) needs to be expanded from 2D to 3D with detailed object models, together with prior knowledge

of a constrained application environment. And self-learning and adaptive systems will be realised to cope better with less constrained applications;

2. **Database technologies** require a data-management platform for interoperable and distributed storage, processing and delivery of multimedia content and metadata across different platforms and terminals;
3. **Network architecture** is required to support distributed resource decisions as the execution platform for advanced video processing applications becomes increasingly dispersed. The software and system architecture will have to separate the co-ordination of applications from the computations they perform, given the increased mobility of devices involved;
4. **User interaction** will also be strongly influenced by the content awareness of the system. The user will no longer be confronted with options that are not relevant to the content at hand; and, finally,

5. **Validation** of content-aware systems needs to be addressed better. Although there is a call for smart surveillance cameras, how 'smart' a camera can be is not currently defined. It is necessary to define parameters and validation techniques that allow quantification of the performance of the future virtual specialists.

### Three virtual specialist demonstrators

The CANTATA project will realise demonstrators of three virtual specialists and make use of these representations to find and prove the essential techniques for establishing such specialists. The resulting *virtual security officer*, *virtual clinician* and *virtual butler* will increase safety, health and quality of life.

### ITEA Office

Eindhoven University of Technology Campus  
Laplace Building 0.04  
PO box 513  
5600 MB Eindhoven  
The Netherlands  
Tel : +31 40 247 5590  
Fax : +31 40 247 5595  
Email : itea2@itea2.org  
Web : www.itea2.org

ITEA - Information Technology for European Advancement - is an eight-year strategic pan-European programme for pre-competitive research and development in embedded and distributed software. Our work has major impact on government, academia and business.

ITEA was established in 1999 as a EUREKA strategic cluster programme. We support coordinated national funding submissions, providing the link between those who provide finance, technology and software engineering. We issue annual Calls for Projects, evaluate projects, and help bring research partners together. We are a prominent player in European software development with some 10,000 person-years of R&D invested in the programme so far.

ITEA-labelled projects build crucial middleware and prepare standards, laying the foundations for the next generation of products, systems, appliances and services. Our projects are industry-driven initiatives, involving complementary R&D from at least two companies in two countries. Our programme is open to partners from large industrial companies, small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

