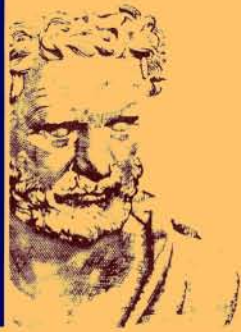


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NCSR "DEMOKRITOS"

INSTITUTE OF
INFORMATICS &
TELECOMMUNICATIONS



5 YEARS' MANAGEMENT REPORT

2005-2009

NATIONAL CENTRE for SCIENTIFIC RESEARCH "DEMOKRITOS"

INSTITUTE OF INFORMATICS AND TELECOMMUNICATIONS

<http://www.iit.demokritos.gr>

5 YEARS' MANAGEMENT REPORT 2005-2009

The Institute of Informatics and Telecommunications (IIT) conducts research in the areas of telecommunications, networking, technologies for the World Wide Web (Web) and Intelligent Computer Systems. Its aim is excellence in the areas where they activate, for the benefit of society and the development of the knowledge economy. Emphasis is given both on the development of modern networks and telecommunications systems for reliable access everywhere to information and knowledge, and also on the discovery user-friendly methods and techniques for identification, representation and management of new knowledge.

The Institute is oriented so to the long-term basic research as to the applied research, implementing specific R&D projects. At the same time it plays an active role in training new research potential providing scholarships to graduate and post - doctoral level and their employment in research projects. Also special emphasis is given to the exploitation of research results and its general dissemination.

The composition of the activities of IIT is presented in the following diagram

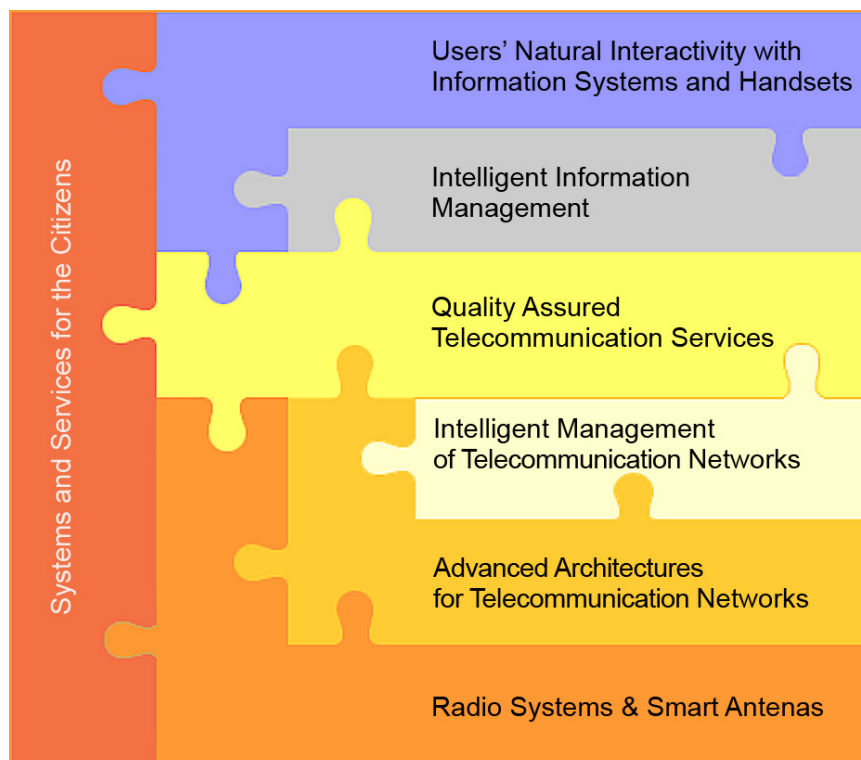
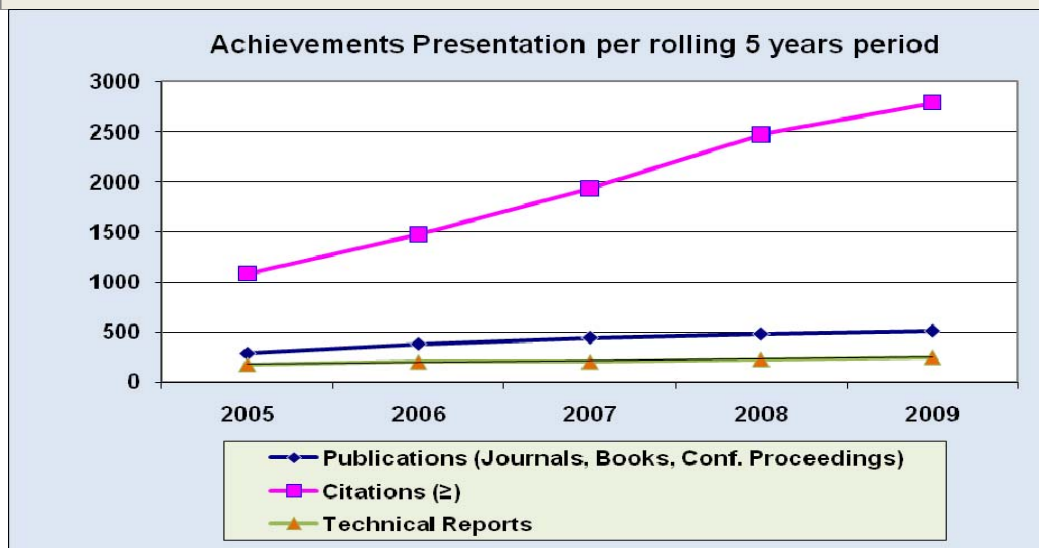
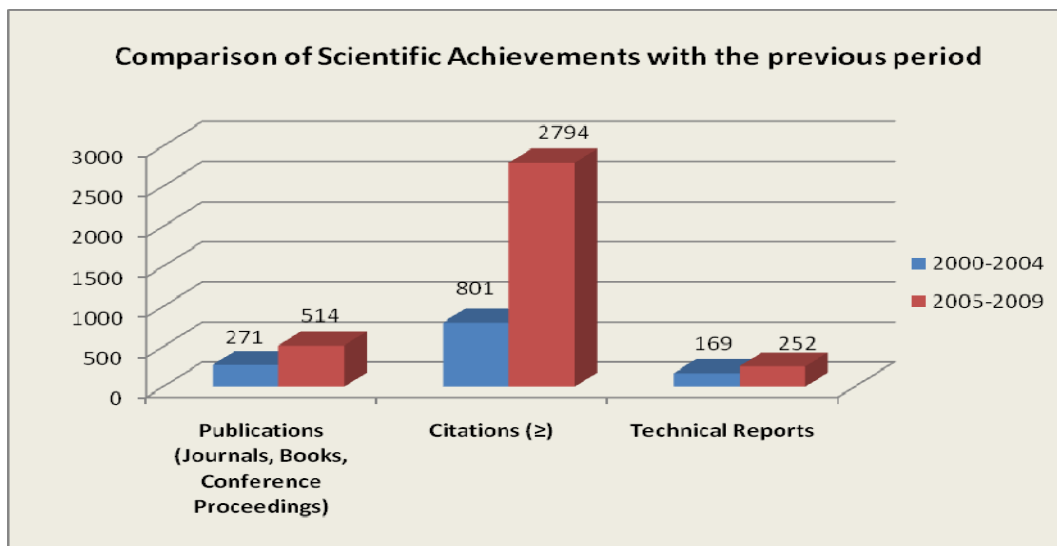
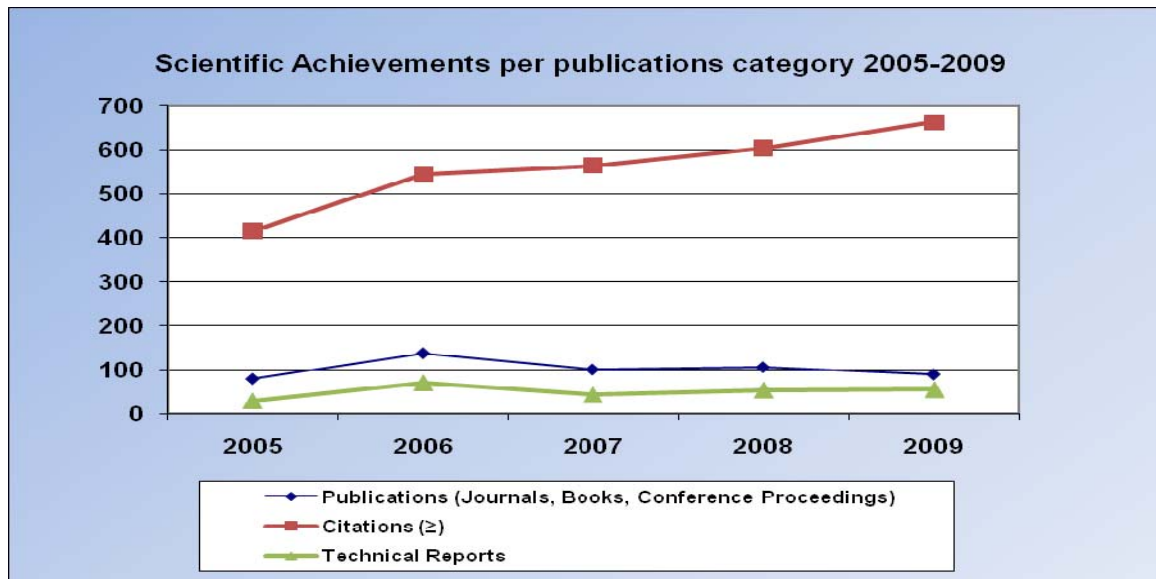


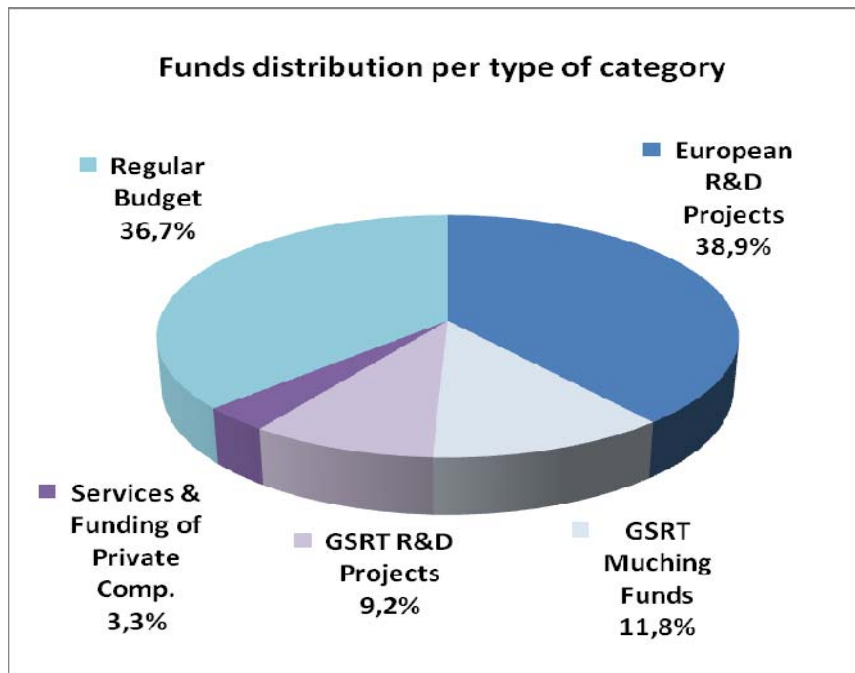
Chart Synthesis of Research and Technology activities for IIT

Results of Scientific Achievements

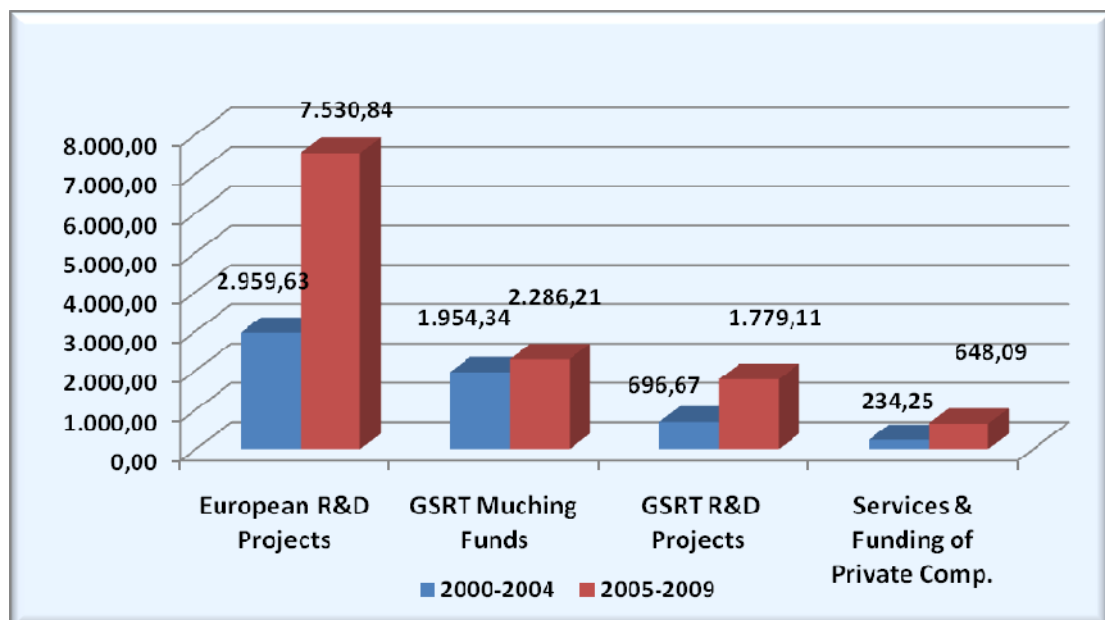


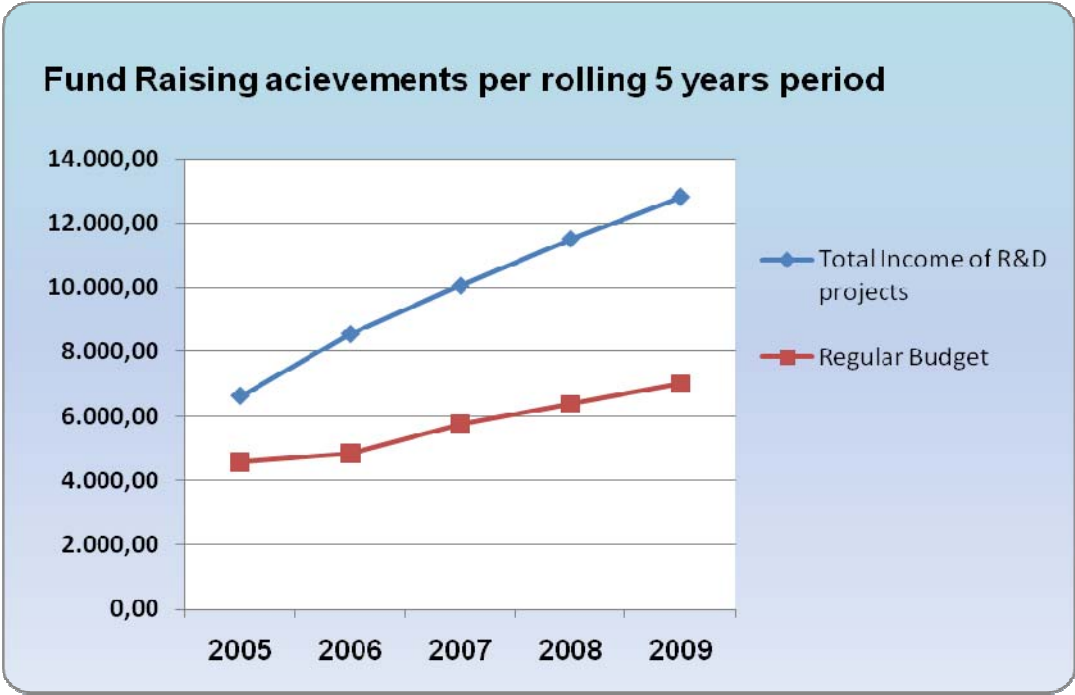
Fund Raising Results

Incoming Funding Period 2005-2009

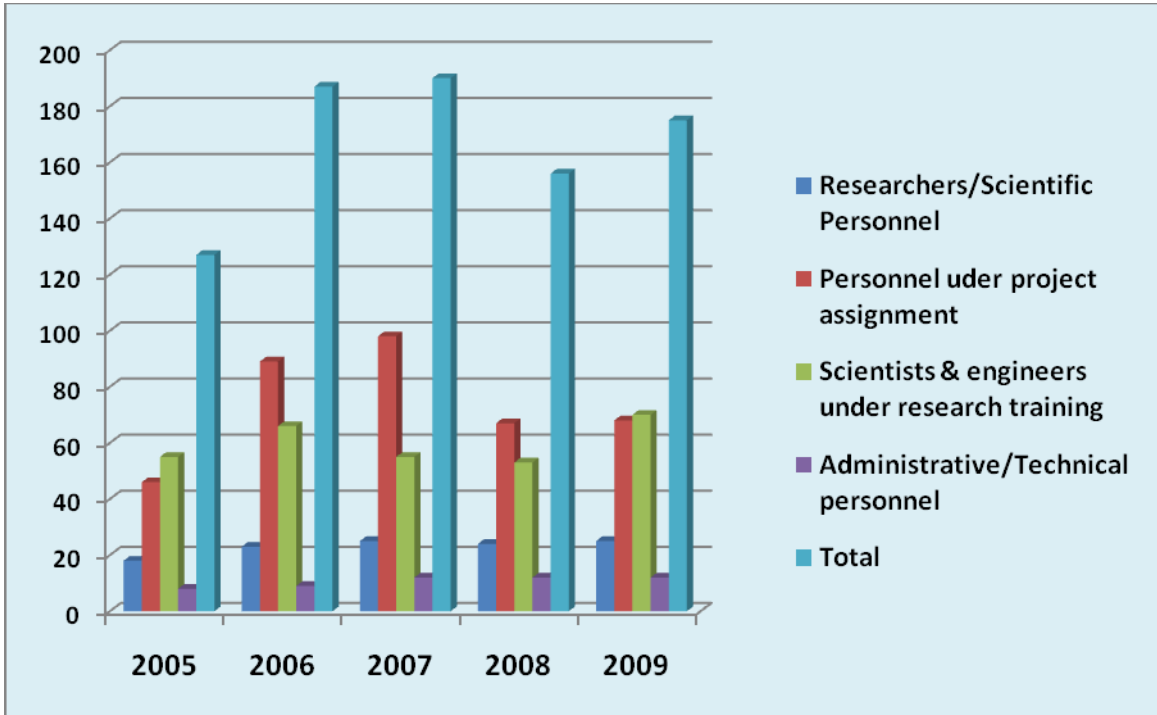


Fund raising comparison with the previous period





Staff distribution over the period



Concluding Remarks

During the 5 years period 2005-2009 the Institute of Informatics & Telecommunications of NCSR "D" had a dynamic development that can be summarized as follows:

- **Participated actively in the implementation of 46 competing national, European and International Research and Technology projects**, cooperating with companies, industries and other research organizations from the Greek, European and international arena.
- The **financing inflows** of the above projects and project services in the period 2005-2009 were **12.244.250 €**, representing the **63.3% of the total input of the Institute over 36.7% of the Regular Budget**.
- In **2009** started competing projects with a total budget for the NCSR «D» of **3.400.341,00 €**, while the **total budget of active projects reached 11.689.393,40 €**. Also in 2009 approved for funding 3 new projects, which will start in 2010 with a budget of **1.183.132,00 €**.
- **The Publications** of Researchers in magazines, books and conference proceedings in this **5 years period are more than 500, while identified about 2800 new citations** by other researchers in papers published by the Institute researchers.
- The Institute's researchers were also highly mobile in the organization and participation in national and international conferences. It is worth mentioning the successful organization and fulfillment of the international conferences, IFIP TC-6 Networking '04, the ICGI'04, UM-2007 ECAI2008, 3DOR'08, ESAW VIII, EAACL 2009, PETRA 2009, etc., in the areas of Networks and Artificial Intelligence. The Researchers make the Institute well recognized by their participation in editorial committees of 8 international scientific journals, many conferences scientific committees as well as in reviewing publishable work for numerous journals, conferences and evaluation of research projects.
- Researchers have organized or/and participated in international scientific competitions with very good results (SHREC 2006, TRECVID 2006 and DISCOVERY CHALLENGE 2006).
- **The Institute of Informatics & Telecommunications of NCSR "D" under the Gov. publication number 640/t.V '/ 23-5-06** involved in the postgraduate study program of the University of Athens together with the Institute of Biomedical Research, of the Athens Academy School and the Department of Medical Instruments Technology of the Technological Educational Institute of Athens, entitled "Computer Applications in Bio-medicine"
- In 2008 it has started an international cooperation program, for joint development of doctoral research, with the Univ. of Texas at Arlington, USA and the Univ. of Loughborough, England. Moreover, the Institute's researchers had also participated actively in training new researchers, in teaching undergraduate and postgraduate courses in various Universities & Technological Educational Institutes of the country. This had resulted in the

fulfillment of many undergraduate, postgraduate and doctoral theses, as well as the practical training of young researchers in competing projects.

- The year **2004** was a landmark in the chronicle of IIT by **creating the first spin-off company of the Institute** for the commercialization of research results under the Law 2119/2001. (www.i-sieve.com). Today, **i-sieve** employs 8 people with a turnover of more than 260.000 Euro, of which more than 80% turned up from international market sales.
- The Institute has also been very active in the promotion and diffusion of generated technology and knowledge, participating in exhibitions, international competitions, with publications and interviews in the media and also providing advisory services to many organizations and companies. Of particular interest was the participation of the Institute Director in the **“Road Show” of NCSR “D” in the region of Washington, USA**, March 2008.
- In 2009 the **Prize for good practice of “IKY: State Scholarships Foundation”** was awarded to the Laboratory of Computational Intelligence for its involvement in the project **E-Medi** "Virtual school on Medical and E-learning Framework"
- In the reported 5 years period, the institute researchers had awarded 4 patents, while 2 more patents are under evaluation
- As a full member of the W3C International Agency for the development of the Internet the Institute has had a significant contribution to the creation of the Protocol **POWDER (Protocol for Web Description Resources)**. The POWDER defines the way to describe a set of web sources (e.g. websites, documents, images, multimedia content) using meta-data, which can read and edited by electronic devices such as computers or mobile phones. POWDER creates the basis for building a **"web of trust»**, where the user receives the desired for him content while avoiding unnecessary or dangerous information.
- Since **2009** the Institute participates in international standardization bodies of ETSI and IEEE 1900.4

In 2009 the 5-years business plan, which started in 2005, was successfully completed and a new version is expected, which will build on existing experience and infrastructure and will be based on a more dynamic development model of the Institute and its research teams.

PS: The attached leaflet presents briefly the European FP7 projects



NCSR "DEMOKRITOS"
INSTITUTE OF INFORMATICS & TELECOMMUNICATIONS



IIT PARTICIPATION IN FP7 PROJECTS

Having gained significant international recognition and based on a critical mass of high-quality research staff, the Institute of Informatics and Telecommunications is continuously strengthening its contribution to cutting-edge research in Greece, Europe and internationally. Based on its long-term plan the research effort in European projects is along the following directions:

- making sense and extracting knowledge from multimedia (image, video, audio, text),
- making the interaction of people with machines more natural and personalized,
- investigating for better B3G networks technologies that support ubiquitous and transparent access from anywhere and at any time,
- investigating advanced technologies for smart antennas, and
- making robust technologies that support location based services.

Progress towards these ambitious goals will bring citizens and businesses closer to the valuable knowledge that is currently hidden in the vast amounts of content available in digital form, no matter the place they might be located or the digital machine they use.

This leaflet presents briefly the FP7 projects we have been involved till April 2010.

IMPACT – Improving Access to Text

Can we turn mass amounts of digital documents into searchable text?

<http://www.impact-project.eu/>



The IMPACT project brings together fifteen national and regional libraries, research institutions and commercial suppliers - all centres of competence with unequalled experience of large-scale text digitisation processes and technologies. The project will let them share their know-how and best practices, develop innovative tools to enhance the capabilities of Optical Character Recognition engines and the accessibility of digitised text and lay down the foundations for the mass-digitisation programmes that will take place over the next decade. This project will facilitate a more collaborative approach to mass-digitisation. It will build capacity and lower the barriers to entry for organisations in the early stages of their own digitisation activity.

CASAM - Computer-Aided Semantic Annotation of Multimedia

Can we help users to add knowledge to multimedia?

<http://www.casam-project.eu/>



CASAM will facilitate the synergy of human and machine intelligence to significantly speed up the task of human-produced semantic annotation of multimedia content. The project will aggregate human and machine knowledge with the ultimate target of minimizing human involvement in the annotation procedure. Intelligent human-computer interaction is of central importance, and the concept of effort-optimized knowledge aggregation will be introduced. This is the task of reaching high-quality annotations by requiring the least effort from the user. CASAM will provide a significant boost to the long term goal of achieving really large-scale and precise annotation of multimedia documents with minimum human effort. Semantic annotation will in turn make images, video, audio and text easier to search and retrieve.

PASCAL 2 - Pattern Analysis, Statistical Modeling and Computational Learning

How far can we get by combining machine learning, statistics and optimization?

<http://www.pascal-network.org/>



PASCAL is a Network of Excellence funded by the European Union. It has established a distributed institute that brings together researchers and students across Europe, and is now reaching out to countries all over the world. PASCAL is developing the expertise and scientific results that will help create new technologies such as intelligent interfaces and adaptive cognitive systems. To achieve this, it supports and encourages collaboration between experts in Machine Learning, Statistics and Optimization. It also promotes the use of machine learning in many relevant application domains.

SERVIVE - Service Oriented Intelligent Value Adding Network for Clothing-SMEs embarking in Mass-Customisation

Can we achieve personal style advice and interactive garment configuration?

<http://www.servive.eu/>



By bringing together all the key players of the garment production process (designers, industry, customers), SERVIVE aims at the mass customization and personalization of the process. The core of the system is a component that models the preferences and characteristics of the customer (e.g. biometrics, age, etc.), based on a generic personalization server (PServer) that is provided by NCSR "Demokritos". Personalization uses customer types, which evolve over time, through the analysis of data collected from the users.

PRONTO - Event Recognition for Intelligent Resource Management

Can we detect interesting events to support decision makers in dynamic settings?

<http://www.ict-pronto.org/>



PRONTO will offer real-time, knowledge-led support for decision-makers in sectors characterised by large volumes of multi-source, multi-format data. The project introduces a highly synergetic approach to intelligent resource management by extracting information from sensor data, audio and text, and recognising important events that are taking place. This approach is applicable to a wide range of domains, where resource management is needed, and the PRONTO technology will be tested in two such domains: emergency rescue operations, such as flood incidents, and city transport management, e.g. passenger comfort in trams and busses.

SYNC3 - Synergetic Content Creation and Communication

Can we link user-generated content (blogs) to running news events?

<http://www.sync3.eu/>



SYNC3 will provide an intelligent framework for making more accessible the vast quantity of user comments on news issues. The project will structure the part of the blogosphere that refers to running news stories, rendering it accessible, manageable and re-usable. The immediate target of SYNC3 is the news industry and social networks, but domains like commerce, tourism, e-science and business intelligence are likely to benefit from the linking of blog comments with current entities, such as events that appear in the news.

AVISPIRE - Audio-VISual Speech Processing for Interaction in Realistic Environments

Can we make more sense of what people say by reading their lips?

AVISPIRE will work towards expanding the state-of-the-art in the topic of audio-visual speech processing from today's "toy" examples to realistic human-computer interaction in difficult, realistic environments like the classroom, the automobile, multimedia streams of broadcasted news, and during meetings in smart rooms. Work will focus on both robust extraction of visual speech information, as well as its efficient fusion with the acoustic modality.

DITSEF - Digital & Innovative Technologies for Security & Efficiency of First responder operations



Can we help First Responders to act more safely and efficiently?

<http://www.ditsef.eu>

DITSEF aims at increasing the effectiveness and safety of First Responders by optimal information gathering and sharing with their higher command levels. DITSEF will provide

- Self-organising, robust ad-hoc communications where the existing infrastructure may be compromised, allowing communication between First Responders and between them and their command level
- Accurate novel 3D positioning in indoor environments
- Sensors that offer a reliable overview of the situation and of the potential threats (explosives, chemicals, fire, etc.).
- Enhanced vision for the First Responder in visually-impaired conditions, through ingenious and unprecedented HMIs consisting of sensor-based visual elements, showing spatial features and thermal imagery overlaid on the direct perception of the First Responder.

HMFM Hear Me, Feel Me

Can we support visually impaired elderly daily routine?

<http://ttuki.vtt.fi/hmfm/index.html>



The HMFM project deals with the chronic condition of vision impairment. Different degrees of vision impairments are inevitable results of growing old, as the physiology of our eyes changes with time when the eye tissues lose their flexibility and suffer from damages caused by everyday life, different health conditions (such as diabetes or blood pressure) and gravity.

The possibilities to prevent vision impairment with technology are very limited, but there are promising possibilities to support the visually impaired elderly in better managing their everyday lives with the help of modern information and communication technology.

HMFM explores the possibilities for improving the quality of life by providing mobile service access for the visually impaired elderly using services related to (a) medication and medicine related information and services, and (b) health monitoring and diet information.

OPTI-TRANS Optimised Transport System for Mobile Location-Based Services

How can we exploit innovative technologies in order to optimize the use of public and private transportation?

<http://www.optitrans-fp7.eu>



The OPTI-TRANS project aims to create a Mobile GNSS platform which will provide commuters/travellers with the ability to plan their trip in an efficient manner in order to utilise and share a combination of public/private transportation by combining information from various public transport authorities and other private vehicle owners. It will display to the commuters the optimum router/transport combinations for their trips, based on their location.

OPTI-TRANS will interface with existing database systems providing public transport information (timetables, routes, etc.) to give the most optimal multi-model solutions for the commuters' requirements. It will incorporate Transport-on-Demand (ToD) through the Car Pooling services and Passenger-on-the-Curb facilities that allow privately owned vehicles to be shared with others subscribed to the service.

The OPTI-TRANS system will not only provide the means to investigate the feasibility of a dynamically updated, location-aware pedestrian and public transport navigation tool, but will offer these services as an

end product. This will be made possible by the development of both the OPTI-TRANS platform and the OPTI-TRANS GNSS-enabled mobile application.

TASS Total Airport Security System

How can we use innovative technologies in order improve airport security monitoring?



No SITE yet

TASS is a multi-segment, multi-level intelligence and surveillance system, aimed at creating an entire airport security monitoring solution providing real-time accurate situational awareness to airport authorities. The TASS concept is based on integrating different types of selected real time sensors & sub-systems for data collection in a variety of modes, including fixed and mobile, all suitable for operation under any environmental conditions.

TASS divides the airport security into six security control segments (environmental, cargo, people, airplanes, vehicle-fleet & facilities) each of them being monitoring by various technologies that are fused together, creating a multisource labyrinth fusion logic enabling situational and security awareness of the airport anytime and anywhere.

The TASS consortium consists of 3 main end users representing 16 airports and 16 technological partners, which bring together European SME's, industrial and academic partners, ranging from sensor design and electronic communications through to civil airport protection. The technologies will be tested at 3 airports including the hub airport Heathrow, an Israeli domestic airport and Athens airport, in order to cover a wide range of needs at different levels of airport protection. The main test at Heathrow airport will involve scenarios including 2 connected to the upcoming 2012 Olympic Games in London ultimately resulting in a high & smooth passengers flow.

HURRICANE - Handovers for Ubiquitous and optimal bRoadband connectIvity among CooperAtive Networking Environments

Achieving improved broadband wireless communications through joint Exploitation of wireless access technologies

www.ict-hurricane.eu



As a result of recent technological outburst, a multitude of wireless telecommunications systems are currently available, including 2G and 3G mobile networks, wireless Local Area Networks (e.g., WiFi), wireless Metropolitan Area Networks (WiMax) and digital TV broadcasting systems (DVB-x). All these technologies can be used for broadband network access. Moreover, most terminals commonly employed for such access (mobile phones, laptops, palmtops, etc) provide nowadays the capability of operating in multiple networks. Thus, the joint exploitation of alternative wireless networks covering a given user's location emerges as an important way towards improved and more flexible telecommunications services. This joint exploitation fundamentally relies on the "vertical handover" operation, which is the process of dynamically 'moving' from one wireless network to another during a call (or Internet access session, or service reception), in a non-intrusive way. HURRICANE investigates technical problems that must be resolved towards enabling optimal vertical handovers. The technologies developed by the project deal with the multitude of wireless networks in a unified way, so that the vertical handover support system that will result as an outcome of the project will be compatible with all such networks, including emerging ones. In the course of the project activities, NCSR "Demokritos" participates in relevant international standardization committees.

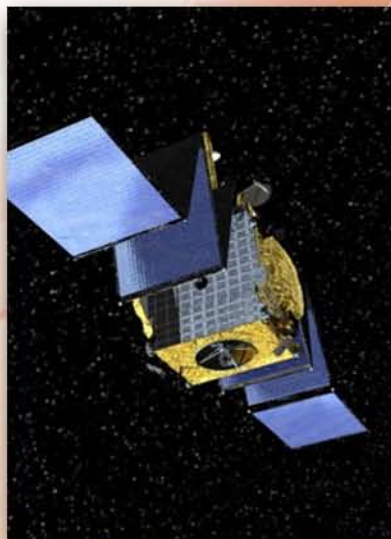
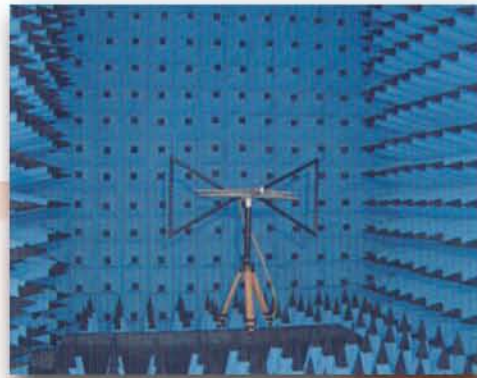
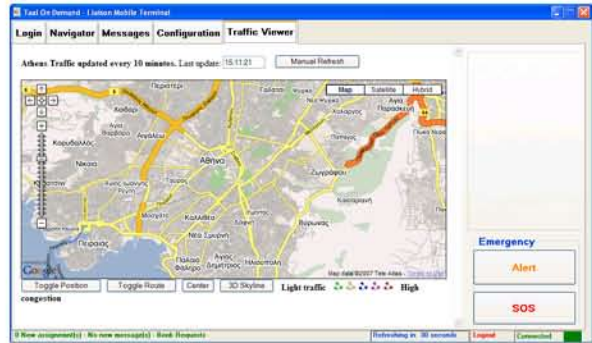


The predominant candidate for the current trend of multimedia services convergence with mobile/fixed networks and broadcast-interactive applications is the IP Multimedia Subsystem (IMS). IMS entails novel business opportunities for pioneering and emerging multimedia services, such as IPTV and VoIP video call applications.

However, this strong commercial interest on this promising convergent IMS environment is balanced by the lack of efficient user/customer-centric network management mechanisms.

ADAMANTIUM proposes an IMS-compatible Multimedia Content Management System (MCMS) focused on performing dynamic cross layer adaptations for optimization of the user experience in terms of perceptual quality for IPTV and VoIP services. The MCMS in the proposed ADAMANTIUM architecture acts as the orchestrator element on enhancing users Perceived QoS (PQoS) by applying in an integrated and coherent way adaptation actions along all the network layers and nodes of the media-delivery chain, based on a user/customer-centric approach rather than a typical engineering one. In this framework, the MCMS utilizes advanced machine learning decision algorithms, considering various constraints in the decision process, such as the content characteristics, the network condition and the encoding type, aiming at the optimization of the user satisfaction.

An intermediate version of the ADAMANTIUM MCMS is currently implemented and demonstrated on an actual IMS platform installed over a UMTS access network, where VoIP-based and IPTV services are provided.



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