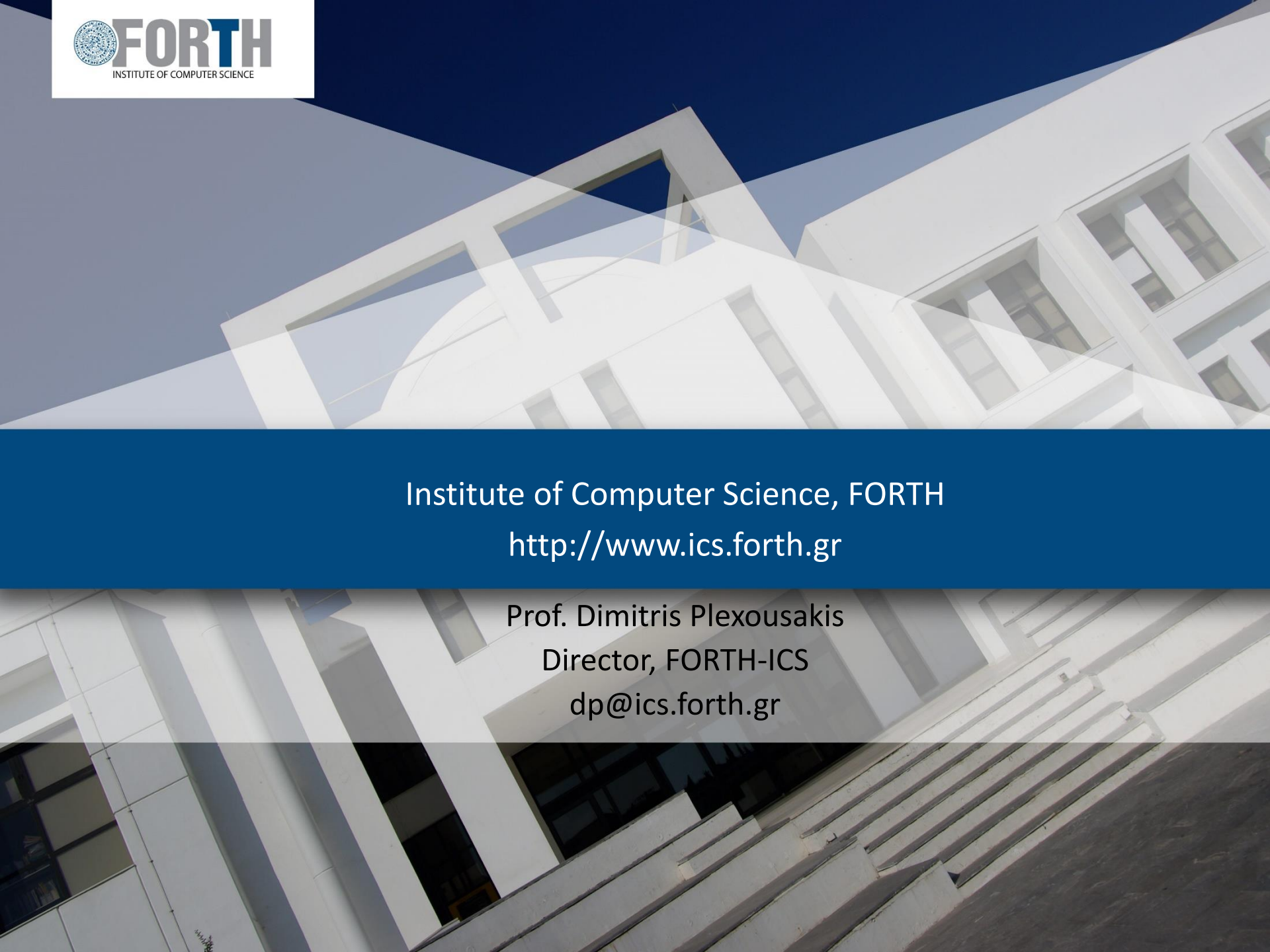


Institute of Computer Science, FORTH

http://www.ics.forth.gr

Prof. Dimitris Plexousakis
Director, FORTH-ICS
dp@ics.forth.gr

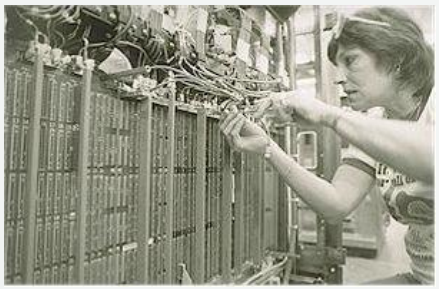
ICS Mission

To perform high quality basic and applied research, to promote education and training, and to contribute to the development of the Information Society, at a regional, national, and European level

Pioneering the Internet in Greece

July 1984

The first connection of Greece to the Internet



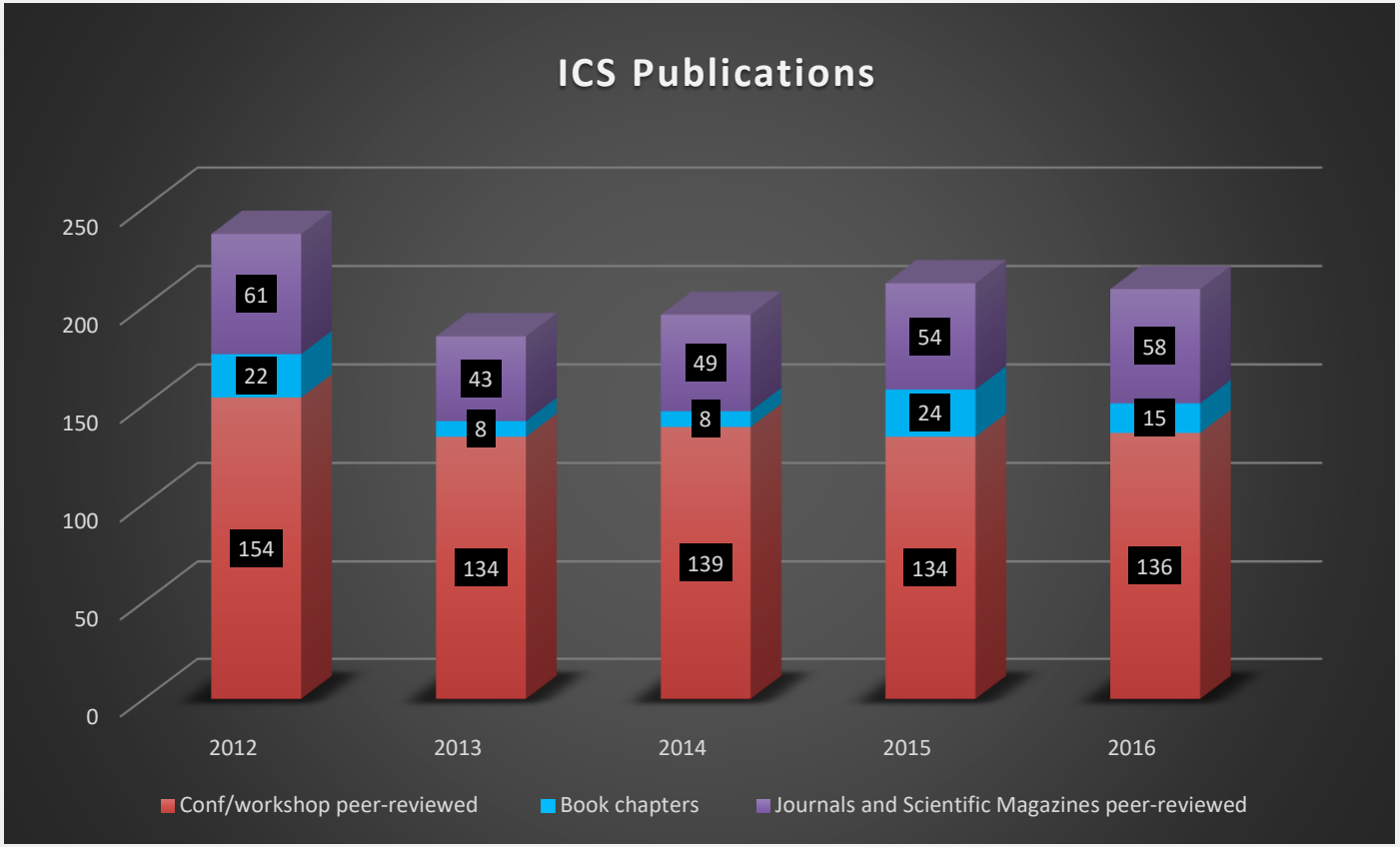
Scientific Excellence

ICS-FORTH has excelled in all evaluations of Greek Research Institutes conducted by GSRT: always ranked first in the Computer Science domain
- most recent evaluation in February 2014

Performance in H2020:

- 52 funded projects (1 ERC Starting grant – NETVOLUTION)
- Funding: 20,205,785 euros

Impact


ICS Publications
250
200
150
100
50
0
61
22
154
43
8
134
49
8
139
54
24
134
58
15
136
2012
2013
2014
2015
2016
Conf/workshop peer-reviewed
Book chapters
Journals and Scientific Magazines peer-reviewed

Impact

Deployment of R&D results in various sectors

- Health, culture, education, tourism, quality of life, entertainment, etc.

Research infrastructures

- Ambient Intelligence and Smart Environments Facility
- Contributions to several European, national and regional (research) infrastructures

Commercial exploitation of research results in various domains

License agreements with industry

Spin-off companies

- FORTHnet, OvidVR
- Several spin-offs based on cutting edge technologies have recently been founded and others are currently under development

>30 Patents

Organizational Structure

Research Laboratories

- Computer Architecture and VLSI Systems
- Distributed Computing Systems and Cybersecurity
- Telecommunications and Networks
- Information Systems
  - Center for Cultural Informatics
- Human - Computer Interaction
- Signal Processing
- Computational Vision and Robotics
- Computational BioMedicine
  - eHealth Applications and Services

R&D Programmes

- Ambient Intelligence
- Data Science
- Advanced Hybrid Imaging Systems

Service Provision Departments

- Systems and Networks
  - FORTHcert
- [.gr] Domain Registry

Administrative and Functional Departments

- W3C Greek Office
- ERCIM Office

Certified managerial structures and practices
ISO 9001, 27001

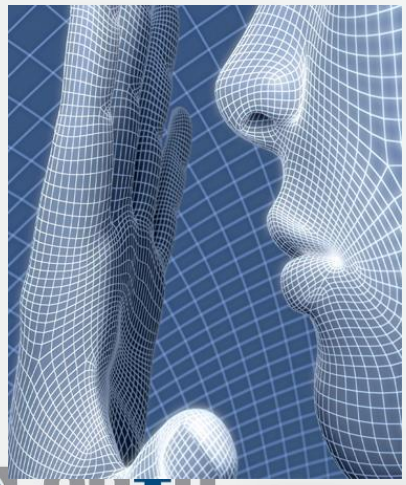
Staff

September 2017

Category	Number
Researchers / research scientists	18
Collaborating Faculty	26
Postdoctoral Associates	12
Postgraduate Research Assistants	70
Undergraduate Trainees	36
Permanent Admin / Technical Staff	65
Limited Term Contracts	121
Other fellows (Marie Curie, postdoc, postgrad)	45
Total	393

Inter-disciplinary Research Directions

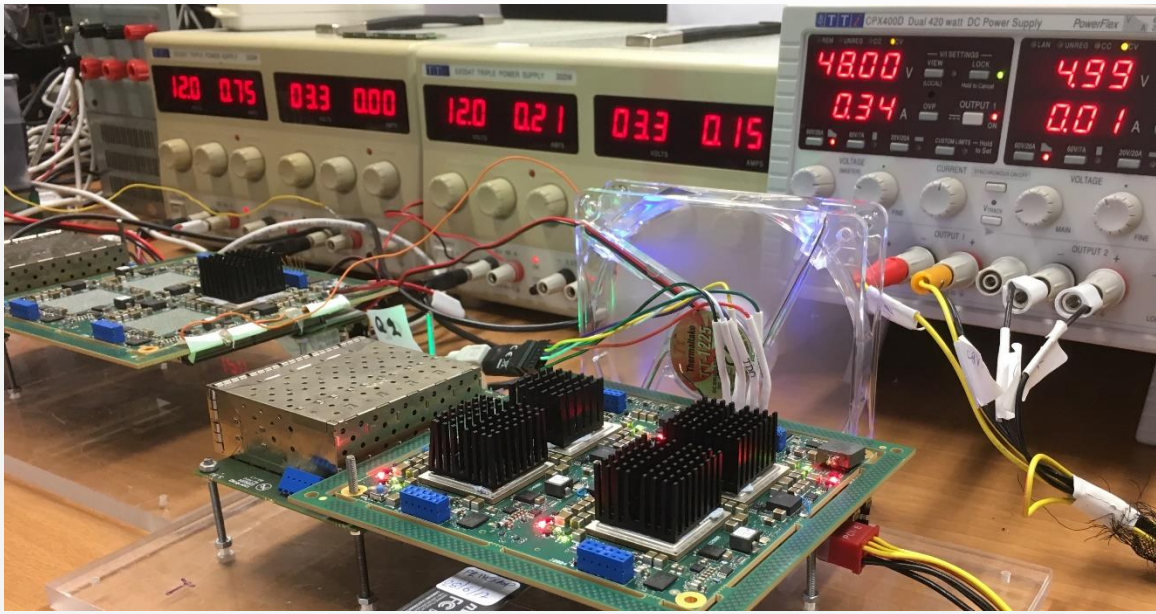
- Ambient Intelligence
- Quality of Life Technologies
- ICT for Cultural Heritage and Creativity
- Big Data Management and Analysis
- Social / Cognitive Robotics
- Advanced Hybrid Imaging Systems



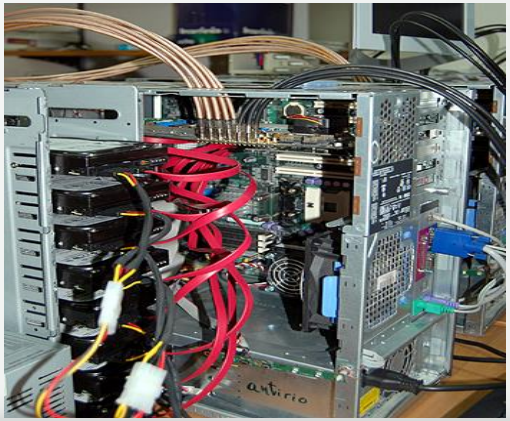
Research Highlights

Computer Architecture & VLSI Systems (CARV) Lab

- Scalable Architectures
- Fast Communication
- Storage & I/O
- Systems Software
- Parallel Programming
- Distributed Systems Theory
- *Designing the "European Processor"*



Exascale Supercomputing: ExaNest, ExaNode, EuroEXA



Research Highlights

Distributed Computing Systems and Cybersecurity (DiSC) Lab

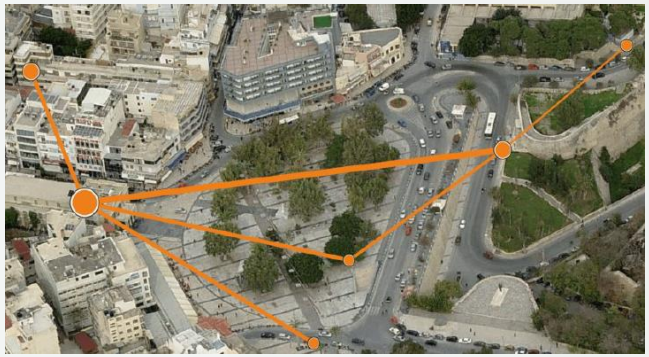
- Authentication and Authorization:
- Critical infrastructure security
- Crypto currencies (Bitcoin):
- Embedded systems security, End-to-end security, security by design
- Hardware (assisted) security
- Intrusion Detection Systems
- International collaboration on promoting security and privacy
- IoT Security, Mobile security
- Safer Internet for kids
- Social Media analytics
- Threat intelligence and operational security
- Trust and Certificates
- Programmable meta-surfaces

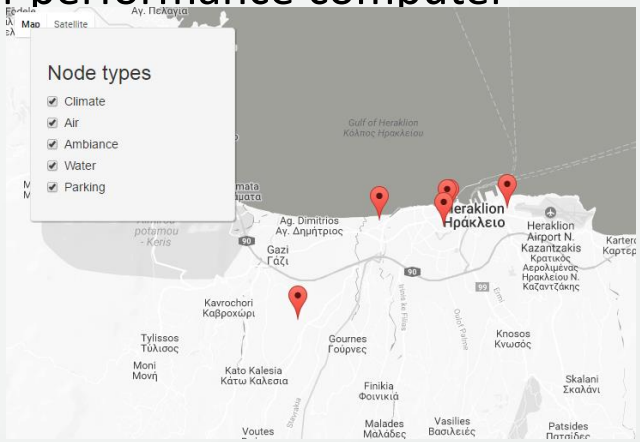
SaferInternet4Kids.gr
ΓΙΑ ΕΝΑ ΑΣΦΑΛΕΣΤΕΡΟ ΔΙΑΔΙΚΤΥΟ

Research Highlights

Telecommunications and Networks (TNL) Lab

- Internet-of-Things to Smart Cities
  - RERUM: A secure by-design IoT Architecture (Heraklion & Tarragona)
  - Heraklion Smart City: expanding, enriching and enhancing the IoT architecture of our city
- 5G Networks
  - WiVi-2020: Exploiting heterogeneous Radio Access Technologies & Software Defined Radios/Networks – Application Defined Networking.
- Software Defined Networks
  - NetVolution: Building more resilient, secure, and high-performance computer networks using new SDN technologies
- Collection and analysis of Internet measurements
  - In-depth understanding of Internet behavior
- Monitoring, Analysis & Recommendation Systems
  - Competitive Internet services
  - Better Smart Cities

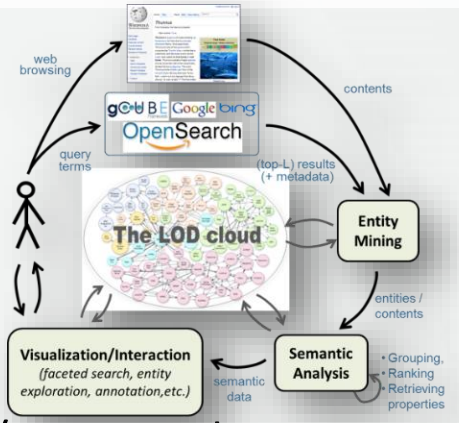


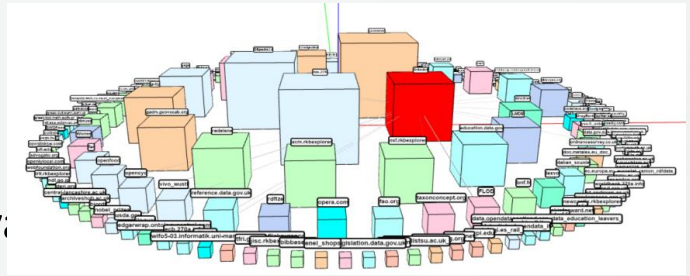


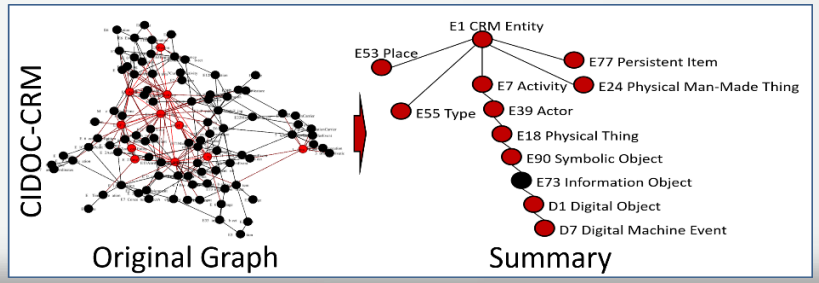
Research Highlights

Information Systems (ISL) Lab

- Knowledge Representation and Reasoning
  - Knowledge Evolution, Belief Revision
  - Reasoning in Dynamic, Uncertain Environments
  - Argumentation Systems
  - Ontology Engineering
- Data and Knowledge Base Systems
  - Big Data Management and Analysis (Data Science)
  - (Linked) Data on the Web – Semantic Data Management / Large Scale Semantic Integration
  - Distribution, Scalability, Benchmarking
  - Information provenance
- Information Retrieval
  - Preference-enriched Exploratory Search for v
    dialogue systems
- Service-Oriented Architectures
  - Service management / monitoring
  - Cloud computing systems
  - Model-driven multi-cloud applications







Research Highlights

Center for Cultural Informatics (CCI)

- **Comprehensive study and support of cultural-historical and scientific research processes**
- **Ontology engineering** for **global semantic interoperability**

CIDOC CRM

- Targeted development **of industrial-quality information systems** posing **scientific challenges** in **real settings**
- **Promotion of standards** and consultancy for integrated information management of cultural / scientific records
  - ✓ Leadership in Standardization Efforts: **CIDOC Conceptual Reference Model ISO 21127 Standard)**
- Participation in **European Research Infrastructures**
  - ✓ Digital Humanities / Cultural Heritage
  - ✓ Biodiversity
  - ✓ E-science

Research Highlights

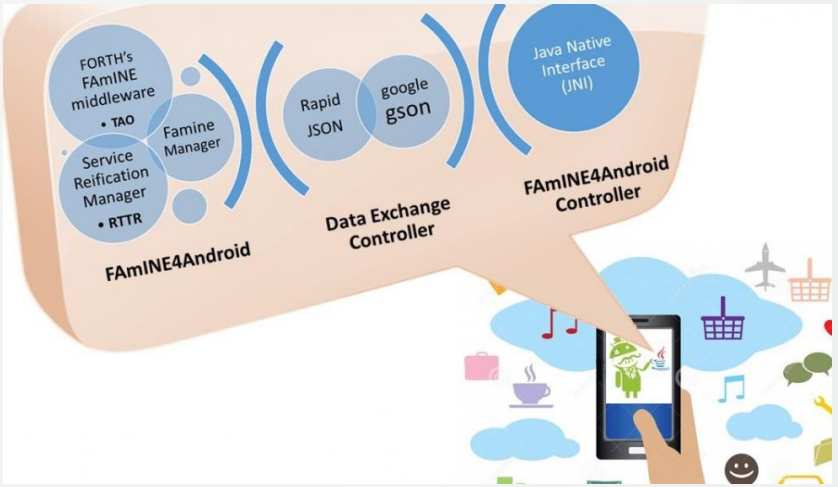
Human-Computer Interaction (HCI) Lab

- Augmented and Mixed reality Systems
- Novel Interaction techniques in intelligent environments
- IoT objects and furniture
- Intelligent games and applications for children
- Human-robot interaction applications
- Ambient Assisted Living and Quality of life technologies
- Innovative public services

Research Highlights

Ambient Intelligence Programme (AMI)

- Interoperating embedded devices of different sizes and capabilities, interweaved into “the fabric of everyday life”
- Vision: improve the quality of life through the creation and provision of safe, efficient and user-friendly technologies, catering to the needs of each and every individual in a seamless, unobtrusive and invisible way
- Application Domains: Arts & Culture, Tourism, Commerce & Advertising, Education & Learning, Wellbeing and Healthcare, Domestic and Working Life, Leisure & Entertainment, Agriculture, etc

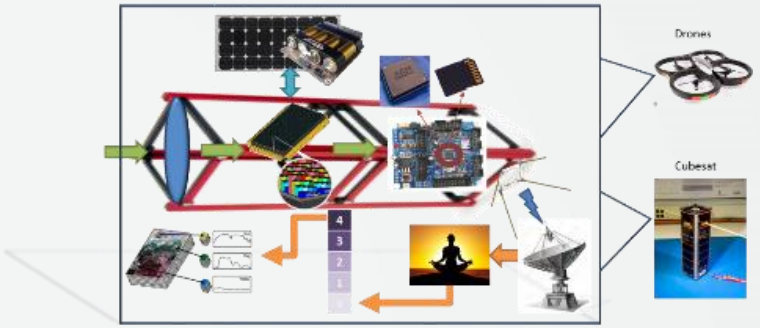


Middleware

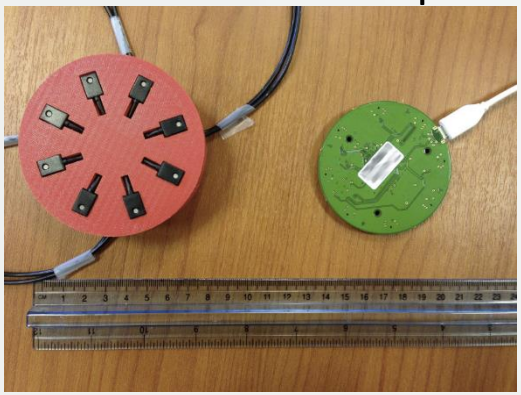
Research Highlights

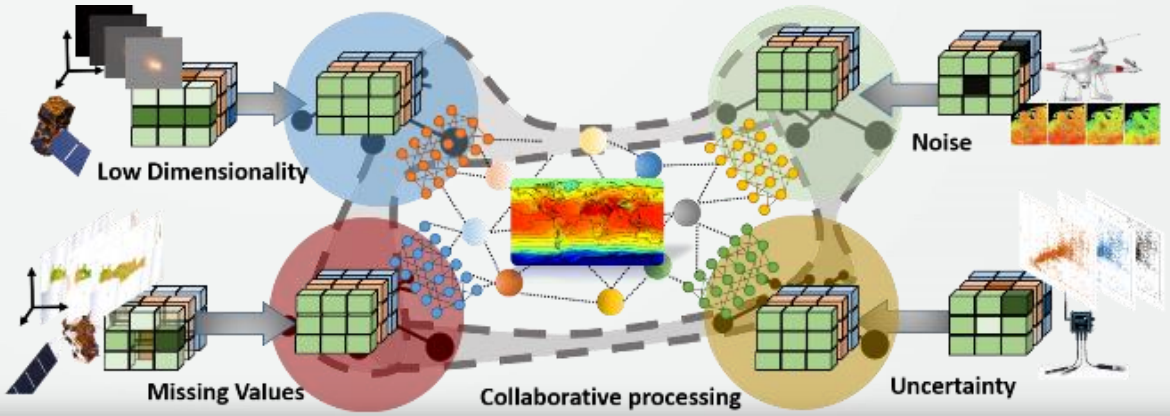
Signal Processing (SPL) Lab

- Computational Sensing
  - Combination of processing & learning
  - Development of miniaturized platforms
  - Applications in signal/image domain



- Analysis of Big Sensor Data
  - Astrophysical data modeling via large-scale learning systems
  - Snapshot Spectral Imaging for Earth Observations
- Audio Signal Processing using microphone arrays
  - Sound localization and directional enhancement; far-field speech recognition
  - Immersive reproduction based on directional analysis

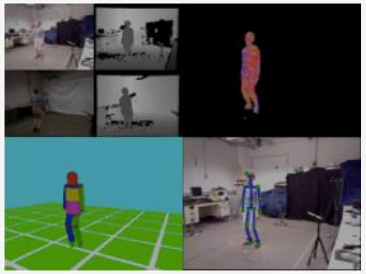


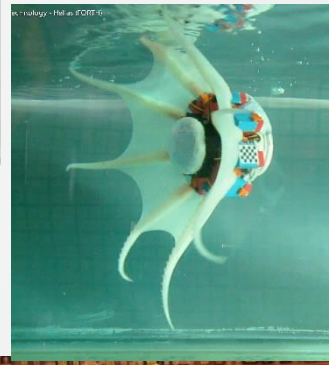


Research Highlights

Computational Vision and Robotics (CVRL) Lab

- Autonomous robots with human-robot interaction capabilities
- 3D tracking of hands and hand-object interactions
- 3D tracking of humans
- AR rendering and animation
- Bio-robotic crawling on sand and multi-arm underwater swimming
- Brain-inspired cognitive robotics
- Visual Perception
- Virtual and Augmented Realities
- Bio-inspired Robotic Locomotion and Control
- Robot Cognition and Learning





Research Highlights

Computational Bio-Medicine (CBML) Lab

- Mission: develop novel ICT technologies in the wider context of predictive, personalized, preventive and participatory (the P4) medicine
- Personalized Medicine
  - Clinicogenomic data interoperability and integration
  - Multi-modality Imaging: Positron Emission Tomography (PET)-Computed Tomography (CT)-Magnetic Resonance Imaging (MRI)
- Personal Health Systems
  - Innovative personalized health services
  - Empowerment of individuals
  - Disease prevention, chronic disease management
- Computational Neuroscience
  - Brain signal analysis
- Bioinformatics
  - Translational bioinformatics (pathways analysis, pharmacogenomics)
  - Understanding complex human evolution

Research Highlights

Center for E-Health Applications (CeHA)

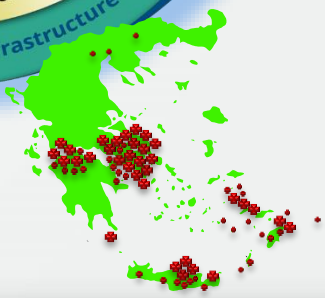
- Implementation of the **1st** Integrated Regional Health Telematics Network in Greece (HYGEIAnet)
- Implementation of **4** Integrated Regional Health Information Systems in Greece since 2005
- **Consultation services and technical support**

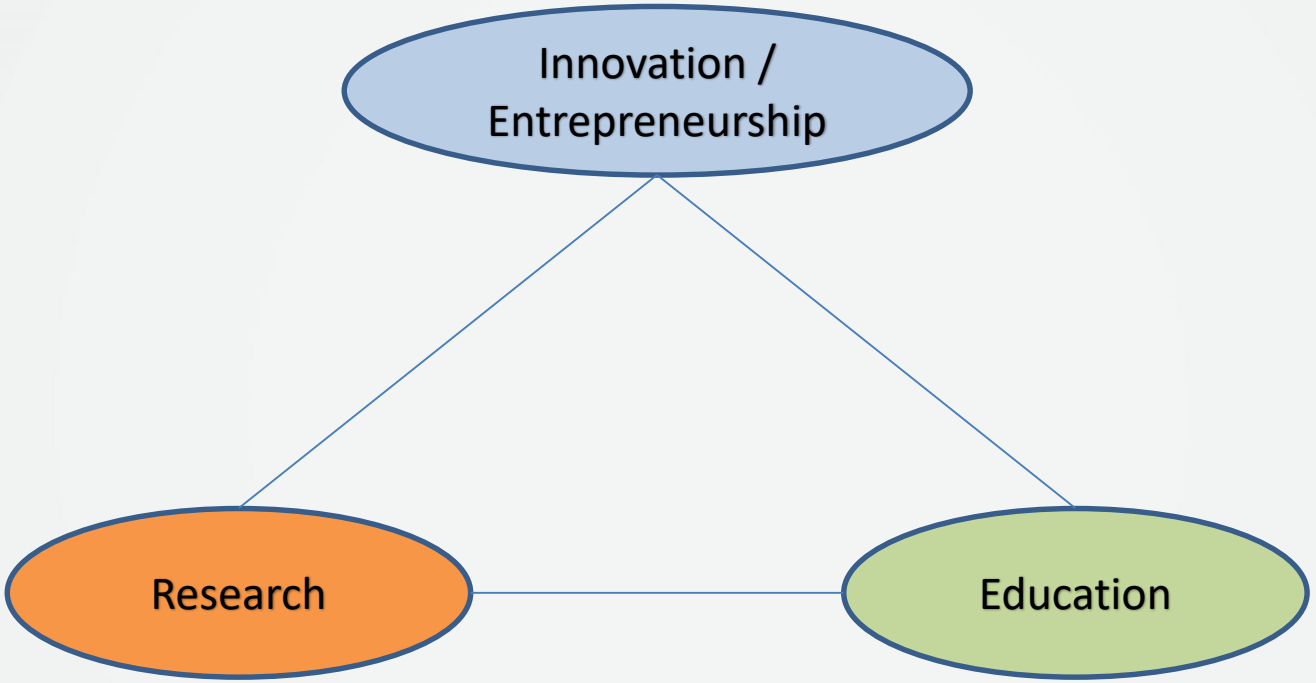
to more than **60 health care units** of the NHS

- Implementation of more than **250** projects

in healthcare units of the NHS over the last five years

- **Development of** more than **100 specialized tools to support Integrated Care Solutions**
- **Information security management system**, in line with ISO 27001:2013





Thank you for your attention!