

The Institute of Computer Science -FORTH



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Institutes of FORTH



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Institute of Applied & Computational Mathematics, Heraklion

Institute of Electronic Structure & Lasers, Heraklion

Institute of Molecular Biology & Biotechnology, Heraklion

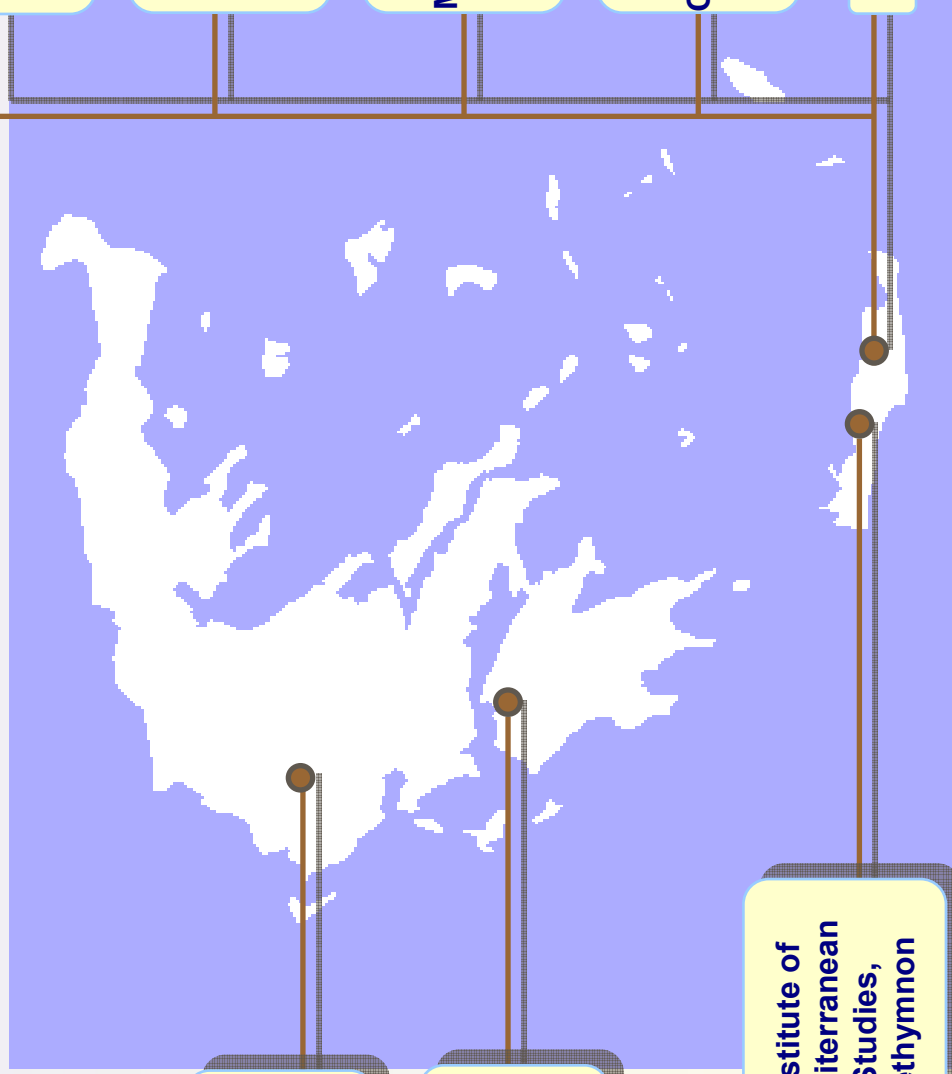
Institute of Computer Science, Heraklion

Crete University Press

Institute of Biomedical Research, Ioannina

Institute of Chemical Engineering, Patras

Institute of Mediterranean Studies, Rethymon





History

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- ◆ **1983, May**
 - ✦ RCC starts operating with three research institutes: IMBB, IESL & ICS, associated with the University of Crete.
- ◆ **1985, June**
 - ✦ Two new institutes were added: IACM & IMS.
- ◆ **1987, November**
 - ✦ Two new institutes ICE/HT & CPERI joined with the RCC to form FORTH which is administratively independent from Universities and one of the largest research centers in Greece.
- ◆ **2000, March**
 - ✦ CPERI was detached from FORTH.
- ◆ **2002, January**
 - ✦ BRI was added to FORTH.



ICS – Mission and Objectives

ICS - FORTH

- ◆ Basic and Applied Research
- ◆ Development of Applications
- ◆ Development of Prototype Systems
- ◆ Provision of Services to the Public and Private Sectors
- ◆ Exploitation of R&D results
- ◆ Education and training

Organizational Structure of ICS



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Research and Development Laboratories

- Center for Medical Informatics and Health Telematics Applications
- Computational Vision and Robotics Laboratory
- Human-Computer Interaction Laboratory
 - Centre for Universal Access and Assistive Technologies
- Information Systems Laboratory
 - Center for Cultural Informatics
- Computer Architecture and VLSI Systems Laboratory
- Telecommunications and Networks Laboratory
- Distributed Systems Laboratory
- Bioinformatics Laboratory (joint with IMBB)

Other Departments

- FORTHnet Research and Development
- Department of Internet Domain Names Administration for [.gr]
- Department of Education and Training
- Department of Systems and Networks Administration



Personnel (2003)

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◆ Researchers	9
◆ University Faculty	19
◆ Associated Researchers	11
◆ Technical Personnel	103
◆ Administrative & Auxiliary Personnel	10
◆ Graduate Research Assistants	60
◆ Trainees	49
◆ Total	261



Research and development efforts

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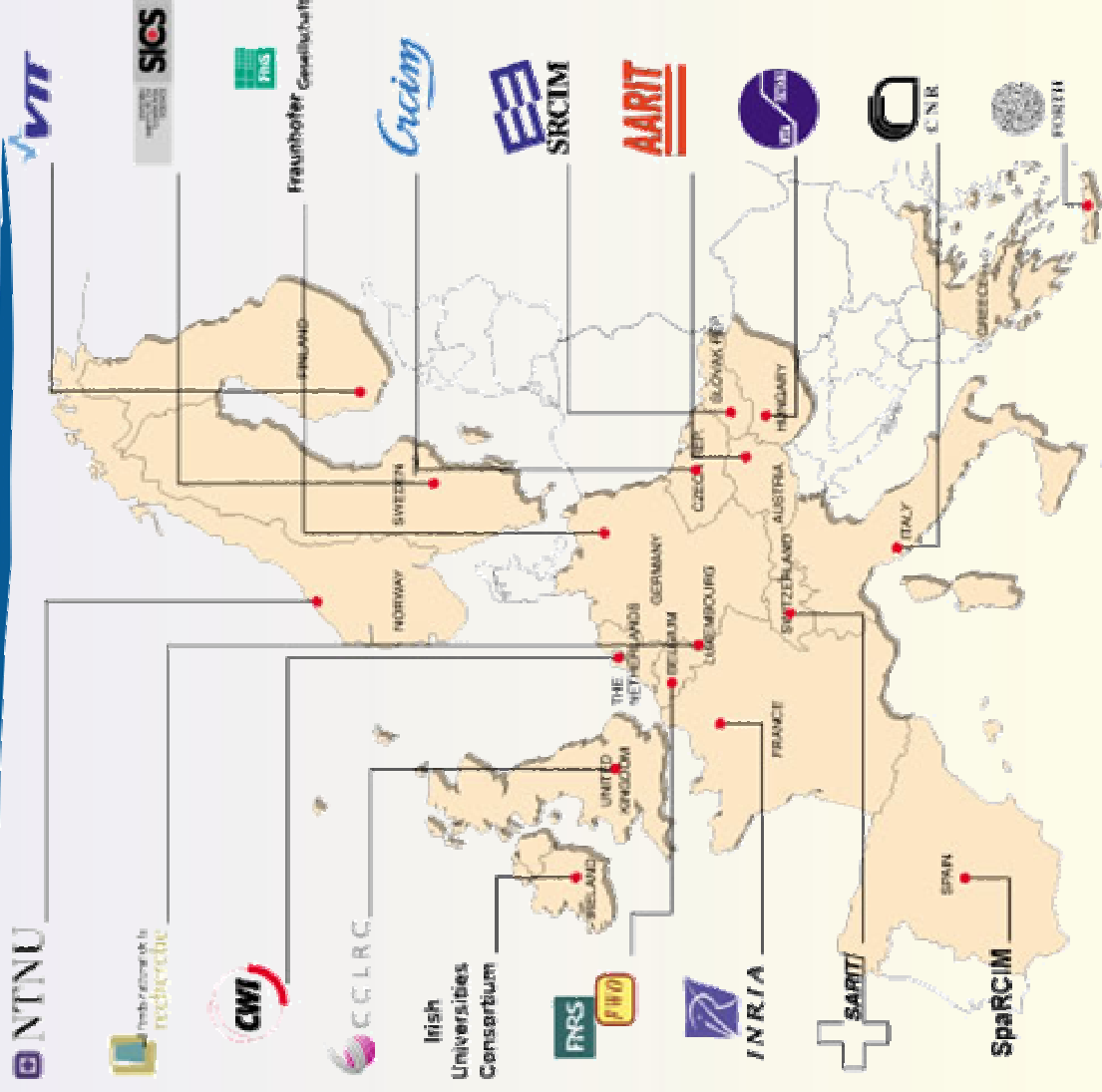
- ◆ **Areas of ongoing research**
 - ✦ information systems
 - ✦ data and knowledge-based systems
 - ✦ information retrieval
 - ✦ image processing and pattern recognition
 - ✦ computer vision
 - ✦ sensor technologies
 - ✦ Robotics
 - ✦ machine learning
 - ✦ digital communications
 - ✦ network management
 - ✦ computer architectures
 - ◆ VLSI design
 - ◆ computer aided design
 - ◆ human-computer interaction
 - ◆ virtual reality
 - ◆ universal access and usability
 - ◆ information and communication technologies in Healthcare
 - ◆ assistive technologies
- **New areas of research**
 - ✦ bio-informatics
 - ✦ Web systems and technologies
 - ✦ embedded systems
 - ✦ GRID and large-scale computing

Membership in ERCIM

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ERCIM is a consortium of leading research institutions from 18 European countries, committed to the advancement of information technology and applied mathematics

ERCIM is emerging as a de facto network of excellence and “distributed think tank” contributing to the formation of research policies at the European and international levels





Advanced Computing Systems Lab

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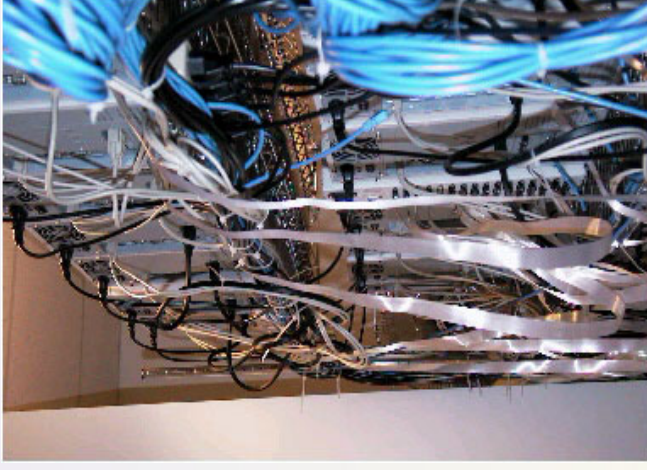
- ◆ Personnel
 - ✦ 3 faculty members
 - ✦ 3 staff members
 - ✦ 15 students
- ◆ Research Areas: Computing Systems
 - ✦ Internet/Web Systems and Technologies
 - ✦ GRID and peer-to-peer systems
 - ✦ Internet Security
 - ✦ Storage Systems
 - ✦ Embedded Systems

Computer Systems: The very big and the very small



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- ◆ Current activities
 - ✦ Scalable storage systems
 - ✦ Runtime systems for miniature devices and sensors
- ◆ Objectives
 - ✦ back-end computing & storage infrastructures for e-society
 - ✦ Enable miniature devices in novel areas, e.g. security and biomedical



GRID Computing and Peer-to-peer Systems



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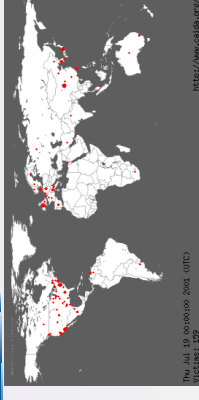
- ◆ Current GRID-related Research includes:
 - ✦ System architecture: peer-to-peer vs. hierarchical systems
 - ✦ Large-scale Storage Systems for GRIDs
 - ✦ Performance management for GRIDs: monitoring, caching, replication
- ◆ Objectives
 - ✦ to play an active role in the European Computing GRID Initiative in collaboration with leading European Organizations
 - ◆ Participation in EGEE, COREGRID, and HellasGRID projects
 - ✦ investigate the impact of GRID on other sciences
 - ◆ e.g. Health Sciences



Internet Security and Safety

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- ◆ Current Research/Dissemination Activities
 - ✦ Intrusion Detection Systems
 - ✦ Intrusion Prevention Systems
 - ✦ Use of Network Processors for security and monitoring of high-capacity networks
 - ✦ Automatic Detection of new Cyberattacks (zero-day worms)
 - ◆ Early-warning system for early detection and response to cyberattacks before they manage to spread all over the globe
 - ✦ Protection of Privacy in the presence of network monitoring
 - ✦ FORTH is Leader of LOBSTER, an SSA for the development of
 - ◆ a European Internet Monitoring Infrastructure



◆ Objectives

- ✦ Establish a state-of-the art Research Team in Security III collaboration with leading European and US Research Institutions
- ✦ Lead and Participate in core National, European, and International projects
 - ◆ Current participation in SCAMPI, LOBSTER, EAR, SecSpeer, NETWATCH, SAFELINE, i-GUARD





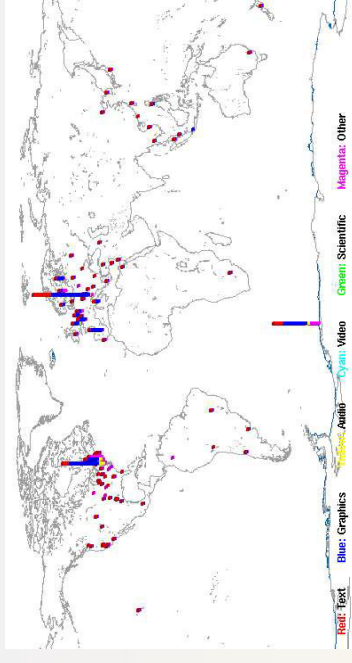
Web Systems and Technologies

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◆ The World Wide Web has evolved from a file sharing facility to the world's largest information, entertainment, and business medium

◆ Activities

- ✦ Web Systems and Technologies
 - ◆ Health Telematics (Hygeianet)
 - ◆ Device Independence access
 - ✦ to lightweight devices (mobiles, PDAs)
 - ◆ Web Performance
 - ◆ Web Measurement and Monitoring
 - ◆ Web portals
 - ◆ Web searching, Information discovery
- ✦ Host of W3C Office in Greece
 - ◆ attracted two new members in 2003 (ITY, AIT)
- ✦ Participation in the W3C Web Accessibility Initiative
- ✦ Contribution towards the realisation of the Semantic Web, through the development of the RDF Suite





Conclusion

- ◆ ICS aims to maintain and enhance its current position as a Center of Excellence in key areas of basic and applied research, through
 - ✦ state-of-the-art research
 - ✦ wider international cooperation
 - ✦ creation of successful spin-off companies
 - ✦ formation of strategic alliances with industry at a national and international level
 - ✦ a strategic role in the development of the Information Society

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Application domains

- ◆ Regional information society networks
- ◆ e-Health, e-Culture, e-Accessibility, e-Learning, e-Tourism, e-Commerce, e-Government
- ◆ Autonomous robotic systems
- ◆ WWW applications
- ◆ On-line communities
- ◆ Digital libraries
- ◆ Environmental applications
- ◆ Resource management
- ◆ Electronic design automation
- ◆ Wireless, wired and mobile telecommunications
- ◆ High-performance networks infrastructure and services
- ◆ Virtual and augmented reality systems
- ◆ e-Inclusion



Selected outcomes

- ◆ FORTHnet
- ◆ The HYGEIAnet integrated Health Telematics network of Crete
- ◆ The multi-sensor robotic platforms TALOS and LEFKOS
- ◆ The robotic wheelchair ODIGOS
- ◆ The single-chip ATM switch ATLAS I
- ◆ The Unified User Interface Development (U2ID) environment
- ◆ The AVANTI Internet browser supporting universal access
- ◆ The POLEMON National Monuments Record system
- ◆ The MAISTOR structural documentation system for buildings
- ◆ The ARXON document classification system
- ◆ The THETIS environmental and geographical information and visualization system



- ◆ The World Wide Web Consortium
 - ✦ an international organization with members around the world, contributing to the specification, guidelines, software, and tools for the development of the web
- ◆ The W3C Greek Office
 - ✦ can constitute a horizontal activity for the exploitation of the best research results in the area of web technologies, as well as collaboration with other interested organizations at national, European and international level



International Cooperation

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- ◆ ICS-FORTH cooperates, in the context of European or international collaborative R&D programmes, with universities, research centres and other organisations at national and international level, thus establishing a continuous exchange of scientific ideas and technology transfer
- ◆ Examples:
 - ✦ ERCIM (European Research Consortium for Informatics and Mathematics)
 - ✦ The PLANET Network of Excellence in AI Planning
 - ✦ OntoWeb Thematic Network for Ontology-based information exchange
 - ✦ The International Scientific Forum "Towards an Information Society for All" (ISF-IS4ALL, 1997-2000) and the Thematic Network (Working Group) "Information Society for All" IS4ALL (IST-1999-14101)
 - ✦ Participation as National Contact Centre of the "European Design for All e-Accessibility Network (EDeAN)"