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Each year when I write the foreword for the ERCIM Annual Report it provides the opportunity to review activities, celebrate successes, enthuse about new initiatives and look confidently to the future. I hope you enjoy reading this report and from it obtain some insight, ideas or stimulation.

The new initiatives taken in 2008, such as the external Advisory Committee and Innovation activities, have all been consolidated. As well as our new initiatives ERCIM has continued to develop within its previous strategic objectives. As usual researchers from ERCIM member institutions have been involved heavily in advice to the European Commission and national funding organisations on strategy in Information and Communications Technologies (ICT) and in Applied Mathematics (AM). The strategic relationship with the European Mathematical Society continues and the strategic relationship with ETSI, the European Telecommunications Standards Institute, flourishes with the preparations for the next edition of the ‘Infinity Initiative’ seminar for December 2010, building on the success of the second ‘Infinity Initiative’ seminar in 2009. ERCIM continues as the European host of the World Wide Web Consortium (W3C) and strategic discussions about the future structure of W3C initiated by ERCIM have borne fruit with a more efficient new hosting contract signed recently. The European W3C staff members continue to push forward the W3C objectives making a great contribution to the success of the Web. Advice and assistance in Web technology continues to be provided to industry and academia via the national W3C Offices, many of which are hosted by ERCIM members.

ERCIM continues into 2010 with 20 members following our expansion from 18 in the last two years. ERCIM thus continues to expand coverage of Europe and bring more ICT and Applied Mathematics R&D from ERCIM member institutions and partners into the ERCIM cooperative R&D environment.

ERCIM has continued to manage EC-funded projects although increasing competition in the 7th Framework calls resulted in ERCIM managing fewer new projects in 2009 than previously. However, ERCIM members continue to be successful in attracting research funding and there are healthy programmes in all member institutions.

The ERCIM Working Groups (WGs) continue to prosper and have been reviewed by the external Advisory Committee. A ‘Future Web’ Working Group is in process of formation to provide a platform for new R&D proposals in this highly relevant area. This is done in relation with the Web Science Research Initiative and the newly-formed Web Science Trust, both related to the Web Foundation.

The ‘Alain Bensoussan’ Fellowship Programme continues to prosper and is educating to high standard the future postdoctorate researchers in ICT for Europe and – indeed – beyond. In 2009 we increased the programme to 42 starters and 63 fellows hosted.

The 2009 CBA winner – among a very strong field of candidates – maintained the excellent young researcher standard. Teemu Roos not only had done outstanding research in information theory and related fields with a very impressive citation count, but has seen his results taken up and used widely.

The profile of ERCIM has been raised with appearances at conferences and workshops and sponsorship of various events. ERCIM News continues as a flagship representative of ERCIM.

In 2009 we celebrated the 20th anniversary of ERCIM with a special event in Paris, kindly co-hosted by INRIA, our French ERCIM member. This is reported in some detail within this report. We now look forward to the next 20 years.

It remains only for me to acknowledge all those who make ERCIM what it is. The Advisory Committee with its outstanding membership provides excellent advice and oversight. My three vice-presidents, each with an area of strategic responsibility and each assisted by a task group of Directors, ensure strategic direction. The members of the BoD each conduct the ERCIM mission in their country. The Executive Committee led by its experienced chairman has continued to ensure strategy is executed. The task groups of this committee control the smooth running of ERCIM activities and interact strongly with the ERCIM Office where - led by our ERCIM Manager - our staff members work tirelessly. Chaired by our chief editor, the Editorial Board continues to ensure the excellence, relevance and outreach of ERCIM News. However it is the Working Groups, and the researchers from ERCIM member institutions and associated academic and industrial partners participating therein, who are the ‘engine room’ of ERCIM. It continues to be an honour to lead this organisation.

Keith Jeffery

Keith Jeffery, Director IT and International Strategy of the Science and Technology Facilities Council at Rutherford Appleton Laboratory, United Kingdom, President of ERCIM
ERCIM – the European Research Consortium for Informatics and Mathematics – aims to foster collaborative work within the European research community and to increase cooperation with European industry. The members of ERCIM include leading research establishments from twenty European countries. Encompassing over 12 000 researchers and engineers, ERCIM is able to undertake consultancy, development and educational projects on any subject related to its field of activity. ERCIM was founded in 1989 and is a European Economic Interest Grouping (EEIG).

Objectives
ERCIM’s aim is to play a leading role in Information and Communication Technology in Europe by:
• building a Europe-wide, open network of centres of excellence in Information and Communication Technology (ICT) and Applied Mathematics. One member institute per European country serves as a node for the research community in its country
• excelling in research and acting as a bridge for applications
• being internationally recognised both as a major representative organisation in its field and as a portal giving access to all relevant ICT research groups in Europe
• acting as an interface for the non-EU member institutions within the European Community and other international organisations
• liaising with other international organisations in its field
• promoting cooperation in research, technology transfer, innovation and training.

International Cooperation
ERCIM considers it a high priority to develop cooperation with scientists all over the world. ERCIM hosts the European branch of the World Wide Web Consortium (W3C) and participates in EU activities and projects, and has established a partnership with ETSI, the European Telecommunications Standards Institute. ERCIM has participated in a European-Commission-funded initiative with India to foster cooperation between institutes and companies in these regions. ERCIM has also established cooperation with the European Mathematical Society.

Consultancy
ERCIM experts have been involved in many advisory bodies, such as the "Next Generation Grid expert group" (NGG3) and the Cloud Computing Expert Group convened by the European Commission, an expert group on “Software Evolution and Maintenance”, and the Information Society Technologies Programme Advisory Group (ISTAG). This group has been set up to advise the Commission on the overall strategy to be followed in carrying out the IST thematic priority and related activities of research as well as on the orientations with respect to the European Research Area. With the EU-funded coordination action ‘Interlink’, ERCIM has contributed to the identification of strategic areas and grand science and technology challenges related to ICT. Additionally, ERCIM senior researchers are participating in several EC-funded roadmapping projects as partners, invited participants or members of advisory boards.

Members
A member institute must be a leading research establishment in its country, with excellent links to both the national and international, academic and commercial research communities. ERCIM has one member institute per country. All ERCIM members are national centres of excellence, independent of specific commercial ties. They have a strong involvement in the research programs of the European Union and joint projects with both small and medium-sized enterprises and large industrial companies.
**Research Projects**  
In addition to many projects involving a few ERCIM institutes, ERCIM is itself participating in several European-Commission-related activities and projects as coordinator or partner. In these projects, several member institutes carry out the research while the ERCIM Office takes care of administrative and financial tasks.

**Working Groups**  
Working Groups are specialist networks set up by researchers, within which the ERCIM partners arrange regular workshops with invited external participation to study a specific topic and prepare international research projects. Working Groups are also the focus of the ERCIM fellowship programme. In 2009, a new Working Groups have been created in the areas “Models and Logics for Quantitative Analysis” and “Social Network Analysis”.

**Innovation**  
In addition to research in computer science and mathematics, innovation and transfer of research results is one of the ERCIM institutes’ current main assignments. In recent years, ERCIM members have played a pioneering role in creating small and medium-sized high-tech companies, an effective way of achieving such a transfer. In addition, ERCIM members have a long track record of cooperation with European industry in R&D projects, generally within the framework of European programmes. As a network, ERCIM can help industrial partners to locate the best scientific teams in Europe for a given domain.

**Sponsorship and Awards**  
Each year, ERCIM presents a promising young researcher in computer science and applied mathematics with the €5000 Cor Baayen Award. ERCIM also sponsors conferences, workshops and summer schools.

**Publications**  
ERCIM publishes the quarterly magazine ‘ERCIM News’, the ‘ERCIM Innovation’ magazine, workshop proceedings and policy documents.

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ERCIM Representatives (as of April 2010)
ERCIM has the legal form of a European Economic Interest Grouping (EEIG).

**Board of Directors**
In the Board of Directors, each member of ERCIM is represented by one of its executive directors or a nominee of its choice. The board represents the interests of the members within ERCIM and defines the general policy. The board elects the President and Vice Presidents for chosen strategic areas, currently Structure, External Relations, Innovation, and appoints the Manager and the Executive Committee Chairman.

**Advisory Committee**
An external Advisory Committee, formed in 2008, advises the President and hence the Board of Directors on strategic directions but also evaluates the ERCIM Working Groups and gives recommendations for selecting the Cor Baayen Award winner. The current membership is:

**Executive Committee**
The Executive Committee is composed of one representative per member institution. The committee implements and monitors ERCIM’s objectives and activities. It acts as the principal forum in which the members liaise through their representatives with the ERCIM President, the ERCIM Manager and each other.

**ERCIM Office**
ERCIM is maintaining an office in Sophia Antipolis, France, co-located with the European branch of the World Wide Web Consortium (W3C), headed by the ERCIM Manager Jérôme Chailloux. The ERCIM Office is managing the day-to-day business of ERCIM. The ERCIM Manager is the valid representative of ERCIM vis-à-vis third parties. He is responsible for ensuring that the implementation of ERCIM’s general policy is within the framework specified by the membership.

**ERCIM Office in Brussels**
ERCIM maintains an office in Brussels to strengthen its links with European Commission key players. The new office is located within the premises of our Italian member CNR, right in the centre of the European quarter. ERCIM is thus able to offer a hosting environment for ERCIM staff and ERCIM project meetings in Brussels. The office is headed by Pierre Guisset.

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Throughout 2009 ERCIM traded as ERCIM EEIG with a gross turnover of 26 million €. Half of these funds came from EU funding of projects which was either disbursed to partners in consortia or held over for disbursement in the next year. The remaining sources of income and activities consuming expenditure are outlined below.

**Non-disbursed income 2009**
- W3C membership fees and sponsorship: 31%
- EC contract management: 14%
- ERCIM member contributions: 5%

**Non-disbursed expenditure 2009**
- ERCIM administrative costs: 25%
- W3C European host costs: 22%
- EC contract management: 26%
- ERCIM Fellowship Programme: 21%
- W3C host & offices funds: 5%
- ERCIM communications activities: 2%
ERCIM hosts the European headquarters of the World Wide Web Consortium (W3C). ERCIM and W3C aim to strengthen research relationships throughout Europe to better support the development of Web technology and to jointly share the results of their collaboration.

Six of the nine existing European W3C Offices have been based at ERCIM institutes, including CWI (Benelux); FORTH (Greece); SZTAKI (Hungary); CNR (Italy); SICS (Sweden) and STFC (UK and Ireland).

W3C Offices in Europe work with their regional Web communities to promote W3C technology in local languages, broaden W3C's geographical base, and encourage international participation in W3C activities. Specifically, the W3C Offices help organize meetings and workshops (on topics such as semantic Web, Web Services and the mobile Web).

As a consortium of members from many European countries, ERCIM creates a balance between European diversity and necessary homogeneity by building bridges between different cultures and facilitating the movement of technical ideas within academia and across borders. W3C is very heavily swayed by its members, several of them having interests in the Web (such as HTML5, mobile Web, social Web, eGovernment, etc.) whereas ERCIM jointly has widespread interest in many research fields where Web standards are rarely used. ERCIM then helps to gather those Web communities and make them work together.

Moreover, ERCIM members have strong ties with industrial partners and start-up companies. This is an excellent opportunity for W3C to enlarge its cooperation with European industry, which can broaden its participation in the making of standards.

Finally, hosting the W3C is beneficial to ERCIM and its members. It allows ERCIM to benefit from the know-how and expertise of the W3C team, and to increase its visibility based on W3C's worldwide reputation.

The joint efforts of ERCIM and the W3C have started to increase Web research cooperation in Europe. The considerable payoffs, perspectives and growing synergies bode well for the future of this fruitful cooperation.

The number of European Members is of 142 (from a total of 329).

The W3C Team includes xx 63 people working from locations across the globe, with xx 19 being employed by ERCIM (all figures for 31 December 2009).

**Main Results and New Initiatives in 2009**

**W3C Widgets for Web Applications**

Interest, activity and progress around W3C widgets has increased significantly in 2009, especially in the mobile community. Widgets are interactive applications created using Web technologies (HTML, CSS, ECMAScript) packaged in a way to allow a single download and installation on a user’s machine, mobile or other devices.
About the World Wide Web Consortium

The World Wide Web Consortium (W3C) is an international consortium within which member organisations, a full-time staff and the public work together to develop Web standards. W3C's mission is: "To lead the World Wide Web to its full potential by developing protocols and guidelines that ensure long-term growth for the Web."

W3C develops Web Standards and Guidelines
W3C primarily pursues its mission through the creation of Web standards and guidelines. In its first ten years, W3C published more than ninety such W3C recommendations. W3C also engages in education and outreach, develops software, and serves as an open forum for discussion about the Web. In order for the Web to reach its full potential, the most fundamental Web technologies must be compatible with one another and allow any hardware and software used to access the Web to work together. W3C refers to this goal as ‘Web interoperability’. By publishing open (non-proprietary) standards for Web languages and protocols, W3C seeks to avoid market fragmentation and thus Web fragmentation.

W3C is an International Consortium
Organisations located all over the world and involved in many different fields join W3C to participate in a vendor-neutral forum for the creation of Web standards. W3C Members and a dedicated full-time staff of technical experts have earned W3C international recognition for their contributions to the Web.

W3C Members, staff and invited experts work together to design technology that ensures that the Web will continue to thrive in the future, accommodating a growing diversity of people, hardware and software. W3C's global initiatives also include nurturing liaisons with over forty national, regional and international organisations around the globe. W3C operations are jointly administered by the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) in the USA, ERCIM and Keio University in Japan.

W3C Members
Organisations join W3C to work and exchange ideas with more than 350 Members, including the world’s foremost technology companies, who come from more than forty countries and have a broad range of interests. W3C recently instituted a number of changes to its fee structure to encourage participation from organisations in developing countries as well as from EU-funded projects.

W3C Members take a leadership role in the future of the Web, promote their image as innovators participating in a standards body international in mission and impact, and gain early insight into market trends.

W3C Members include vendors of technology products and services, content providers, corporate users, research laboratories, standards bodies and governments, all of whom work to reach consensus on a direction for the Web. Adoption of W3C standards and the reliance of global commerce and information exchange upon W3C Web standards continue to grow. Members have a unique opportunity to participate directly in the revolution that is changing the way the world works and people live.

http://www.w3.org

Typical examples of widgets include clocks, games, weather forecasters, e-mail checkers and photo albums. With a number of competing widget approaches existing in the marketplace, W3C’s set of widget specifications is seen as an important effort to prevent fragmentation.

Training Mobile Web Developers
As more and more people reach the Web through mobile devices, W3C has sought to help Web designers and content producers familiar with the desktop world learn about the Web as delivered on mobile devices. MWI created a training course — "Introduction to Mobile Web Best Practices" — to provide information about the promises and challenges of the mobile platform, and offer guidance for using W3C’s Mobile Web Best Practice to design mobile-friendly Web content. Since its creation, nearly 450 developers have registered for the course, and feedback has been very positive.

High-Level and Grassroots eGovernment Efforts
In June 2009, the UK Prime Minister announced that Tim Berners-Lee would initiate a project to help put open linked data on the Web. Tim also met with senior technology officials regarding United States policy initiatives to improve government data transparency and availability. The eGovernment Interest Group's new charter reflects this focus, and in September the eGov IG published a first draft of Publishing Open Government Data.

Web of Data - Maturing Technology Stack
At the same time, the latest technologies of the Semantic Web stack (SKOS, SPARQL, POWDER, OWL 2, RIF) became W3C Recommendations or are nearly there. In September W3C announced the new RDB2RDF Working Group, which will help connect relational databases and the Web of data. Some new Incubator groups (Semantic Sensor Network, Provenance) suggest directions for future additions to the technology stack.

Social Web
Given that social networking is one of the most popular applications on the mobile Web, the Mobile Web Initiative organized, in January 2009, a Workshop on the Future of Social Networking. It attracted nearly 100 participants and 72 position papers.
ERCIM Celebrated
20th Anniversary

ERCIM and INRIA organised ERCIM's 20th anniversary celebration in conjunction with the ERCIM Spring Days meetings in Paris on 28 May 2009. The anniversary was marked by a seminar including presentations by renowned personalities from research and industry, and representatives from the ERCIM community.

Set in the heart of the historical Le Marais district, 'Les Jardins du Marais' was the venue not only for the celebration, but also for the ERCIM Board of Directors and Editorial Board meetings, several ERCIM Working Group meetings and two European project meetings, namely InterLink and EuroIndia. In all, 180 attendees participated in ten meetings over three days.

Anniversary Seminar
The highlight of the anniversary celebration was the seminar held on the afternoon of 28 May. It was organised into three sessions: 'Science and Society', 'ERCIM Activities' and a 'historical round table'. Following the welcome speeches by the ERCIM President, Keith Jeffery and President d'honneur, Cor Baayen (a founding father of ERCIM), Wendy Hall (University of Southampton) gave the first talk. As President of the Association for Computing Machinery (ACM), a position to which she was elected in July 2008 as the first person from outside North America, Hall presented plans to create a European chapter of the ACM. She then talked about the new discipline known as 'Web Science', the main concern of the Web Science Research Initiative that she recently founded together with Tim Berners-Lee, Nigel Shadbolt and Daniel J. Weitzner. The goals of Web Science are to promote and encourage multidisciplinary collaborative research, to study the development of the Web, to provide a global forum enabling academia, government and industry to understand the scientific, technical and social factors that drive the growth of the Web, and to encourage innovation.

Mazin Yousif (Avirtec Inc., CEO and former-Intel executive and chair of the ERCIM Advisory Committee) talked about 'green computing'. When looking at the worldwide energy consumption of data centres, for example, the importance of this topic is obvious. The energy consumption of all data centres worldwide is similar to the entire energy consumption of a country like Argentina or The Netherlands. Reducing energy consumption relies on four pillars: new technology (new materials, virtualisation of computing facilities etc), efficiency (energy-efficient equipment, minimising resources executing workload etc), conservation (energy caps, resource consolidation, certificates) and operations (advanced cooling technology, best practices, holding IT accountable for cost etc). This is an area in which ERCIM could take the lead, promoting green computing in Europe, encouraging the establishment of a Green Computing Working Group, drafting a green computing research vision, encouraging green computing initiatives, and working with European standardisation bodies and the EU to expand the code of conduct.

Gerard Berry (INRIA) delivered a remarkable speech about his personal experience of teaching computer science to school children. Unlike the current generation of teachers and scientists, children today grow up with technology forming a natural part of their life. These days, there is little emphasis on teaching children the concepts of how computers work. Yet getting today's children enthused about scientific subjects...
such as computer science is crucial to ensuring a good cohort of engineers and scientists tomorrow. As Berry pointed out, what we must do is educate children in such a way that they choose to develop from consumers into creators.

Philipp Hoschka (W3C) spoke about the work of the W3C (of which ERCIM is the European host) and progress towards the Ubiquitous Web. Ubiquitous computing is now at an inflection point, where both hardware and software offer solutions for applications. Recent examples include the 'Sekai Camera' that can display and create 'floating air tags' when a user is navigating through a museum, and 'SixthSense', developed by the MIT Medialab, a wearable gestural interface that augments the physical world with digital information and lets us use natural hand gestures to interact with that information. W3C is currently working in fields such as geolocation, camera API and widgets. More work is needed on model-based user interface design and device-to-device communication. Hoschka concluded that mobile Web applications will play an important role for ubiquitous computing and that they are a good opportunity for European research and industry to get involved.

Walter Weigel, Director General of ETSI, the European Telecommunications Standards Institute, gave a talk entitled ‘Standardisation of research results’. ERCIM and ETSI have developed a well-established cooperation, through five years of shared Grid technology experience, partnerships in European projects, and through the joint ‘Infinity Initiative’, a series of annual advanced seminars. Weigel explained the key challenges for successful innovation. With innovation cycles accelerating, market segmentation demands faster product and service takeoff and thus an increased investment in R&D. However, it is not sufficient simply to be innovative, or to master the innovation environment: the crucial question is how to ensure that an innovative advantage is not wasted. This is why work in standards is so important for transforming innovation leadership into market leadership. ‘First movers’ can set the standards and use them to impose their market leadership. Standardisation is also an important ‘market access tool’. As Weigel explained, if we look at standardisation as a business process, successful innovation then needs to manage the increasing overlaps in the research, test and development and product phases. A closer link is therefore needed between research and standardisation.

Opening the second session of the seminar, Alessandro Fantechi (University of Florence and ISTI-CNR) gave a presentation on the Formal Methods for Industrial Critical Systems (FMICS) Working Group as an example of an ERCIM success story. The Working Group was created in 1992 by Stefania Gnesi and Diego Latella (CNR), following an initial successful workshop in Pisa, Italy. Although model checking was then in its early days, the FMICS community was already aware of the great potential of formal verification techniques. Since then, the Working Group has advanced with the development of formal verification techniques and model checking in particular. The series of annual workshops, started in 1996, is now a well-established conference in the Formal Methods community. It has promoted an ongoing scientific discussion focused on identifying the most efficient verification techniques, with a keen eye on their industrial applicability. Most members of the FMICS community have strong links with industry; this has aided in the gradual introduction over the last decade of formal methods into the development cycle of industrial critical systems.

‘Beyond the Horizon’ (BTH) and INTERLINK are two examples of how ERCIM has affected EC strategy, and were presented by Dimitris Plexousakis (ICS-FORTH). BTH - Anticipating Future and Emerging Information Society Technologies, a project carried out in 2005-06, defined the major challenges and promising research directions in ICT-related strategic areas. Support for these was provided through a well-organised, extensive and systematic consultation of the relevant research community in Europe. The project was composed of six thematic groups investigating the topics ‘Pervasive Computing and Communications’, ‘Nanoelectronics and Nanotechnology’, ‘Security, Dependability and Trust’, ‘Bio-ICT Synergies’, ‘Intelligent and Cognitive Systems’ and ‘Software Intensive Systems’. The intended impact was to enhance
Europe's reactivity to emerging scientific and technological challenges, to build research communities and research networks in these fields, to encourage interdisciplinary research, and to increase industry's awareness of new trends, challenges and visions in information society technology-related research. As a result, a large majority of the proposals were adopted as proactive initiatives in the Future and Emerging Technologies Work Programme of the EU 7th Framework Programme.

INTERLINK - International Cooperation Activities - takes a similar approach. This project had several missions: to identify and address globally relevant basic research problems where significant added value is expected to be gained from worldwide cooperation; to establish communication and cooperation mechanisms within and beyond Europe to support the formation and functioning of a related scientific community; to identify complementarities in selected thematic areas among EU and non-EU countries that can give rise to knowledge and technology exchange; and to define joint basic research agendas, road-mapping activities and joint RTD initiatives. The thematic areas of INTERLINK are 'Software intensive systems and new computing paradigms', 'Ambient computing and communication environments', and 'Intelligent and cognitive systems'. The outcomes of project are comprehensive state-of-the-art reports and research roadmaps in the three thematic areas, as well as a number of new proposed research themes, including 'ensemble engineering' and 'socially-aware ambient intelligence'.

Both projects were carried out under the guidance of, and in collaboration with, the European Commission. As with the BTH project, it is expected that INTERLINK will have an impact on the European Commission's work programmes. It is also expected that the INTERLINK results will be noted by the research programs of the US Congress on Robotics and the Japanese Science Foundation on Cognitive Systems.

The session on ERCIM activities ended with presentations from Andreas Rauber (TU Vienna/AARIT) and Michal Haindl (Institute of Information Theory and Automation, Academy of Sciences of the Czech Republic/CRCIM), who reported on their personal experiences and views of the Cor Baayen Award and the ERCIM Fellowship Programme respectively. Andreas was the 2002 Cor Baayen award winner; Michal was one of the first three ERCIM fellows in 1990, and since then has hosted an ERCIM fellow himself. In a very diverting and personal manner, they demonstrated how these two ERCIM activities contribute to an increase in scientific reputation, scientific community building and the establishment of international contacts.

The seminar ended with a 'historical round table' composed of two former representatives of ERCIM's Board of Directors, and members of the Executive Committee and Editorial Board, namely Alain Bensoussan, Paul Williams, Bob Hopgood, Georges Nissen, Henk Nieland and Siegfried Münch. They explained how ERCIM began in 1989, discussed the early achievements and visions and answered questions from the audience.

The celebration continued into the evening with a gala dinner to which the participants were welcomed by Keith Jeffery and Michel Cosnard, President of INRIA. The dinner set the scene for speeches from former ERCIM presidents Gerard van Oortmerssen and Cor Baayen, presenting what they have contributed to ERCIM as presidents, what has been achieved during their term of office, and their recommendations for the future.

http://paris2009.ercim.eu
ERCIM has been participating either as coordinator or as a partner in sixteen European-Commission-funded research projects in 2009. Within these projects, ERCIM institutes and their partners carry out joint research activities, while the ERCIM Office carries out the administrative and financial coordination.

The main purpose of ERCIM is to foster cooperative work between its members while individual ERCIM member institutes also have their own R&D projects with international partners.

Ensuring the management of common research projects is a real asset, and this activity has become increasingly important for the ERCIM Office, which is now dedicating considerable effort to the administrative and financial coordination of European projects. Relying on an experienced team, the Office has a full range of expertise from the identification of funding opportunities to the development of project ideas, the finding of project partners, proposal writing, contract negotiation, project dissemination and project management. This is a key success factor, allowing research teams to focus on the scientific tasks at the core of each project.

Coordinating several projects, ERCIM has witnessed the emergence of a growing number of research initiatives involving strong interdisciplinary activities. If this has been a growing trend over the year, the European research projects now go a step further with the integration of advanced information and communication technology (ICT) to other domains.

The European Commission is now implementing its vision of the Information Society in which ICT is used to address real-life scenarios across a wide array of domains. This is also a significant way to ensure that European research will have a stronger impact on European citizens.
Life sciences are currently at the centre of an informational revolution. Dramatic changes are being registered as a consequence of the development of techniques and tools that allow the collection of biological information at an unprecedented level of detail and in extremely large quantities. Advanced technologies, such as high-throughput screening, genomics, proteomics and metabolomics, have resulted in data generation on a previously unknown scale.

The objective of ACGT (Advancing Clinico-Genomic clinical Trials on cancer: open grid services for improving medical knowledge discovery) is the development of a semantic grid infrastructure facilitating a common platform for researchers, clinicians, biostatisticians and software developers that will (i) facilitate seamless and secure access to heterogeneous, distributed multilevel databases; (ii) provide a range of semantically rich reusable, open tools for the analysis of such integrated, multilevel clinico-genomic data in the context of discovery-driven (eScience) workflows; (iii) support the creation and management of dynamic virtual organizations (VOs); and (iv) do so in full compliance with existing ethical and legal regulations.

The project is delivering a Master Ontology on Cancer and an innovative software mediation tool, the ACGT Mediator, used for hiding the complexity of query translation and data integration. One fundamental component is the implementation of a clinical trial management system, called ObTiMA, based on an ontology-driven software development process, providing uniform access to heterogeneous clinical trial, genetic and public biological databases.

Two large scenarios were developed and used to test the logical and execution architecture in general as well as separate tools and services. Training-evaluation sessions with end users were conducted to further increase robustness, reduce technical complexities in using the systems/services and improve the usability of the whole platform.

In 2009 ACGT established a formal collaboration with the European Organisation for Research and Treatment of Cancer (EORTC). EORTC's experience is an invaluable asset in achieving the project goals. ACGT was also made visible to end-user communities by being presented to important organizations in the field of oncology, such as the Breast International Group (BIG), and the International Society of Paediatric Oncology (SIOP) and by inviting external experts (such as an the European Clinical Research Infrastructures Network (ECRIN) representative to an advisory board meeting, where highly positive feedback was received.

Mature demonstrations of all the technological components functioning as a whole are now running. The project has been extended to July 2010 and by the end of the project, a solid platform for end-user communities will be developed.
The D4Science (Distributed coLaboratories Infrastructure on Grid-ENabled Technology for Science) project aims to continue the path that the GÉANT (a multi-gigabit pan-European data communications network), EGEE (Enabling Grids for E-science in Europe), and DILIGENT (A Digital Library Infrastructure on Grid Enabled Technology) projects have initiated towards establishing networking, Grid-based, and data-centric e-Infrastructures. These e-Infrastructures are expected to accelerate multidisciplinary research by overcoming several crucial barriers that stand in the way, primarily those related to heterogeneity, sustainability and scalability. In order to achieve this objective a D4Science production quality e-Infrastructure has been created, and will be progressively enriched and consolidated. It will provide facilities for creating Virtual Research Environments based on shared computational, data and service resources offered by many different providers like EGEE and large international organizations.

The D4Science project builds on the experience of a predecessor testbed project, DILIGENT (A Digital Library Infrastructure on Grid ENabled Technology). This was the first project to propose the integration of digital library and grid technology in order to create an innovative type of e-infrastructure capable of supporting scientific cooperation based on the managed sharing of a variety of resources. The core notions of the solution proposed by DILIGENT are virtual organizations, and virtual research environments.

User Communities
The project builds four ‘Virtual Research Environments’ (VREs), essentially laboratories, and services that are necessary to realize the main target scenarios established by the scientific communities concerned. This effort will also involve adaptations of community-specific data and service resources to exploit the e-Infrastructure capabilities. The four VREs are:

- The Fishery Country Profiles Production System that supports the generation of fisheries and aquaculture reports containing focused information in a country-specific format to enhance decision-making and promote advocacy in the sustainable use and conservation of aquatic resources.
- The Integrated Capture Information System that will integrate regional and global capture and distribution information of aquatic species, from a number of Regional Fishery Management Organisations (RFMOs) and international organisations (FAO, WorldFish Center) into a common system.
- The Global Ocean Chlorophyll Monitoring Virtual Research Environment that will integrate satellite data of microscopic marine plants and sea surface temperature. Microscopic marine plants (phytoplankton) contain chlorophyll, a green pigment used during photosynthesis. With satellite sensors, it is possible to measure chlorophyll concentrations in oceans, lakes and seas to indicate the distribution and amount of phytoplankton.
- The Global Land Vegetation Monitoring Virtual Research Environment that will integrate satellite images of vegetative land cover.

D4Science - Distributed coLaboratories Infrastructure on Grid-ENabled Technology for Science, a project funded by the European Commission (FP7 Capacities Programme, Research Infrastructures Theme)

EC funding: €3 150 000

ERCIM’s role: administrative coordinator

ERCIM members involved: CNR, University Basel (SARIT)

Scientific coordination: Donatella Castelli (CNR)

Duration: January 2008-December 2009

http://www.d4science.eu/
D4Science-II (Data infrastructure ecosystem for science) is an European e-Infrastructure project, co-funded by the European Commission's Seventh Framework Programme for Research and Technological Development. It constitutes a continuation of the DILIGENT and D4Science projects.

D4Science-II aims to provide mechanism for facilitating interoperation of the D4Science e-Infrastructure with diverse other data e-Infrastructures that are running autonomously thus creating the core of an e-Infrastructure Ecosystem. These e-Infrastructure Ecosystems will serve a significantly expanded set of communities dealing with multidisciplinary, scientific and societal challenges.

To set up a prototypical instance of such an ecosystem, D4Science-II will bring together several scientific e-Infrastructures established in areas such as biodiversity, fishery resources management and high energy physics. This will support several critical scientific scenarios - initially, this core will include: AQUAMAPS, DRIVER, GENESI-DR and INSPIRE- that are distinct but also feed into and enrich each other. In collaboration with appropriate international bodies and initiatives, D4Science-II will take steps to ensure sustainability of the Knowledge Ecosystem.

The Knowledge Ecosystem envisioned is composed of interoperable data e-Infrastructures, repositories, and scientific communities exploiting the services provided. The D4Science e-Infrastructure also plays a dual role: it will be a virtual aggregator of resources available in interoperable e-Infrastructures, and provider of these resources back to the participating e-Infrastructures and, through those, to complex VREs serving cross-domain scientific communities.

The D4Science-II enabling technology is gCube an innovative service-based, autonomic, Virtual Research Environment (VRE) management system. It supports the declarative and interactive creation of transient VREs that aggregate and deploy on-demand content resources and application services by exploiting computational and storage resources of a grid infrastructure.
Information and Communication Technologies (ICTs) are a great opportunity for the developing world. Providing minimal services (health, education, business, government, etc.) to rural communities and under-privileged populations is of major importance to improve people lives, and to sustain development. But, how to better connect people in developing countries? How can they directly benefit from access to ICT? Which easy-to-use device will help rural communities in their daily lives? What are the most promising broadband technologies to solve the “last mile” issue? What are the challenges to make the mobile Web accessible, relevant, usable and useful in development actions?

The Digital World Forum project gathered the foremost experts in the field of inclusive and accessible ICT and developing countries in a context of sustainable development. A particular focus of the project was to involve local actors from industry, research and academic communities and NGOs with field expertise in Sub-Saharan Africa and Latin America.

The premier goal was to create synergy between all stakeholders in order to be able to build cooperation roadmaps in the field of ICT research, thus identifying and connecting initiatives at the global level, the regional level and the local level, identifying common factors and distinctive traits. The roadmap will also identify pertinent research actions for FP7 and facilitate creation and collaborative use of ICT tools that support sustainable economic development at the grass-roots and policy-making levels, and enable EU policy in this domain to be actively put forward on a global stage.

The Digital World Forum (DWF) closing event took place in Brussels on Wednesday 30 September 2009. This event was an opportunity for the consortium partners to expose the results of their work and to network with an audience of experts. One expected outcome of this event was to look into future directions of work and future funding schemes, using the completed technological roadmaps that were achieved in the DWF technological work packages. The DWF project partners have explored the use of low-cost technologies to "connect the unconnected". They focused their research work on topics related to:

- mobile Web for development (led by the W3C Mobile Web Initiative),
- low-cost access devices (led by CSIR/Meraka),
- low-cost broadband infrastructure (led by Orange Labs).

The overall goal of the Digital World Forum project was to define research work directions to be taken up by research and development communities, as well as European Technology Platforms (ETPs). This specific final event both acted as a very useful dissemination relay and as a kick-off for new concerted initiatives for development in emerging markets.

Digital World Forum: To connect the Unconnected. Use of low-cost technologies to bridge the digital divide

EC funding: € 701 235

ERCIM’s role: project coordinator

ERCIM members involved: ERCIM/W3C

Duration: January 2008 to September 2009

http://www.digitalworldforum.eu/
The Euro-India ICT Co-operation Initiative (Euro-India) was established to reinforce collaborative research and innovation activities between Indians and Europeans in ICT domains and challenges targeted in the EU’s FP7. The project played a central role in creating awareness on the following key focus areas:

- Identify, exploit and sustain EU & Indian RTD potential through an exhaustive mapping of the Indian ICT knowledge, research and innovation landscape
- Provide critical inputs to strengthen policy dialogue between the EU and India by exploring common ground between the ICT programme in the EU’s 7th Framework Programme and the Indian Information Society policy
- Reinforce the promotion of the EU ICT programme and increase Indian commitment and participation
- Network a wide range of stakeholders through an institutional mechanism and a well-defined agenda in order to evolve and support a vibrant EuroIndia ICT research community.

EUROINDIA, owing to its highly qualified and strongly committed consortium and through the comprehensive knowledge mapping of the Indian ICT RTD landscape, helped in building a comprehensive understanding of the Indian ICT research ecosystem, ambitions and technological and societal priorities.

EuroIndia organized a series of events in India during 2009: Two international conferences and four “information days” and was also invited to conduct a thematic session within the elIndia Conference.

January 2009 two information days were held respectively in Mumbai and Delhi. The first information day was hosted by the prestigious Indian Institute of Technology (IIT) in Mumbai and the second one during the conference. The first EuroIndia International conference took place in conjunction with the India R&D 2009: ICT Innovations conference organised by Federation of Indian Chambers of Commerce and Industry (FICCI) on 22-23 January in New Delhi. The EuroIndia ICT Cooperation session was attended by about 150 delegates.

Two Information Days were held in Chennai on 25 August at the Indian Institute of Technology and on 26 August in Hyderabad, catering mainly for participants from industry. Both events offered participants a comprehensive understanding of the European 7th Framework Programme and the ICT Work programme 2009-10.

The final Euro-India international conference was hosted by the International Management Institute on 10-11 December 2009 in New Delhi. The event was divided into three sections:
- Presentation of the findings of the two-year extensive mapping.
- Presentation of international academic papers on ICT innovations, focusing on collaborative endeavours between the EU and emerging economies.
- An exhibition in which some of the Indian enterprises and organizations revealed their innovations.

The project is continued by the follow-up project “Euro-India Spirit”, a 24 months “Support Action” running from January 2010 to December 2011.

Euro-India - Euro-India ICT Co-operation Initiative.

EC funding: €581 100

ERCIM’s role: project partner

ERCIM members involved:
GEIE ERCIM (with representatives from INRIA and Fraunhofer)

Duration: January 2008-December 2009

http://www.euroindia-ict.org/
The GridCOMP project’s main goal was the design and implementation of a component based framework suitable to support the development of efficient grid applications. The framework implements the "invisible grid" concept: abstract away grid related implementation details (hardware, OS, authorization and security, load, failure, etc.) that usually require high programming efforts to be dealt with. Therefore, GridCOMP makes possible to seamlessly compose applications and services deployed on large scale infrastructures, e.g. several thousand machines all over the world. The GridCOMP project bridges the gap between cutting edge research and industrial applications. Through the collaborative experience between academic and industrial partners, GridCOMP has forged strong collaborations thus producing sustainable results which will still be exploited beyond the project lifetime.

GridCOMP provides the reference implementation of the Grid Component Model (GCM). The developed prototype takes the ProActive Parallel Suite as the starting point to provide the functional features of GCM components such as:
- a deployment framework, standardized by ETSI (European Telecommunications Standards Institute) and providing interoperability with several grid schedulers and middleware,
- primitive and composite components supporting collective communications.

The GCM implementation targets all software architects in need of a comprehensive framework to express at design time the parallelisms and the distribution of an application. Therefore, the architecture of the system itself captures the parallel/distributed aspects, acting as a powerful specification and documentation.

To enable users to build large-scale Grid systems by integrating independent and possibly distributed software components into higher level composite components, the Grid Integrated Development Environment (GIDE) has been developed. The GIDE provides extensive user support for composition, deployment, monitoring, and steering of Grid applications provided through a tightly integration into Eclipse software framework. The main advantages of this tool are: reduced software development cycle, increased portability, and support for dynamic properties in the generic component-based Grid system built on top of the ProActive Grid middleware.

Four use cases have been developed and promote the capabilities of the GridCOMP framework:
- Extended Data Record Processing
- Biometric Identification
- Computing of “Days Sales Outstanding” value (the mean time that clients delay to pay an invoice).

These represent test cases as well as demo applications with respect to the GridCOMP component framework. They also point out the advanced features provided by the framework and, through their complete documentation, illustrate how they can be exploited in real world scenarios. The use cases represent a jump start for people new to GCM.
The Coordination Action InterLink (International Cooperation Activities in Future and Emerging ICTs), coordinated by ERCIM and ICS-FORTH, and funded by the Future and Emerging Technologies (FET) Programme of the European Commission, has elaborated research roadmaps for international collaboration in the domains of Software-Intensive Systems and New Computing Paradigms; Ambient Computing and Communication Environments and Intelligent and Cognitive Systems.

To attract and foster trans-disciplinary research excellence, research programmes involving international cooperation need to be defined around new grand challenges and/or key technological issues that have major economic importance or are derived from major societal drivers. Such programmes should explore visionary research themes, demanding breakthroughs in basic research and engineering in key technologies and investigating radically new uses for technology.

The main goals of InterLink were to:
• bring together internationally renowned scientists and highlight the latest advances in their areas
• facilitate the exchange of experiences and discussion of the latest progress and findings in challenging research problems relevant to the selected thematic areas
• collectively identify new research topics
• link European research communities to the best research carried out in other developed countries in the respective research fields
• enable European researchers to access knowledge, skills and technology available outside the EU
• provide a critical assessment of the advantages and disadvantages of different kinds of international collaboration
• promote European solutions and knowledge worldwide and influence the way in which science and technology evolve internationally
• build new international strategic alliances, wherever this may be of benefit to European efforts
• influence the design of new research programmes to be funded by the EC, and also by other funding agencies worldwide
• broadly disseminate the findings of InterLink at a European and international level.

InterLink has addressed three thematic areas carefully selected based on the need to address the evolution of the Information Society in the next ten to fifteen years and the challenges this imposes on computing, software engineering, cognition and intelligence:
1. Software intensive systems and new computing paradigms
2. Ambient computing and communication environments
3. Intelligent and cognitive system.

For each thematic area, a Working Group was established, and these worked in a coordinated fashion. They had a scientifically and geographically balanced participation, involving experts, mainly from the academic and research sectors, representing various research practices and innovation strategies, from Europe, North America, Australia, Asia and the Far East.

The final versions of the roadmaps are available at the InterLink project Web site. A booklet summarising the results is also available on the project Web site.
The overall objective of the Mobile Web 2.0 project was to address the usability and interoperability issues that are still holding back mobile Web access. For this purpose, the project developed the “mobileOK checker” a tool to check Web content for mobile friendliness, created authoring software to facilitate mobile Web authoring, conducted training on how to design Web sites that are usable on mobile devices and developed test suites to increase the interoperability of mobile Web browsers.

“mobileOK” Checker: The “mobileOK checker” is a web application developed within MobiWeb2.0 allowing web developers to check whether their content follows W3C-developed “Best Practices” to improve the user experience on mobile devices. The checker is based on an open-source library written in Java that can be integrated into other, similar tools. W3C is offering the checker as a free service at http://validator.w3.org/mobile/

Authoring Tools: The goal of this work was to facilitate the authoring of mobileOK content through contribution to open-source authoring tools. To achieve this goal, MobiWeb2.0 developed plug-ins for mobileOK authoring for the WordPress, Joomla!, and Moodle tools (the latter is an alpha version). The plug-ins and the libraries are available at http://www.w3.org/2009/11/mobileOKPythia/

Training: MobiWeb2.0 has organized multiple training events for Web content developers, explaining the importance of taking mobile access into account when developing Web content and educating developers in the production of “mobileOK” content. More information about training events is available at http://www.w3.org/Mobile/training/

Test Suites: To improve interoperability by increasing standards compliance, MobiWeb2.0 has maintained a Test Suites Working Group. This group developed test suites related to mobile Web access. Most importantly, two different integrated tests, called the “Web Compatibility Tests for Mobile Browsers” were developed. The working group works in public and its homepage is available at http://www.w3.org/2005/MWI/Tests/
Existing Warehouse Management Systems (WMS) provide advanced features to manage the movement of items within the warehouse, but fail to comply with the increasing demand on more numerical handling. Generally, WMS are lacking optimisation functionalities and advanced packing tools for determining how to pack items on a pallet, how many cartons are needed to pack customer items, how to pack pallets in a truck according to stability constraints and to the customer to visit, how to redesign a storage area, an assembly line, etc. The vision of the Net-WMS project is that these hard combinatorial optimisation functionalities can be addressed in a new generation of WMS with advanced software technologies combining rule-based knowledge representation, constraint programming optimisation, virtual reality interactions, and service oriented architecture.

Achievements
Nine test applications have been developed for evaluating and promoting the capabilities of the Net-WMS methodology. These test cases have been defined by the industrial partners of the project, constituting a representative variety of pallet loading, container loading and assembly-line design problems. Beyond the evaluation purposes of the Net-WMS technology, these use cases represent demonstration prototypes and illustrate how Net-WMS middleware components can be exploited in real world scenarios.

To achieve the end-user application objectives, the first scientific objective of Net-WMS was to make advances in the field of combinatorial optimisation by developing constraint programming techniques for bin packing, bin design and more generally placement problems. The geometrical kernel developed by the partners ARMINES and SICS for multidimensional non-overlapping constraints is an outstanding contribution which is the object of a series of publications concerning:
- Strong necessary conditions for nonoverlapping and re-use of global constraints,
- Filtering algorithms,
- Greedy heuristic use of the constraint,
- Evaluation on public benchmarks and on pallet loading problems.

A second objective of the project was to make constraint programming easier to use in the industry by designing a knowledge modelling language providing a very high level of abstraction for specifying bin packing and bin design problems and solving them transparently with constraint programming techniques. The Packing Knowledge Modelling Language PKML has been designed for the Net-WMS needs as a particular case of a general rule-based modelling language for constraint programming.

A third objective of Net-WMS was to make constraint-based optimisation specifically easier to use on placement problems by developing virtual reality concepts for solving packing problems. The virtual human worker developed by CEA and the prototypes of the collaborative system between the user and optimisation components developed by CEA and KLS OPTIM illustrate this highly innovative approach to computing solutions. To make all these software components work together in a fully networked and distributed WMS, a solid middleware architecture was the key.

The Net-WMS technology is already on the shelf for the market of logistics and warehouse management systems, and a large part of the collaborations between Net-WMS partners is expected to continue beyond the end of the project.
The aim of the PALETTE project was to facilitate and augment individual and organisational learning in Communities of Practice (CoPs). The project reached this objective by the provision of both a set of technology and learning services and a series of specific scenarios. From a technical perspective, interoperability between tools and extensibility of individual tools were key development issues. In order to ensure the alignment between scenarios, services and user needs in CoPs, a participative design approach was adopted, involving technical and pedagogical actors within the project as well as members of CoPs.

The first scenarios provided by PALETTE were ‘specific’, as they set out a central chain of activities of a particular CoP and include references to specific services and artefacts as well as the context. Then three ‘generic’ scenarios, that provide a de-contextualised description of a set of activities, were also elaborated, based on the categorisation of CoPs’ needs: ‘Knowledge reification’, ‘Collaboration: debate and decide’ and ‘Animation and moderation: identity building’. Finally, a larger number of ‘instantiated’ scenarios were defined. They apply some aspects of a generic scenario by introducing the relationship between activities and functions provided by services, without necessarily specifying which service will be used, given that several configurations of technical responses are possible for each scenario.

The technical partners of the project worked on the development of several IT services, which answer to CoPs’ needs, in respect to the generic scenarios:
- Information services – Amaya, DocReuse, LimSee3;
- Knowledge management services – SweetWiki, BayFac;
- Collaboration services – CoPe_it!, eLogbook.

Also, through the PALETTE Web Portal, users are provided with a way of customizing access to these services by adding and removing PALETTE widgets.

During the project, an important work was also dedicated to ‘Learning and Organisational Resources’ (LOR). They are akin to pedagogical scripts that give practical details on the running of an activity for learning or organisational purposes. They are designed to support the choice, use and adaptation of the services and generic scenarios by further communities. Three categories of LORs were developed within PALETTE framework: ‘Supporting and evaluating learning’, ‘Managing, developing and evaluating CoPs’, and ‘Choosing and appropriating tools and developing scenarios for their use’.

At last, a participative process was developed in order to ensure the alignment between services, scenarios and CoPs’ needs. This process, based on a Participatory Design Methodology (PDM), involves four main stages: ‘Analysing’, ‘Designing for use’, ‘Designing in use’ and ‘Disseminating’.

Several important dissemination and training activities were conducted during the last year of the project, in order to present the main pedagogical and technical outcomes of the project. Furthermore, the PALETTE Web site proposed to the user a ‘Service Gallery’ in which he/she can discover all the IT services and pedagogical material described above, understand their variety and how they complement each other.
In their daily interaction over the Internet, individuals contribute throughout their life leaving a life-long trail of personal data. Technological advances facilitate extensive data collection, unlimited storage and reuse of the individual's digital interactions. Today, individuals cannot protect their autonomy and cannot retain control over personal information, irrespective of their activities, as present information technologies hardly consider these requirements. This raises substantial new privacy challenges: how to protect privacy in emerging Internet applications such as collaborative scenarios and virtual communities; and how to maintain life-long privacy.

The PrimeLife project will address the core privacy and trust issues pertaining to the aforementioned challenges. Its long-term vision is to counter the trend to life-long personal data trails without compromising on functionality. It will build upon and expand the FP6 project Prime that has shown how privacy technologies can enable citizens to execute their legal rights to control personal information in on-line transactions. The main objective of the project is to bring sustainable privacy and identity management to future networks and services:

- Fundamentally understand privacy-enhancing identity management 'for life' (practical life, throughout life & beyond)
- Bring Privacy to the Web and its Applications
- Develop and make tools for privacy friendly identity management widely available -privacy live!

Resolving these issues requires substantial progress in many underlying technologies. PrimeLife will substantially advance the state of the art in the areas of human computer interfaces, configurable policy languages, web service federations, infrastructures and privacy-enhancing cryptography. It will also ensure that the community at large adopts the results of the project by working with the relevant Open Source communities, standardisation bodies and relevant partner's projects. It will further organise workshops to transfer technologies and concepts.
PrivacyOS is a thematic network for privacy protection infrastructure within the European Commission’s ICT Policy Support Programme. The project brings together industry, SMEs, Government, Academia and Civil Society to foster development and deployment of privacy infrastructures for Europe, serving as a marketplace for those offering solutions to those facing new challenges. The general objectives of PrivacyOS are to create a long-term collaboration in the thematic network and establish collective interfaces with other EU projects. In a series of PrivacyOS conferences participants exchange research and best practices, as well as develop strategies and joint projects following four core policy goals:

- awareness-raising,
- enabling privacy on the Web
- fostering privacy-friendly Identity Management,
- stipulating research.

Coordination of ongoing activities and sharing of information and experience are a key component of the network. Conferences have been held on Location based Services, Electronic ID-Cards, Participation, Privacy Seals, and cryptographic mechanisms to name a few.

Over a two-year lifetime of the project four Open Space conferences have been held in Strasbourg, Berlin, Vienna and Oxford. The reports including the presentations are available for download from the project Web site.

PrivacyOS - European Privacy Open Space

EC funding: € 328,000

ERCIM’s role:
W3C is project partner

ERCIM members involved:
KU Leuven (FNRS/FWO)

Coordination: Independent Centre for Privacy Protection (Unabhängiges Landeszentrum für Datenschutz, Schleswig Holstein), Germany

Duration: June 2008 - May 2010

https://www.privacyos.eu/
The vision of the RACE networkRFID, supported by the European ICT Policy Support Programme is to provide a RFID network of excellence that creates opportunities and increases the competitiveness of European Member States in the area of RFID through innovation, development and implementation. At the same time it will position RFID technology within the mainstream of information and communications technology.

The network draws upon the expertise of Member States and the evolving RFID community to create a dynamic, change-responsive capability that not only aligns with the initial Information and Communications Technologies Support Programme objectives, but extends that capability to accommodate emergent and future needs.

RACE networkRFID will meet the pressing need to generate greater awareness and uptake and the exploitation of user-facing opportunities for innovation and enterprise. It will capitalise on work done by European projects and national initiatives to confirm Europe’s position as a leading force in RFID.

In the first months of its lifetime, the network gathered 25 contractual members and more than 32 associated members. The network gave input to the European Commission, to workshops, and standards organisations. The members of “Work Package 2 – Technology Roadmap and Market Analysis” prepared an “RFID Market Analysis Summary Report” rolling out a market analysis for the near future and clarify the context of the current state of the art regarding technology and market conditions.

Another milestone is the database of RFID use cases that will provide an excellent overview of existing European RFID solutions. The database will be filled with exemplary case studies and pilot studies that have been undertaken for RFID that demonstrate the business support capabilities of the technologies and the potential for achieving significant return on investment emphasising the importance of the business case for success. This Web-based database has been developed and is hosted by ERCIM.
VITALAS is an integrated project addressing the issue of digital archiving. The main strategic objective is to enable cross-media indexing and retrieval, as well as to design and develop new methods that will allow for content aggregation through the automatic annotation of content. Another important topic is scalability – the ability of such engines to cope with large amounts of multi-media content. The project is also looking at the question of how to present search results to the user, how to provide interactive and economical search interfaces, and also how to develop interactive search mechanisms.

The VITALAS system is based on a Web services oriented architecture that allows a step by step integration of both software and graphical user interface components. During the first semester of 2008, the first version (V1) of the VITALAS system was implemented enabling cross-media search (combining semantic search, textual and visual concepts search, visual similarity search) on a corpus of 10,000 annotated images provided by the Belgian News Agency Belga. In addition, advanced visualisation functionality offers the possibility to the user to navigate in the corpus using a cluster view interface.

The VITALAS system integrates text, video and audio modules. The final version enables audio queries and visual queries, analyse of non-textual content in such a manner that textual annotation from audio and visual content analysis can be automatically predicted and generated. Moreover, considering the large number and different nature of the modules envisaged to be integrated into one single system, the VITALAS Graphical User Interface will offer a professional brand-new user interface design, profiles and preferences facilities, visualisation tools, as well as audio and video support, light boxes and relevance feedback.

During the second year of the project, the scientific research topics were:

- Enabling technologies: specification and development of the V2 SoA modules: content media indexing and new visual local features
- Cross-media indexing (fusion) with the implementation of a state-of-the-art cross-media indexing tool
- Cross-media retrieval
- Implementation of the second version of the required baseline system to allow integration of audio and video components.
- Specification of success criteria, which include evaluation criteria for both the end-user system and for the academic evaluation of technical modules.

The final version V3 of the system will enhance and strengthen the V2 with a distributed processing framework and will include the final versions of VITALAS components. The major activities to come will therefore be to extend integration and collaboration between partners in the VITALAS system in order to make it more stable and scale up the developed technology.
The Virtual Physiological Human Network of Excellence (VPH NoE) is a methodological and technological framework that will enable collaborative investigation of the human body as a single complex system.

The collective framework will make it possible to share resources and observations formed by institutions and organizations creating disparate, but integrated computer models of the mechanical, physical and biochemical functions of a living human body.

This system will enable scientists, clinicians and researchers to improve their understanding of human physiology and pathology, to derive predictive hypotheses and simulations, develop and test new therapies, with the eventual outcome of better disease prevention tools in healthcare.

The VPH NoE was launched in June 2008, under the coordination of University College London. The network aims to provide the necessary infrastructure including computational methodologies, tools and databases that will enable scientists, clinicians and researchers to communicate, and to exchange data and technologies in a standardised way. To achieve this, the VPH NoE has several key objectives:

- support for inter-institution and interdisciplinary research projects;
- development of a VPH ToolKit - shared and mutually accessible computational resources and infrastructure;
- progression in horizontal and vertical model/data integration;
- development of interdisciplinary training activities and VPH careers;
- creation of Industrial, Clinical and Scientific Advisory Boards for consultation.

The VPH NoE will connect the diverse VPH projects, from those funded as part of the VPH initiative (VPH-I) to encompass related projects funded under previous EC frameworks and national funding schemes, industry, healthcare providers and international organisations.

The VPH NoE will play a part in strengthening and supporting increased interdisciplinarity and integration of European biomedical research. This is to be achieved by fostering cooperation between disciplines and institutions. The following aims will be addressed:

- creation of a more cohesive VPH research community, within and beyond the EU;
- enhanced recognition at a national level of the importance of modelling and simulation in biomedicine;
- increased emphasis on interdisciplinary training in both biological and biomedical-engineering physics curricula.

Main achievements in 2009 included the excellent progress in the community building process; several of the ‘Seed Exemplar projects’ that have been established; and the further development of the online ‘ToolKit’ (http://toolkit.vph-noe.eu/). The key to success for this ToolKit is openness of tools, methods and services, to enable sharing of resources and developments, and to drive standardisation so as to improve model interoperability. This will remain a major focus of the network’s effort together with efforts to reach out beyond the established circles to demonstrate utility of VPH-related developments, and to actively forge links with clinical and industry research and development.
The Web Accessibility Initiative (WAI) works with organizations around the world to develop strategies, guidelines, and resources to help make the Web accessible to people with disabilities.

A priority for inclusion under Call FP6-2005-IST-5 is the development and constitution of adequate technology platforms to meet the challenges posed by the ageing population. One key technology needed by the ageing population is the World Wide Web.

Activities under "Web Accessibility Initiative: Ageing Education and Harmonisation" (WAI-AGE) include activities to enable better understanding of the needs of the ageing community in the context of existing Web accessibility guidelines; activities to work with the ageing community to obtain more direct contribution into W3C/WAI work, to revise existing and develop new educational materials to better reflect the needs of the ageing community, and to pursue standards coordination to promote adoption and implementation of a common set of guidelines.

The first objective of the Web Accessibility Initiative: Ageing Education and Harmonisation (WAI-AGE) is to inform the development of extensions on WAI guidelines and supplemental educational materials which can better promote and meet the needs of people who have accessibility needs related to ageing, with particular relevance to the needs of the elderly in Europe.

A second objective is to better inform the ongoing work of W3C/WAI with regard to the needs of the elderly, and to create an ongoing dialogue between ageing communities and disability communities and other stakeholder groups on the needs of older Web users with accessibility needs.

A key objective of this project is to provide educational resources focused towards industry implementers, including developers of mainstream technologies, assistive technologies, and Web designers and developers.

A parallel objective is to provide educational resources focused towards organisations representing and serving ageing communities, and towards individuals with accessibility needs related to ageing.

A final yet crucial objective is to promote increased harmonisation of Web accessibility standards so as to further build a unified market for technology developers and expedite the production of Web accessibility solutions.

The WAI-AGE project plans a number of educational and outreach deliverables to extend the findings of the project both to industry and to users. Current work-in-progress includes:
- Before and After Demonstrations
- How People with Disabilities use the Web
- Better Web Browsing: Tips for Customizing Your Computer
- Requirements for ‘Accessible Web Browsing’
- Relationship Between Web Accessibility and Usability
- Web Accessibility Training.
The activities of a Working Group can be divided into several areas: workshops to build the community and maintain its vibrancy, projects designed to advance R&D in the particular area of the Group, and human mobility (internal mobility and fellows) to assure the appropriate trained human capital. ERCIM supports financially the Working Groups.

A major activity of an ERCIM Working Group is to search actively for project funding that crosses national borders. NetWMS for example, was initiated by the ERCIM Working Group “Constraints”.

ERCIM institutes have reserved resources to stimulate mobility, enabling work on collaborative research projects at other institutes for periods from one to six months. Working Groups are also invited to identify topics of interest to be included in the half-yearly calls published for the ERCIM ‘Alain Bensoussan’ Fellowship Programme, and as a consequence can participate in this programme by hosting a fellow. ERCIM Working Groups contribute many of the articles in ERCIM News and commonly provide scientific coordination for the special theme sections. They also participate in the production of ERCIM strategic reports.

New Working Groups established in 2009

Two new ERCIM Working Groups have been established recently: The Working Group "Social Network Analysis" focusing on algorithmic aspects of network data analysis and the Working Group "Models and Logics for Quantitative Analysis" exploring and developing methods for formal verification of modern advanced software systems.

Social Network Analysis

The ERCIM working group on Social Network Analysis (SNA) will foster European collaboration in research on data analysis for social networks. The main objective of the SNA group is to build a strong network of researchers with expertise on algorithmic aspects of network data analysis. The first action will be to foster collaboration through the organisation of scientific meetings with the medium-term objective of collaborating on funded research programmes in this area.

Research in network data analysis is being transformed by access to large-scale data resources. The availability of this data in electronic format presents some interesting challenges and opportunities for data analysis. In particular, social networking sites are prominent sources of such data. Given that the defining characteristics of social networks are that at least some of the nodes in the network are human actors, the analysis of such networks can be used to provide useful insights into how people interact. However, fundamental research problems exist, and many of these problems are common among several research domains.

Areas of interest include:
- Algorithmic aspects of large-scale networked data analysis
- Information retrieval over social media
- Data mining and semantic web approaches for social media enrichment.

The SNA working group sees significant synergies with existing ERCIM working groups such as “Computing and Statistics” and “Data and Information Spaces (DIS)”.

The initial meeting of the SNA WG attracted 29 participants from nine universities and two industry partners with a keynote lecture...
from Prof. Barry Smyth of University College Dublin. The meeting led to agreement on the name and scope of the working group with a follow-up meeting held in Italy in November during the ERCIM week.

http://wiki.ercim.eu/wg/SNA

Models and Logics for Quantitative Analysis

The remit of the Working Group is to explore and develop methods for formal verification of modern advanced software systems. Such methods have already been successfully applied to self-contained and relatively simple systems. The group will develop new methods and expand the applicability of previous methods in order to formally verify the functionality of complex interacting modern software systems. This will be done by combining recent theory and methods from computer science and mathematical modelling.

A large fraction of contemporary Information Technology systems are either Embedded Systems (offering autonomous and intelligent control of complex physical systems) or Service-Oriented Architectures (providing Web services designed to support machine-to-machine interaction over a network). This tendency will greatly increase in what will become the Internet of the Future, an integrated system comprising telecommunications, the Internet, and small systems embedded in domestic appliances. Cutting-edge examples include intelligent vehicles that actively prevent accidents, intelligent homes that actively support your lifestyle, and services for handling electronic shopping and secure payments. On a larger scale, the future integration of medical equipment, emergency support systems, electronic hospital records and next-generation communication technology are examples pointing towards the trend of Service-Oriented Systems incorporating a number of embedded components. On an even larger scale, we begin to see IT Guided Workflow Systems where the humans mainly play the role of domain experts (e.g. a doctor who is an expert in a given treatment) rather than being in charge of the overall workflow (e.g. monitoring the treatment history from the point of view of the patient). Outside the traditional domains of IT systems, the use of computer science modelling and analysis techniques is also growing in the life sciences, in particular the modelling of components of biological systems.

The need for stability in the IT infrastructure of our future society demands that a number of fundamental properties be validated for the IT systems of interest. This spans properties related to security (e.g. “no virus can allow outsiders to get access to my Internet banking account”), performance/dependability (e.g. “my critical Internet service will be available 99.99% of the time”) and resource usage (e.g. “the control system rotates and adjusts the windmill such that at least 60% of the potential wind energy is utilized”). Even the formulation of these properties becomes nontrivial when addressing IT Guided Workflow Systems that have humans as “subsystems” and when addressing the description of three-dimensional behaviour in biological systems.

The challenge in the modelling and validation of embedded and service-oriented systems is that due to their interaction with the surrounding physical environment, they must include aspects that are discrete (e.g. providing security guarantees), stochastic (e.g. dealing with performance) and continuous (e.g. providing measurements of resource usage). A shift is required in the development of IT systems from the study of discrete properties to also include stochastic and continuous properties, not least when addressing IT Guided Workflow Systems. The use of stochastic and continuous properties is equally important in the life sciences.

To meet the above challenge we need powerful modelling methods and algorithms for the analysis of discrete, stochastic and continuous properties. The aim of this Working Group is to create both a venue for knowledge sharing in this exciting area and a network for young researchers; furthermore to share tools for performing analyses and to create joint European research projects on quantitative analysis.

The activities of the ERCIM Working Group on Models and Logics for Quantitative Analysis (MLQA) will study process models that are appropriate for describing the behaviour of systems and logics that are suitable for describing their quantitative properties.

The activities will:
• model behaviour of processes by means of transition systems, automata or process calculi
• model quantitative properties using logics for expressing not only discrete but also stochastic and continuous properties
• focus on algorithms, theory and tools
• study applications with particular emphasis on embedded systems and service-oriented systems, but aim also to treat IT Guided Workflow Systems and biological systems.

http://wiki.ercim.eu/wg/MLQA
Working Group Activity Overview

Computing and Statistics

The working group Computing and Statistics focuses on all computational aspects of statistics. Of particular interest is research in important statistical applications areas where both computing techniques and numerical methods have a major impact. The working group gathers over 300 members and is organised in eleven specialized tracks. The aim is twofold: first, to consolidate the research in computational statistics that is scattered throughout Europe; second to provide researches with a network from which they can obtain an unrivalled sources of information about the most recent developments in computational statistics and applications. Emphasis is put on computational methods with computational statisticians being the primary target of the WG.

Coordinator: Erricos Kontoghiorghes, School of Computer Science and Information Systems, Birkbeck, University of London

Selected joint publications:


Organised event:
2nd International Workshop of the ERCIM Working Group on Computing & Statistics, Limassol, Cyprus, 29-31 October 2009. The workshop had about 200 presentations covering all specialized topics of the Working Group. Most of the tracks had organized a series of sessions. The workshop took place jointly with the 3rd International Conference on Computational and Financial Econometrics (CFE’09). At the joint meeting gathered around to 540 participants and 480 presentations were given. CFE09 is organized by the Working Group’s track on “Computational Econometrics and Financial Time Series”.

http://www.cfe-csd.org/ercim

Constraints

The Constraints Working Groups focuses on research related to constraint programming. Constraint programming has been successfully applied in numerous domains. Recent applications include computer graphics (to express geometric coherence in the case of scene analysis), natural language processing (construction of efficient parsers), database systems (to ensure and/or restore consistency of the data), operations research problems (like optimization problems), molecular biology (DNA sequencing), business applications (option trading), electrical engineering (to locate faults), circuit design (to compute layouts), etc. Current research in this area deals with various foundational issues, with implementation aspects and with new applications of constraint programming. The concept of constraint solving forms the central aspect of this research.

Coordinator: Barry O’Sullivan, University College Cork

Joint project:
Net-WMS - Towards integrating virtual reality and optimisation techniques in a new generation of Networked businesses in Warehouse Management Systems under constraints
The Net-WMS project proposes a software solution enabling the expected new generation of networked businesses WMS. Net-WMS will handle networked communication and co-operation processes through the integration of decision-making technologies, generic 3D placement primitives, virtual reality for 3D visualisation, interactivity to design packing models and knowledge modelling. The added-value and competitiveness increase of the Net-
WMS solution will be characterised by shared expertise, easy deployment and maintenance, flexibility, interoperability, better resource handling and access to remote services. (see also chapter “Projects” in this report)

Selected joint publications:
  http://dx.doi.org/10.1007/978-3-642-03251-6

Organised event:
CSCLP 2009: Annual ERCIM Workshop on Constraint Solving and Constraint Logic Programming, Barcelona, Spain, 15-17 June 2009. The workshop covered all aspects of constraint and logic programming, including various foundational issues, implementation techniques, new applications as well as teaching issues. Particular emphasis was on assessing the current state of the art and identifying future directions.

http://wiki.ercim.eu/wg/Constraints/

Data and Information Spaces

The objective of the ERCIM Working Group on Data and Information Spaces is to build a strong network of researchers in the fields of information repositories and digital libraries. Of special importance is the development of methods and tools to make digital, cultural and scientific content available, searchable and accessible for all kinds of users. Interoperability should be achieved on schema levels, repository levels as well as on system levels.

Coordinator: Ingeborg Torvik Sølvberg, NTNU

Organised event:
The first ERCIM DIS Workshop, Paris, 27 May 2009

The workshop was co-located with the ERCIM 20th anniversary event and attended by 20 participants. Four submitted papers were presented. Two invited talks were given by Wolfgang Nejdl on “Exploiting User Generated Content to Improve Web Search” and by Keith Jeffrey on ‘Data information and knowledge for e-science and e-infrastructure (DIS and e-science)’.

http://wiki.ercim.eu/wg/DIS/

Dependable Software-Intensive Embedded Systems

The ERCIM Working Group ‘Dependable Software-Intensive Embedded Systems’ organised several exhibitions and events together with ARTEMIS, EPoSS, AARIT, EWICS, OCG where ERCIM was promoted through the display of roll-ups and the distribution of flyers and ERCIM News.

Coordinators: Erwin Schoitsch, Austrian Research Centers/AARIT and Amund Skavhaug, NTNU

Selected joint publications:

Organised events:
- Joint DES/FMICS Workshop at ERCIM 20th Anniversary Event “Formal Methods and Dependable Embedded Systems”, Paris, 27 May 2009. Presentations were given by Radu Mateescu (INRIA), Jaco van de Pol (UTwente), W. Herzner (ARC), A. Skavhaug (NTNU), Pedro Merino Gómez (UMA), A. Fantechi (ISTI) and E. Schoitsch (ARC).
- Euromicro-SEAA, Patras, Greece 27-29 August 2009. The working group organised a special session on Dependable Embedded System covering dependable embedded systems design, architecture, V&V, safety, trust, standardization, real-time languages and timing and RAMS analysis.
• Workshop at SAFECOMP 2009, Hamburg, Germany, 15 September 2009. The workshop gathered 20 participants and covered topics such as network reliability/dependability, embedded medical devices, total integration in industrial automation systems, embedded systems standardization, MBD in avionics, avionics certification (DO 178B).

• Interdisciplinary Information Management Talks (IDIMT) 2009, Jindrichuv Hradec, Czech Republic, 9-11 September 2009. Dependability of Systems - a Systemic Challenge was the topic of this conference attended by 50 participants.

http://www.ercim.at/

Digital Patient

The Digital Patient Working Group aims to contribute significantly to the promotion of Virtual Physiological Human (VPH) research across Europe in synergy with other initiatives. The main interests of its participants focus on the development of frameworks for integrating mathematical models in different scales (from molecular to tissue/organ), in order to better understand different pathologies as well as the effect of different therapeutic schemes on the individual patient. This is a particularly challenging problem for the VPH research.

Coordinator: Ioannis Tollis, ICS-FORTH

Organised event:
Workshop: "W6: Intelligent Systems Design and Applications in the Health Domain" at the 9th International Conference on Intelligent Systems Design and Applications (ISDA'09), Pisa, Italy, 30 November - 2 December 2009. The workshop was very successful and attended by over 35 people. (http://isda09.isti.cnr.it/)

Fellow hosted from the ERCIM Alain Bensoussan Fellowship Programme:
Vincenzo Lagani at FORTH-ICS from 1 October 2009 - 30 September 2010

http://www.ics.forth.gr/bmi/digitalP/

E-mobility

The ERCIM eMobility working group aims to develop strategic basic research agenda and project proposals in the area of eMobility. To complement the activities of the eMobility European Technology Platform (ETP), the working group focuses on more (theoretical) basic research issues. The goal is long-term research projects with a more academic background, without having any commercial constrains.

Coordinator: Torsten Braun, University of Bern, Switzerland/SARIT

Selected joint publications:

Organised events:
• 3rd ERCIM Workshop on eMobility at University of Twente, The Netherlands 27-28 May 2009, in conjunction with WWIC 2009. More than 30 participants attended the workshop. The program was formed of several invited talks as well as contributions received from an open call for papers. The workshop started with two invited talks given by Prof. Fernando Boavida (University of Coimbra) and Prof. Aiko Pras (University of Twente) presenting two already running FP7 Networks of Excellence. The other invited presentations given by Thomas Michael Bohnert (SAP Zürich, see photograph) and Prof. Geert Heijenk (University of Twente) focused on different vehicle communication issues.
• 5th IEEE Broadband Wireless Access Workshop (BWA), Honolulu, Hawaii, USA, 30 November 2009, co-located with IEEE GLOBECOM 2009. Prof. Thomas Magedanz (TU Berlin) gave a keynote entitled ‘Towards Broadband Wireless Access Integration - Understanding the Role of the 3GPP Evolved Packet Core (EPC)’. The workshop was co-organized by SAP, University of Coimbra, University of Tampere, Karlstad University (http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5282400)

Fellows hosted from the ERCIM Alain Bensoussan Fellowship Programme:
Djamel Djenouri at UPC Barcelona from 7-14 May 2009
Kirsten Dolfus at University of Bern / SARIT from 1 July 2009 - 31 March 2010

http://wiki.ercim.eu/wg/eMobility/

Environmental Modelling

The ERCIM Working Group Environmental Modelling provides a platform for the discussion of research related to environmental applications that carry a number of special demands such as complexity (dimension, structure with abiotic and biotic subsystems), scale (amount of data, distribution, heterogeneity), modelling for different purposes (scenario analysis, emergency response, risk management etc), the need for adaptability (coupling of models, parameter adjustment etc), longevity of data and applicability to different purposes. These demands have led to a variety of current research themes, such as parallel, distributed and Grid computing, knowledge from data, decision support, intel-
Intelligent/adaptive user interfaces and visualization, standardization of metadata and system interfaces, workflows for automatic access to distributed resources, and the generic nature of information and simulation systems.

Coordinator: Steffen Unger, Fraunhofer-FIRST

Organised event:
• 15th ERCIM Environmental Modelling Group Workshop, Paris, 20 May 2009. The workshop was held in conjunction with the ERCIM 20th anniversary event and covered topics such as forecast of local wind fields for increasing of wind farm power output by data fusion methods, design and optimization of traffic and energy infrastructure networks in the Megacities of the future to reduce the emission of greenhouse gases towards a sustainable development of these Megacities, further advances in Air Quality Modelling, in particular, integration with urban high-resolution land data assimilation systems, detection of motion on fluid flow images. In addition, possibilities for joint proposals were discussed.

http://ercim.first.fraunhofer.de

Formal Methods for Industrial Critical Systems

Formal methods have been advocated as a means of increasing the reliability of systems, especially those which are safety or business critical, but the industrial uptake of such methods has been slow. This is due to the perceived difficulty of mathematical nature of these methods, the lack of tool support, and the lack of precedents where formal methods have been proven to be effective. It is even more difficult to develop automatic specification and verification tools due to limitations like state explosion, undecidability, etc. The FMICS Working Group brings together researchers of the ERCIM consortium and beyond in order to promote the use of formal methods within industry.

Coordinator:
Alessandro Fantechi, University of Florence and ISTI-CNR

Selected joint publications:
• Special Section on FMICS 05 in International Journal on Software Tools for Technology Transfer (STTT), Tiziana Margaria and Mieke Massink (Eds.). Volume 11, Number 5, November 2009 (http://www.springerlink.com/content/w13702835644/)

Organised events:
• 14th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2009), Eindhoven, The Netherlands, 2-3 November 2009. The aim of the FMICS workshop series is to provide a forum for researchers who are interested in the development and application of formal methods in industry. In particular, these workshops bring together scientists and engineers that are active in the area of formal methods and interested in exchanging their experiences in the industrial usage of these methods. These workshops also strive to promote research and development for the improvement of formal methods and tools for industrial applications.
• Joint DES/FMICS Workshop at ERCIM 20th Anniversary Event “Formal Methods and Dependable Embedded Systems”, Paris, 27 May 2009. Experiences were exchanged, projects and scientific work were presented, and further cooperation was discussed, especially in light of the successful jointly edited special theme ‘Safety-Critical Software’ of ERCIM News 75. Possible cooperation in the editing of a book on safety-critical software was also discussed.

http://www.inrialpes.fr/vasy/fmics/index.html

Grids, P2P and Services

The ERCIM Working Group “Grids, P2P and Services” aims to ensure the sustainability of the CoreGRID Network of Excellence, requested by both the European Commission and the CoreGRID members who want to continue and extend their successful cooperation, and to establish a forum to foster collaboration between research communities that are now involved in the
emerging area of Service Computing, namely high performance computing, distributed systems and software engineering.

Coordinator: Frédéric Desprez, INRIA

Selected joint publications:


• Improving the Dependability of Grids via Short-Term Failure Predictions. A. Andrzejak, D. Zeinalipour-Yazti, M.D. Dikaïakos. The CoreGRID ERCIM Workshop on Grids, P2P and Service Computing (CoreGrid'09), in conjunction with EuroPAR'09, Delft, Netherlands, August 24, 2009 (http://www.zib.de/andrzejak/my-papers/EuroPar09-ShortTermPredictions.pdf)


Organised event:
CoreGRID ERCIM Working Group Workshop on Grids, P2P and Service Computing, Delft, The Netherlands, 24 August 2009, in conjunction with EuroPAR 2009. Two invited speakers gave interesting talks around Cloud computing platforms and middleware (Kate Keahey from Argonne National lab) and about the XtreemOS project (Thilo Kielmann from Vrije Universiteit Amsterdam). Ten presentations from accepted papers were also given as well as presentations from the topic leaders of the Working Group. Many interesting discussions were held during the two days. The workshop was attended by some 50 participants.

Fellow hosted from the ERCIM Alain Bensoussan Fellowship Programme:
Thierry Gautier at ArTeCS group at Universidad Complutense de Madrid, Spain from 1 September 2009 - 31. August 2010

http://www.coregrid.net/

IM2IM - IT and Mathematics applied to Interventional Medicine

The ERCIM Working Group IM2IM focuses on applied mathematics and computer science applied in many ways in advances in medical techniques such as image processing, computer graphics and virtual reality, modelling and simulation of the behaviour of biological tissues and robotics.

Coordinator: Marc Thiriet, INRIA

Organised event:
IM2IM annual meeting, Paris, 26-29 May 2009, in conjunction with the ERCIM 20th anniversary event. The meeting was mainly dedicated to discussions on the Virtual Physiological Human project, presentations of team know-how and discussions on possible topics for proposals in the 7th Framework Programme

http://wiki.ercim.eu/wg/IM2IM/

Models and Logics for Quantitative Analysis

See a detailed presentation of this new Working Group established in 2009 on page 32.

Coordinator: Flemming Nielson, DTU Informatics / DANAIM

http://wiki.ercim.eu/wg/MLQA/

Multimedia Understanding with Semantics

Computation and Learning (MUSCLE)

The Working Group is a continuation of the MUSCLE Network of Excellence that established and fostered closer collaboration between research groups in multimedia datamining and machine learning. Members are working on image and video processing, speech and text analysis, statistics and machine learning. The goal is to explore the full potential of statistical learning and cross-modal interaction for the (semi-)automatic generation of robust meta-data with high semantic value for multimedia documents.

Coordinator: Sanni Siltanen, VTT

Organised events:
• Muscle Working Group workshop, 20 May 2009, Paris, in conjunction with the ERCIM 20th anniversary event. The workshop was mainly dedicated to networking and cooperation planning and was attended by 14 participants from 13 institutes.
• Group meeting in Pisa on 20 November 2009 with seven participants.
Security and Trust Management

The ERCIM Working Group Security and Trust Management aims at focusing the research of the ERCIM institutions on a series of activities, for example projects and workshops, to foster the European research and development on security, trust and privacy in ICT.

Coordinator: Javier Lopez, University of Malaga, SparCIM

Selected joint publication:

Organised event:
5th International Workshop on Security and Trust Management (STM 2009), Saint Malo, France, 24-25 September 2009 in conjunction with the 14th European Symposium On Research in Computer Security (ESORICS 2009). The workshop gathered 15 attendees. STM 2009 received 22 submissions from 12 countries and accepted 11 papers. Papers were organized in five sessions on areas such as information security management, social networks and trust, cryptography, privacy and language-based security, reputation management, and access control and usage control. The technical program was complemented by two invited talks. The first talk “Selected Topics in Physical-Layer Security” given by Srdjan Capkun focused on different network security issues at physical layer. The second talk “Privacy and Security in Pervasive Environments” given by Claudio A. Ardagna, winner of the ERCIM STM WG award for the best Ph.D. Thesis on Security and Trust management, focused on challenges and issues related to location privacy and anonymous protocols for mobile communications.

http://www.iit.cnr.it/STM-WG

Sensor Web

The objective of the Sensor Web Working Group is to promote and facilitate interactions between various R&D groups inside and outside ERCIM, in multidisciplinary themes relevant to the Sensor Web. The Working Group members cover a wide range of ICT skills (software engineers, information management and databases including information retrieval, wireless applications, networks, security and e-mobility, ambient and ubiquitous computing), and through their collaborators have a broad multidisciplinary base. Areas of interest to the group include both applied and basic research. Examples of deployment areas include personal health, environmental analysis, ambient intelligence, locomotive and large vehicle monitoring, military applications, deployment of personnel in toxic environments and traffic analysis.

Coordinator: Gregory M. P. O’Hare, University College Dublin,

Selected joint publications:

http://wiki.ercim.eu/wg/SensorWeb/

Social Network Analysis

See a detailed presentation of this new Working Group established in 2009 on page 31.

Coordinator: Pádraig Cunningham, University College Dublin/IUA
WG Web site: http://wiki.ercim.eu/wg/SNA/
Software Engineering for Resilient Systems

The Software Engineering for Resilient Systems (SERENE) Working Group considers resilient systems as open and distributed systems that can dynamically adapt in a predictable way to unexpected events. Engineering such systems is a challenging issue still not solved. Achieving this objective is a very complex task since it implies reasoning explicitly and in a combined way, on system’s functional and non-functional characteristics. The SERENE working group focuses on formal, semi-formal modeling of resilience properties; frameworks and design patterns for resilience; error handling and fault handling in the software life-cycle; re-engineering for resilience; component-based development and resilience; software development processes for resilience; resilience through exception handling in the software life-cycle; atomic actions; fault-tolerance; dynamic Resilience Mechanisms; resilience prediction; resilience metadata; reasoning and adaptation services for improving and ensuring resilience; intelligent and adaptive approaches to engineering resilient systems; engineering of self-healing autonomic systems; dynamic reconfiguration for resilience; run-time management of resilience requirements; verification and validation of resilient systems; CASE tools; Model Driven Engineering; software architectures for resilience.

Coordinator: Nicolas Guelfi, University of Luxembourg/FNR

Organised event: SERENE Working Group Meeting, Paris 27 May 2009, in conjunction with the ERCIM 20th anniversary event. Presentations were given by Giovanna Di Marzo, John Fitzgerald, Mohamed Kaaniche and Elena Troubitsyna. Further discussions were held on possible further activities of the network such as the proposal for a special issue of ERCIM News on Resilience, a Handbook of Resilience of Software and Systems, EC proposals, mobility proposal for a summer school on Resilience of Software and Systems, mobility proposal for master students exchange between the working group members, and the organisation of a SERENE contest on Resilience of Software and Systems.

http://rise.uni.lu/tiki/tiki-index.php

Software Evolution

The main goal of the ERCIM Working Group Software Evolution is to understand the phenomenon of software evolution, and to develop well-founded and disciplined tools and techniques to support software developers with the common problems they encounter when evolving large and complex software systems. With this initiative, the group plans to become a Virtual European Research and Training Centre on Software Evolution.

Coordinator: Tom Mens, Université de Mons-Hainaut/FNRS/FNR

Selected joint publications:

Organised events:
• IWPSE/EVOL 2009: Joint 10th Int’l Workshop on Principles on Software Evolution and 5th ERCIM Workshop on Software Evolution, Amsterdam, The Netherlands, 24-25 August 2009. The Working Group on Software Evolution held its 5th annual workshop, jointly with the 10th edition of IWPSE (International Workshop on Principles of Software Evolution). To celebrate the 10th anniversary of IWPSE and the 5th anniversary of EVOL, a special edition at ESEC/FSE 2009 was organised where people from both communities could meet to discuss the latest trends and developments in software evolution.
• BENEVOL 2009: 8th Belgian-Netherlands Seminar on Software Evolution, Louvain-la-Neuve, Belgium, 17-18 December 2009. The aim of the seminar is to bring together researchers from Belgium, The Netherlands and neighbouring countries to identify and discuss important principles, problems, techniques and results related to software evolution research and practice.

Fellows hosted from the ERCIM Alain Bensoussan Fellowship Programme:
Anthony Cleve at INRIA, Lille, France, 1 December 2009 to 30 November 2010

http://wiki.ercim.eu/wg/SoftwareEvolution
The PhD Fellowship Programme has been established as one of the premier activities of ERCIM. Since its inception in 1991, over 200 fellows have passed through the programme. In 2009, 42 young scientists commenced an ERCIM PhD Fellowship and 63 fellows had been hosted during the year. This represents 419 person-months, an enormous increase in effort compared to 2008 (294 person/months) and 2007 (202 person months).

The ERCIM Fellowship Programme is open to young researchers from all over the world. It focuses mainly on topics of interest identified by the ERCIM Working Groups and the research projects managed by ERCIM. Ideally, a fellow will work in two ERCIM institutes, thus contributing not only to the work done locally, but also to cohesion between ERCIM partners and to the cross-fertilisation and cooperation between research groups working in similar areas in different laboratories.

The fellowship scheme also helps young scientists to become involved in one of the ERCIM Working Group initiatives, to improve their knowledge of European research structures and networks and to gain more insight into the working conditions of leading European research institutions. In 2009, about 60 percent of the hosted fellows were native of countries outside the European Union. This reflects ERCIM’s contribution to make Europe not only the world’s biggest ‘brain factory’ but also a large ‘brain magnet’ in the field of informatics and applied mathematics.

Fellowships are either of eighteen months duration, spent in two member institutes or of twelve months spent in one institute. Fellows receive a monthly allowance, which may vary depending on the hosting country. In order to encourage mobility, a member institution is not eligible to host a candidate of the same nationality.

Candidates must:
• have obtained a PhD degree in the four years prior to the application deadline, or be in the last year of the thesis work with an outstanding academic record
• be fluent in English
• be discharged or get deferment from military service
• have completed their PhD before starting the grant.

Deadlines for applications are currently 30 April and 30 September each year.

Since 2005 the Fellowship Programme has been named in honour of Alain Bensoussan, former president of INRIA and one of the three ERCIM founding fathers together with Cor Baayen (former president of CWI) and Gerhard Seegmueller (former president of GMD).

http://www.ercim.eu/activity/fellows
ERCIM fellows hosted in 2009

- Ash Mohammad Abbas at NTNU
- Saiful Akbar at NTNU
- Claudia Patricia Ayala Martínez at NTNU
- Filippo Bonchi at CWI and INRIA
- Markus Brunk at NTNU
- Alfonso Caiazzo at INRIA
- Ana Capatana at DANAIM and NTNU
- Alex Cartagena Gordillo at NTNU
- Yanling Chen at NTNU
- Alex Chen Chung Shue at CWI
- Anthony Cleve at INRIA
- Henriette Cramer at SICS
- Elisabetta De Maria at INRIA
- Ding Ding Jianguo at FNR and NTNU
- Djamel Djenouri at NTNU
- Christos Douikanidis at NTNU
- Lhoussain El Fadil at NTNU
- Georgios Evangelidis at FHG
- Sara Felloni at NTNU
- Raffaele Gaetano at INRIA
- Marek Gayer at NTNU and VTT
- Sarunam Girdzjiauskas at SICS
- Bao-Quoc Ho at NTNU
- Florian Horn at CWI and FNR
- Shashidhar Kodamballi at FHG
- Jari Korhonen at NTNU
- Margarita Kotti at CNR
- Kyriakos Kritikos at CNR
- Lakshmanan Kuppusamy at CWI and INRIA
- Vincenzo Lagani at FORTH
- Jérôme Lapuyade-Lahorgue at DANAIM and VTT

- Frédéric Larue at FHG
- Yan Liu at FHG
- Assaf Mar-Or at NTNU
- Ricardo Marroquim at CNR
- Helena Mentis at SICS
- Luca Mottola at SICS
- María Naya Plasencia at SARIT
- Shahaf Nitzan-Hahamov at NTNU
- Inah Omoronyia at NTNU
- Ghassan Oreiby at DANAIM
- Georgios Pitsilis at NTNU
- Eugen Costin Popovici at CWI and FHG
- Srihathai Prammanee at VTT
- Rajendra Prasath at NTNU
- Jesus Maria Rios Aliaga at FNR
- Etienne Riviere at NTNU
- Chiara Rossito at NTNU
- Cristina Santini at NTNU
- Christian Schellewald at NTNU
- Elena Sendroiu at NTNU
- Annette Stahl at NTNU
- Sattanathan Subramanian at NTNU
- Orestis Telelou at CWI
- Kirsten Terfloth at SARIT
- Alessandra Toninelli at INRIA
- Despoina Triantafyllidou at VTT
- Dimitrios Ververidis at VTT
- Akrivi Vlachou at NTNU
- Wei Wang at NTNU
- Xinhui Wang at NTNU
- Sergey Zhuk at INRIA

Number of fellows starting a grant in the given year.
In a tight competition, the ERCIM Executive Committee has chosen Teemu Roos from the Helsinki Institute for Information Technology HIIT as the winner of the 2009 Cor Baayen Award for a promising young researcher in computer science and applied mathematics.

Teemu Roos received his PhD degree from the University of Helsinki, Finland, in September 2007. The title of his thesis is “Statistical and Information-Theoretic Methods for Data Analysis”. During and after his postgraduate studies, Teemu Roos, has performed groundbreaking research by combining advanced theoretical reasoning with innovative technical solutions in the fields of information theory, data analysis and machine learning. He has attacked and solved practical problems of utmost importance in an unusually wide range of applications. His two equivalence results that establish formal connections between Bayesian network classifiers and logistic regression, and between regularized Haar wavelets and so called variable length Markov chains, can be considered theoretical as well as practical breakthroughs.

Teemu also stated and proved a theorem about the possibility of inductive generalizations to as yet unseen cases under a certain mild stationarity assumption, a result that was formerly claimed, and generally believed, to be impossible in its present form. For this work, he received the best paper award at the Belgian-Dutch Conference on AI in 2005. His highly cited work in mobile device positioning has been patented and successfully commercialized in the award-winning spin-off company Ekahau Inc. (Frost & Sullivan Technology Leadership Award, European Union Information Society Technology Prize, Software Industry Summit Best Commercialized Innovation in Finland, etc.). As an another example, in collaboration with historians, Roos has gained significant advances in the study of the “evolution” of ancient manuscripts by unprejudiced application of state-of-the-art information-theoretic methods to stemmatology, a long-standing problem in textual criticism.

Teemu Roos has already at this phase of his career demonstrated capability for independent, multifaceted, creative, and highly original work, producing both theoretical and practical solutions of undisputable societal and commercial value. The positioning techniques, some of which he introduced already in his MSc thesis, are being used every day in more than 150 hospitals around the world, and numerous other locations in government, military, and industry.

He has also been active in making his scientific work known to the public: he has appeared in the press and television in connection with the stemmatological work. As a young researcher, Temu Roos is already a regular invited speaker and organizer in various scientific workshops. He works fluently with the leading figures in his field, including Prof. Peter Grünwald (Amsterdam), Prof. Bin Yu (UC Berkeley), and the information-theoretist, Prof. Emeritus Jorma Rissanen (IBM Research).

Teemu Roos was awarded the Junior Researcher Prize of the Department of Computer Science, University of Helsinki in 2006, and his dissertation was shortlisted for the 2008 North-American Classification Society Distinguished Dissertation Award.

http://www.ercim.eu/activity/cor-baayen-award
Collaborative research and development in ICT (Information and Communication Technologies) plays a major role in determining the prosperity of Europe. ERCIM and ETSI, the European Telecommunications Standards Institute, have established a close collaboration to:

- exploit areas of synergy between research and standardisation in the innovation food chain
- accelerate R&D innovation cycles
- reduce time-to-market.

ERCIM and ETSI have launched the Infinity Initiative to help achieve these objectives and boost innovation in Europe. The Infinity Initiative is a series of high profile events on key research topics which have not yet been introduced into mainstream standardisation within ETSI.

As such, the second edition of the ERCIM-ETSI Infinity Initiative took place on 2-3 April at ETSI in Sophia Antipolis, France. The theme of the 2009 advanced seminar was ‘Bio-ICT: The Heart in the Computer’, with a special focus on ‘Modelling and Simulation of Organs’.

The event was run in cooperation with the European Commission and was supported by the VPH (Virtual Physiological Human) Network of Excellence, a network of which ERCIM is a core member (see project presentation on page 29).

Systems Biology, the new science of complexity of living systems, will herald a fundamental change in paradigm with the appearance of life models and simulation systems making possible computer assisted experiments for biological, medical and pharmaceutical research. As such, the modelling and simulation of life is one of the most promising research areas with great hopes for humanity.

Building on the success of the previous event on “Ambient Computing”, the three co-organisers welcomed experts who shared their vision of modelling and simulation of life while demonstrating how research and standards, supported by the European Commission, can benefit society and business. Delegates included scientists, industry leaders, EC decision-makers and major players in the field.

With the purpose of “Fusing Research with Standardisation for Knowledge and Business”, ERCIM and ETSI believe it is essential that standardisation be considered early in the R&D cycle in order to facilitate maximum creation and development of home and international markets for the European industry.
With its Event Sponsorship Programme, ERCIM supports conferences, workshops and summer schools. ERCIM selects events for sponsorship that are relevant to the ERCIM community and of excellent scientific quality.

In return for financial support, ERCIM sponsorship must be acknowledged in all publicity material relating to the event. Promotional and informational material received prior to event commencement must be distributed to the conference participants as part of the participant’s conference package. Event organizers must provide free-of-charge attendance, should ERCIM decide to send a representative. They must also provide a booth in a reasonably prominent place, from which materials and further information can be distributed. Event organizers must include the ERCIM logo with a link to the ERCIM Web pages on the title (reference) page of the conference, commencing from the time of successful PR sponsorship negotiation and continuing for the remaining existence of these Web pages.

Events sponsored in 2009

- WWW’09 - 18th International World Wide Web Conference, Madrid, 20-24 April
- ECOOP 2009 - 23rd European Conference on Object-Oriented Programming, Genova, Italy, 6-10 July 2009
Since its creation, ERCIM News has evolved from ERCIM’s ‘in-house newsletter’ into a periodic multi-disciplinary European magazine in the domains of Information and Computer Sciences, Applied Mathematics and Communication Technologies, published in both printed and online editions.

ERCIM News mainly consists of articles written by scientists and edited according to guidelines designed to make the articles accessible to all target groups. However, invited articles by European policy-makers and decision-makers in relevant areas are also included.

ERCIM News' objective is to provide regular and continually updated high-quality and authoritative information concerning European research and development and technology transfer activities in the scientific domains of interest. The information is reported in an expository and easily accessible fashion, with references and links being provided so that the interested reader can find more in-depth information on specific topics as needed. The intended target audience will thus be international and national scientific policy- and decision-makers, European and national funding agencies, the global scientific community and relevant industrial organisations, with a special focus on the European area.

ERCIM News covers reports and news relating to scientific projects from all over Europe and even beyond, reflecting ERCIM’s growth over the years. Published quarterly, the magazine provides regular high-quality information concerning the latest European R&D and technology transfer activities. Through short articles and news items, it provides a forum for the exchange of information between both member institutes and the wider scientific community.

With each issue focusing on a special theme, the ERCIM News series has become a unique collection providing an overview of different topics within information technology. In 2009 ERCIM covered the following special themes:

- The Sensor Web
- Future Internet Technology
- Mathematics for Finance and Economy
- Green Computing.

For each issue, ERCIM News invites a personality to write a keynote statement relevant to the European scientific community. Authors have included Barry Smyth, CLARITY: The Centre for Sensor Web Technologies, Ireland; Viviane Reding, Member of the European Commission Information Society & Media; Michael A H Dempster, Centre for Financial Research, Statistical Laboratory, University of Cambridge & Cambridge Systems Associates; and Mazin Yousif, PhD CEO, Avirtec Corporation and chair of the ERCIM Advisory Committee.

ERCIM News is the result of close cooperation between all ERCIM institutes. It is published in both printed and electronic form. The printed edition has a circulation of about 9,000 copies and is distributed in over 100 countries. The online edition offers full-text searching and the numerous sites and documents quoted can easily be accessed on the Web. ERCIM News has made a significant contribution to the wider recognition of ERCIM.

http://ercim-news.ercim.eu/
ERCIM Innovation

The ERCIM Innovation magazine is part of ERCIM strategy to foster ICT innovation for the benefit of the European economy and society. The ERCIM network federates more than 12,000 scientists and engineers whose research results and collaborations nurture innovations in ICT, which can then translate into concrete and useful applications contributing to changing the world in which we live.

ERCIM Innovation showcases innovative developments in ERCIM member institutions with a view to finding commercial exploitation partners. It reports on spin-offs from our members institutes as a string of research results turned into success stories. It covers the importance of standardisation and the venture capital aspect of innovation. It includes opinion pieces from politicians, opinion formers and innovation experts from leading companies and SMEs alike. It demonstrates how higher education bodies encourage an innovation-oriented mindset in their courses. And it highlights how the European Union handles this key challenge of the knowledge society.

The first two issues November 2008 and November 2009 were produced in cooperation with British Publishers and targeted an audience of over 9,000 in Europe, including decision-makers from industry, standardisation, investment and obviously research and academia, as well as European institutions. The magazine is free. Copies can be ordered on the ERCIM Web site where an electronic version is also available.

Central editor: Catherine Marchand, ERCIM Office.
ERCIM has one member institute per country. With the Portuguese ERCIM Grouping (PEG) joining ERCIM in October 2008, there are now twenty member organisations.

A member institute must be a leading research establishment in its country with excellent links to both its national and the international research communities. All ERCIM members are national centres of excellence and are independent of specific commercial ties. They have a strong involvement in the research programmes of the European Union and joint projects with both small and medium-sized enterprises and large industrial companies.
AARIT, the Austrian Association for Research in IT (Österreichische Vereinigung für IT-Forschung), was founded in May 2001 as a platform for the Austrian information technology research community. AARIT is a legal entity and an independent non-profit association. AARIT is ERCIM’s gateway to the Austrian information technology research community.

The mission of AARIT is to promote research and development in information technology and related subject areas. To achieve this, AARIT aims to strengthen scientific co-operation among its members on a national level, through international co-operation and through transfer of know-how and knowledge. The activities of AARIT include cooperation and participation in scientific organisations nationally and internationally. The Association carries out, participates in or commissions research projects, organises meetings and courses, and participates in conferences. Further activities include the granting of fellowships, awards and sponsorships and the collection and exchange of information among members and third parties.

Members
AARIT has both institutional members and individual members. The institutional members of AARIT cover a wide range of research activities. AARIT members participate in research projects such as AGIRD (Austrian GRID Consortium), image processing and advanced computer vision, safety and security of software intensive systems, embedded systems, natural language processing, bio-informatics and social aspects of IT. Institutional members include:

- Austrian Research Centers, the largest application-oriented research enterprise in the country, with about 1000 employees, where of about four hundred information technologists, work at locations across Austria.
- The Austrian Computer Society (OCG - Österreichische Computer Gesellschaft) is Austria’s umbrella organisation of associations and institutions involved in information processing.
- Austrian Research Institute for Artificial Intelligence (ÖFAI). At ÖFAI basic and applied research is performed in several areas of Artificial Intelligence.
- Salzburg Research - The Salzburg Research Forschungsgesellschaft mbH is a state-owned, non-profit research organisation.
- VCPC (European Centre for Parallel Computing in Vienna), established at the at the University of Vienna as part of the Institute for Software Science. Its primary objective is to furthering the use of parallel, distributed, and Grid computing.
- RISC (Research Institute for Symbolic Computation) is an institute of the Johannes Kepler University in Linz. RISC focuses on the interaction and integration of mathematics and computer science.
- Department for Information Systems at the Vienna University of Technology.

Since its foundation, AARIT has acquired further seven members (and last one founding) from universities and close-to-university institutes at Linz (2), Graz (3) and Vienna (2).

CNR in ERCIM
The President of CNR has delegated the ICT Department to represent CNR in ERCIM. ERCIM related activities at CNR are mainly covered by the following two ICT institutes, located in Pisa:

- Istituto di Scienze e Tecnologie dell’Informazione
- Istituto di Informatica e Telematica

The strategic research areas currently covered at ISTI are software engineering, formal methods for specification and verification, information engineering and information systems, data mining, digital libraries, high-performance computing, dependable computing, wireless and mobile networks, human computer interaction, visual computing, image and signal processing, space flight dynamics, materials and structural mechanics.

The strategic research areas currently covered at IIT are wireless networks and computational sciences (efficient algorithms for complex problems). IIT also represents the Italian Registry in charge of domain names within the country code top level domain “it” (ISO 3166).

Combined Budget
Total funding is €17.8 million per year, of which €6.9 million is from projects:
- 65% EC projects
- 20% national projects
- 15% contract research from industry

Staff
Approximately 220 scientific staff and 302 support staff, plus a varying number of graduate students.

Contact:
ERCIM
Wollzeile 1-3
A-1070 Vienna
Austria
Tel: +43 1 512 02 35-0
Fax: +43 1 512 02 35-9
aari(at)aari.at
http://www.aarit.at/

Contact:
AARIT
Moruzzi, 1
56124 Pisa
Italy
Tel: +39 050 315 2878
Fax: +39 050 315 2810
http://www.isti.cnr.it/

Informatics and Applied Mathematics at the Italian National Research Council

The Italian National Research Council (CNR) is a government funded organization which conducts research in nearly all the main scientific disciplines through a network of research institutes. CNR funding covers the main infrastructures, permanent staff, and some basic research. Individual institutes must find additional funding from national and international contracts. From 2006, the scientific activities of CNR are structured in eleven macro research areas, each one coordinated by a Department. The Department for Information and Communication Technologies is responsible for the coordination and evaluation of the scientific and technical activities of the seven CNR institutes working in this sector.

- IAS1 – Istituto di Analisi dei Sistemi e di Informatica, Rome
- ICAR – Istituto di Calcolo e Reti ad Alte Prestazioni, Cosenza, Naples and Palermo
- IPIIT – Istituto di Elettronica e di Ingegneria dell’Informazione e delle Telecomunicazioni, Torino, Milan and Bologna
- ISTIT – Istituto di Informatica e Telematica, Pisa
- IMATI – Istituto di Matematica Applicata e Tecnologie Informatiche, Pavia, Genova and Milan
- IREA – Istituto per il Rilevamento Elettromagnetico dell’Ambiente, Naples
- IIT – Istituto di Scienze e Tecnologie dell’Informazione, Pisa

3D scan with colour acquisition of a bronze statue attributed to Cellini, Archeological Museum, Florence.
CRCIM is a consortium consisting of four major Czech R&D institutes active in informatics and mathematics:

- Charles University, Faculty of Mathematics and Physics, Prague
- Institute of Information Theory and Automation, Academy of Sciences, Prague
- Masaryk University, Faculty of Informatics, Brno
- Institute of Computer Science, Academy of Sciences, Prague.

**Mission**
The mission of CRCIM is to perform frontier research and teaching in mathematics, informatics and computer science and to transfer acquired new knowledge to society.

**Research Topics**
- Informatics: Control Theory, Econometrics, Pattern Recognition, Image Processing, Statistics and Data Processing;
- Software Engineering and Methodology of Programming, Distributed Systems Design, Computer Networks, Electronic Typesetting, Advanced Man-Machine Interfaces, Data Visualization, Information Systems;

**Budget**
Estimated total annual budget: 12 million €
- 70% basic national funding
- 30% participation in (inter)national research programmes and from contracts with industry.

**Staff**
1120 Researchers / Teachers (estimation).

Contact:
Czech Research Consortium for Informatics and Mathematics
co/FI MU Botanicka 68a
CZ-602 00 Brno
Czech Republic
Tel: +420 2 6884669
Fax: +420 2 6884903
http://staff.utia.cas.cz/~haindl/CRCIM/home.html

Members

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Dutch centre for mathematics and computer science

**A FUNDAMENTAL DIFFERENCE**

**Strategy**
We concentrate our research on four societally-relevant themes:
- Earth and Life Sciences
- The Data Explosion
- Societal Logistics
- Software as Service
to provide a deeper understanding of problems across the health care, climate, communication, congestion, security and service domains.

**International Network**
CWI closely cooperates with companies, universities and large technology institutes in the Netherlands and abroad. Together with our partners, we help provide a firm foundation for national and European innovation. CWI is also an incubator for senior academic researchers. World-wide, 180 full professors have come from CWI.

**CWI Today**
CWI concentrates on fundamental questions that are inspired by practical problems.
Some applications are: Robust railroad timetables, transport planning agents, querying large distributed databases for astronomy, interactive television research, wind farm aerodynamics, cryptography, semi-automatic recognition of individual whales, semantic tools for cultural web databases, software renovation, simulations of living cells, models for lightning, performance analysis of communication networks, analyzing data of cancer patients, and desktop VR systems.

**Budget**
Total annual budget: 17.5 million € (2009). Nearly 70 percent of our annual budget is covered by the Netherlands Organisation for Scientific Research (NWO), with the balance coming from national and international research programmes and assignments from industry.

**Staff**
- 154 Researchers
- 49 Supporting Staff

**Contact**
Centrum Wiskunde & Informatica
Science Park 123
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The Netherlands
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Fax: +31 20 592 4199
E-mail: info@ewi.nl
www.cwi.nl
DANAIM (Danish Research Association for Informatics and Mathematics) is a research consortium established by seven major Danish universities and university collaborations.

In Denmark there is a long tradition of international collaboration with other universities and collaboration with industry. DANAIM will strengthen the cooperation between Danish and other European researchers and industry.

DANAIM Represents almost all Danish Universities
DANAIM is a consortium of seven universities:
• University of Southern Denmark
• University of Aarhus
• Roskilde University
• Technical University of Denmark
• IT Vest – networking Universities
• University of Copenhagen
• Aalborg University.

DANAIM Represents 440 researchers within the field of computer science and related fields and an annual turnover of more than €30 million. More than 75% of the students enrolled for computer science or related areas are enrolled at the institutions represented by DANAIM.

Contact
DANAIM
At: Henriette Frahm
c/o Aalborg Universitet, Institut for Datalogi
Selma Lagerlöfs Vej 300; 9220 Aalborg Ø, Denmark
E-mail: frahm@cs.aau.dk
http://www.danaim.dk/

The Fraunhofer ICT Group (Fraunhofer Information and Communication Technology Group) develops joint strategies and visions for application-oriented research on information and communication technology. It combines the core competencies of the 14 member and 3 guest institutes to create comprehensive research programs and offers support in technology transfer activities and research marketing. This makes it the largest research alliance for information and communication technology in Europe, and one of the biggest in the world.

The complementary core competencies of member institutes cover the full value chain within the communication and IT sector.

The Fraunhofer ICT Group provides its product portfolio to partners from industry and the public sector.

The range of services includes customized IT solutions, specialized technology consulting, and preliminary research for new products and services. Being members within international research programs, the institutes are internetworked worldwide with business and research companies in the communication and IT sector. The business office of the ICT Group in Berlin acts as a »one-stop shop« to find the right partner for your need.

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Fax: +49 30 72 61 54 61 9
info@de.fraunhofer.de
www.ict.fraunhofer.de

Information and Communication Technology for
• Digital Media
• E-Business
• E-Government
• Sustainability
• Medicine

Production
• Security
• Finance IT
• Automotive
Luxembourg’s National Research Fund (FNR) is a public institution with scientific, financial and administrative autonomy, set up in 1999 in order to further stimulate research activities in Luxembourg.

To fulfill this mission, the FNR develops multi-annual research programmes and ensures their implementation by allocation of the financial means put at its disposal.

Main participating research institutes in informatics:
- Centre de recherche public Gabriel Lippmann http://www.lippmann.lu
- Centre de recherche public Henri Tudor http://www.tudor.lu
- Université du Luxembourg http://www.uni.lu
- Interdisciplinary Centre for Security, Reliability and Trust http://www.securityandtrust.lu
- Centre de recherche public de la Santé http://www.crp-sante.lu

Main research programmes in informatics:
- CORE Programme (started in 2008)

The CORE programme is designed to feature regular annual calls based on the FNR’s priority research domains.

The call is open to project proposals in 15 areas, among which:
- Information Security and Trust Management
- Business Service Design
- Telecommunication and Multimedia
- Performance & DVL of the Financial Systems

The FWO - Vlaanderen (Fonds voor Wetenschappelijk Onderzoek) activities are aimed at a push back of the frontiers of knowledge in all disciplines, stimulating and funding fundamental academic research at the universities in the Flemish Community and at scientific research institutes.

The Fonds National de la Recherche Scientifique has a mission statement to develop scientific research in general through researchers initiatives. It helps knowledge production and development through individual researchers sponsoring and through research programs within laboratories and departments from universities in the Belgian French Community (Communauté française de Belgique).

The FNRS action is thus mainly centered around researchers training and research development.
Mission
The mission of the Institute of Computer Science of the Foundation for Research and Technology – Hellas (FORTH-ICS) is 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.

FORTH-ICS develops innovative products and services, contributes to the creation, transfer, and diffusion of technical knowledge, collaborates with recognized companies, creates spin-off companies, promotes incubators and science and technology parks, and performs studies of regional and national interest.

FORTH-ICS is highly competitive at an international level, and many of its activities are carried out in the context of European collaborative research and development projects, which emphasise the development of Information Society Technologies and infrastructures in a number of domains of national importance and regional interest.

Research Laboratories
- Biomedical Informatics
- Computer Architecture and VLSI Systems
- Computational Vision and Robotics
- Distributed Computing Systems
- Human - Computer Interaction
  - Centre for Universal Access and Assistive Technologies
- Information Systems
  - Centre for Cultural Informatics
- Telecommunications and Networks

Programmes
- Ambient Intelligence
- Information Security

Departments
- Education and Training
- Registry of [gr] Domain Names
- Systems and Networks
- FORTHnet Computer Emergency Response Team
- W3C Greece Office

Personnel
FORTH-ICS employs a total of 360 people:
- 45 researchers and university faculty
- 145 technical staff members
- 15 administrative and auxiliary staff members
- 135 graduate research assistants & trainees

Annual Budget
Approx. 115 MEuros

Contact:
INSTITUTE OF COMPUTER SCIENCE
TECHNOLOGY-HELLAS (FORTH)
FORTH-ICS is one of the seven institutes of FORTH, a major national research centre, functioning under the auspices and partially funded by the General Secretariat for Research and Technology of the Hellenic Ministry of Education, Lifelong Learning and Religious Affairs.
Irish Universities Association

The Irish Universities’ Association (UIA) is the representative body of the Heads the seven Irish universities. It is a non-profit making body with charitable status.

The UIA seeks to advance university education and research through the formulation and pursuit of collective policies and actions on behalf of the Irish Universities thereby contributing to Ireland’s social, cultural and economic well-being.

■ Irish Universities
The Irish University Association represents all seven Irish universities. These include the three Dublin-based universities of Dublin City University, Trinity College and University College Dublin, and the four regional universities of University College Cork, National University of Ireland in Galway, University of Limerick, and National University of Ireland in Maynooth.

As all seven Irish Universities comprise the UIA, the range of research themes is exhaustive.

At present, Dublin City University are responsible for ERCIM-related administration and coordination activities.

■ Focus on Dublin City University
Dublin City University promotes four broad research themes.

Dependable Systems
The focus of this theme is the development of reliable and secure software. This encompasses a number of different approaches to ensuring the dependability of software from softer approaches through software development methods and software project management, to more formal approaches through refinement, verification and automatic program construction.

Information Management
This theme has two major research areas: Digital Multimedia and Database Engineering and Interseroperable Systems. The Centre for Digital Video Processing (CDVP) researches in Biocomputation, in particular the work is on tentative-based operations. The Database Engineering and Interoperable Systems researchers develop formal and informal models for constructing database systems, and building semantic layers between heterogeneous information systems.

Language & Intelligence
This theme is primarily involved in research into and development of applications in two main areas: in the Speech and Language Processing area, the research themes include Machine Translation, Speech Processing, Computational Models of Semantics, Treebanks, Formal Syntax, Digital Signal Processing, Computer-Assisted Language Learning, Probabilistic Natural Language Processing and Parsing. In the area of Artificial Intelligence, the themes include Artificial Minds, Computational Models of Cognition, Knowledge Representation, Human-Computer Interaction, Cognitive Science, The Origins of Intelligence, Neural Networks and Autonomous Agents.

Modelling & Scientific Computing
The group explores models of the natural and artificial world, through computer solutions of problems, which due to their complexity, are intractable by conventional methods. Complex systems arise in a variety of fields, e.g. physics, biology, chemistry, ecology and other hybrid sciences, finance, socio-economic phenomena, and many others. Much of the current focus of the work is in Bio-computation, (e.g. Bioinformatics and Biodiversity).

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UIA
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Fax: +353 1 705 5442
http://ercim.computing.dcu.ie/

ERCIM Activity Report 2009

NTNU

NTNU, the Norwegian University of Science and Technology, represents the Norwegian research community in informatics and mathematics, including associated departments at SINTEF, the University of Oslo, the University of Bergen, the University of Tromsø and the Norwegian Computing Centre in Oslo.

The university’s Faculty of Information Technology, Mathematics and Electrical Engineering (http://www.ime.ntnu.no/) has responsibility for ERCIM activities, although relevant research is also co-ordinated within the framework of the strategic research area of Information and Communication Technology (ICT) (http://www.ntnu.no/ict).

■ Collaborative efforts
NTNU’s research staff is engaged in some 2000 R&D projects, while the university itself hosts between 20 and 30 major scientific conferences in an average year. NTNU has bilateral agreements for student exchanges with more than 200 non-Norwegian universities across the globe. NTNU also has a close working relationship with SINTEF, Scandinavia’s largest independent research institute, which has about 2000 employees.

SINTEF was originally established by NTNU, and those origins are reflected in the SINTEF buildings, located on the university campus. This co-location further promotes the synergies that result from cooperative research.

■ The Faculty of Information Technology, Mathematics and Electrical Engineering
The faculty has 290 academic staff and doctoral students, and is responsible for approximately 20 percent of the educational activity at NTNU.

• Department of Computer and Information Science
• Department of Electronics and Telecommunications
• Department of Electric Power Engineering
• Department of Mathematical Sciences
• Department of Engineering Cybernetics
• Department of Telematics.

■ Strategic research
Strategic research areas in ICT:
• Computational Science and Visualization
• Bioinformatics
• Health Informatics
• ICT in the Public Sector (eGovernment)
• Information Security
• Learning with ICT
• Language Technology
• ICT Basics
• eMobility.

■ Contact
Norwegian University of Science and Technology
Faculty of Information Technology, Mathematics and Electrical Engineering
N-7491 Trondheim, Norway
Tel: +47 73 59 80 35, Fax: +47 73 59 36 28
http://www.ime.ntnu.no/

Technology, software and Internet protocols that may work fine in a laboratory setting may fail under real-world pressures of commercial use. Wireless Trondheim, launched in September 2006, makes the inner city of Trondheim available as a working environment to test tomorrow’s wireless technology and services. Trondheim is also a test site for Intelligent Transport Systems. The projects are a cooperative effort among industrial partners, NTNU, the city of Trondheim, the Sør-Trøndelag county council, and the Trondheim Chamber of Commerce.
Two major Polish universities - the University of Warsaw and the University of Wroclaw - established together a new research consortium, 'PLERCIM' in January 2007, which represents Poland in ERCIM. PLERCIM will initiate and coordinate future cooperation between Polish and European researchers in applied mathematics and informatics within ERCIM activities.

The University of Warsaw
The University of Warsaw (Universitas Varsoviensis, est. 1817), is the largest university in Poland. It teaches over 56 000 undergraduate students and around 2100 PhD students in nineteen faculties. About 11 000 students graduate from the University every year. It offers a broad range of courses taught in Polish and English in 76 areas of study. The Faculty of Mathematics, Informatics and Mechanics, with almost 170 faculty members and researchers, is engaged in a wide spectrum of research areas, ranging from pure mathematics and theoretical computer science, to applied mathematics and applied areas of informatics. The Faculty consists of three Institutes: Mathematics (with over ninety faculty members), Informatics (almost fifty faculty members), and Applied Mathematics and Mechanics (with over thirty faculty members).

The University of Wroclaw
The University of Wroclaw (Universitas Wratislaviensis, est. 1702) is the largest university in the south-western part of Poland called Lower Silesia. It teaches over 40 000 undergraduate students and about 1300 PhD students in ten faculties. About 9000 students graduate from the University every year. The University offers a broad range of courses taught in Polish and English in over seventy areas of study. The Faculty of Mathematics and Computer Science consists of two parts: the Mathematical Institute and the Institute of Computer Science. It teaches 870 undergraduate students in mathematics, 520 undergraduate students in computer science and 50 students in PhD programmes in both disciplines.

Budget
Total annual budget: €10.5 million, thereof
- 90% basic national funding
- 10% national and international programmes.

Staff
- 400 scientific staff
- 100 supporting and administrative staff.

Contact
PLERCIM Office
Faculty of Mathematics, Informatics, and Mechanics
Warsaw University, Banacha 2
02-097 Warszawa, Poland
http://www.plercim.pl/
SARIT – The Swiss Association for Research in Information Technology

SARIT is a nonprofit association with the goals of fostering national and international collaboration within the ICT research community and of promoting the visibility and recognition of ICT research performed in Switzerland.

SARIT was founded in 1989 with the purpose of linking together the mostly small Swiss research groups in computer science and of promoting international collaboration. In 1998, SARIT was completely restructured; all professors in ICT-related topics at Swiss universities and Federal Institutes of Technology became individual members of SARIT together with industry-based ICT research units. Nowadays, after the advent of the Universities of Applied Science, SARIT also has members belonging to these institutions.

SARIT is the Swiss member of ERCIM. For this cooperation, SARIT plays the role of a "virtual research center" combining the efforts of the distributed Swiss IT research community and being its representative to all other ERCIM partners, eg, for the ERCIM "Alain Bensoussan" Fellowship Programme.

SARIT runs a Web site http://www.sarit.ch/ providing information about ICT-related research activities and events in Switzerland.

SICS

Swedish Institute of Computer Science (SICS) is the leading research institute of Sweden within the area of ICT. Highly qualified researchers conduct applied and fundamental research in strategic areas of computer and communication technologies, in close cooperation with industry and the international research community.

SICS undertakes research assignments for industry and actively participates in R&D programs funded by national and international bodies, such as VINNOVA and the European Commission.

SICS promotes exploitation of research results by cooperating with industry and society, encouraging start-up companies, providing open source software, and by participating in standardization programs, clusters, and media and public events.

MAIN RESEARCH AREAS

Intelligent Production
Monitoring, diagnosing, and optimizing industrial production

Design & IT
Design and IT in products and services

Mobile Life
The future ecosystem of truly mobile services

Global Computing
Sharing resources through secure dependable autonomic systems of services

Sensor Networks
Self-configuring, distributed, wireless sensor systems

Networked Systems
Building the future reliable Internet

ORGANISATION

Staff
90 researchers (45 PhDs)

Location
Stockholm (Kista)
Gothenburg
Uppsala
Västerås
Lund

Turnover
€ 10.1 million

SICS
Isafjordsg. 22
SE-164 29 Kista
Sweden
Tel: +46 8 633 1500
info@sics.se
www.sics.se
SpaRCIM is the Spanish Research Consortium for Informatics and Mathematics, sponsored by the Ministry of Science and Innovation (MICINN). Its decentralized organization is currently spread over five universities and one research institute from the Spanish Research Council (CSIC):

- Artificial Intelligence Research Institute (IIIA / CSIC)
- Univ. de Málaga (UMA)
- Univ. Politécnica de Catalunya (UPC)
- Univ. Politécnica de Madrid (UPM)
- Univ. Politécnica de Valencia (UPV)
- Univ. Rey Juan Carlos (URJC)

These Spanish institutions include a number of groups that are representative of Spanish Research in Computer Science. These groups are working on a great variety of research areas within Information Technology and Applied Mathematics.

Spain joined ERCIM in 1993 through AEDIMA, the first "consortium type" member of ERCIM. In 2003 participation continued through SpaRCIM, a more focused consortium aimed at representing Spanish computer science research in ERCIM. SpaRCIM headquarters are located in Madrid (UPM).

Within these areas, SpaRCIM aims at promoting high-quality research through multiple activities on the European scene, and in particular within ERCIM, such as participation in working groups, setting-up joint projects, or disseminating results to a broad audience including the research community, industry, and the public in general.

The main research areas of SpaRCIM are centered in:

- Formal methods and programming languages, design and analysis of critical systems, quality and security of computing systems, rule-based programming, optimization, parallel and concurrent systems, programmer efficiency.
- Artificial intelligence: machine learning, multi-agent systems, constraint-based reasoning, ontologies, semantic web services, image processing and recognition.
- Information systems: data mining, databases, data warehouses, modeling, decision support systems.

Staff

- Around 500 scientists including over 200 doctoral candidates and 40 postdocs and engineers.

Recent Applications

XtreemOS - Building and Promoting a Linux-based Operating System to Support Virtual Organizations for Next Generation Grids. Computing Grids enable the sharing of a wide range of resources to solve large-scale computational and data intensive problems in science and engineering. While much has been done to build Grid middleware on top of existing operating systems, XtreemOS extends the underlying operating system to enable Grid computing by embedding key functionalities directly into the Linux kernel. STFC’s role in this EU funded collaboration has been to develop the virtual organisation management and security functions.

DL-FIND - a library for optimising geometries in atomic and molecular simulations. The DL-FIND software library is used by researchers who investigate the structures of chemicals and the detailed processes of chemical reactions. DL-FIND can be combined with the ChemShell computational chemistry environment, which provides facilities for combined quantum mechanical and molecular mechanical calculations. DL-FIND offers a variety of optimisation algorithms for common tasks, such as finding minimum energy structures or identifying transition states on a reaction path.

Partnerships

Can range from a one-off contract to truly integrated partnerships, collaborating with the Council’s staff.

Budget and Staffing

Budget for IT related areas: € 22 million

- 84% research council contracts
- 20% income from government departments, European Commission, universities and industry.

Around 2200 total staff, 180 IT staff (average whole-time equivalent).
**Leading institution in the field of information technology, computer science and control**

**SZTAKI** performs basic and application-oriented research in an interdisciplinary setting in the field of computer science, engineering, information technology, intelligent systems, process control, and wide-area networking. The Institute also conducts contract-based target research and development, and provides training and expertise for domestic and foreign academic, industrial, governmental and other partners.

**External relationships of the Institute**

The international reputation of the Institute is reflected in its prestigious title of “Centre of Excellence” in Information Technology, Computer Science and Control, given by the EU in 2000. It hosts the Hungarian office of the WWW consortium. Researchers of SZTAKI contribute extensively to European scientific co-operation projects. Some research programs are supported by US agencies, including NSF, AR0 and ONR.

**The main fields of research and development**

- Computer Science and Information Technology
- Applied Mathematics
- Automated Control Systems
- Artificial Intelligence
- Cellular Sensory and Wave Computing
- Intelligent Manufacturing Systems, Production Networks

**Staff**

- Researchers on payroll: 205
- Supporting staff: 93

**Budget**

- Total annual budget: 14 million euro
- Basic national funding: 34%
- Participation in (inter)national research programs: 66%

**VTT TECHNICAL RESEARCH CENTRE OF FINLAND**

**VTT** - the biggest multi-technological applied research organisation in Northern Europe

**Customer sectors**

- Biotechnology, pharmaceutical and food industries
- Electronics
- Energy
- ICT
- Real estate and construction
- Machines and vehicles
- Services and logistics
- Forest industry
- Process industry and environment

**Focus areas of research**

- Applied materials
- Bio- and chemical processes
- Energy
- Information and communication technologies
- Industrial systems management
- Microtechnologies and electronics
- Technology in the community
- Business research

**VTT’s operations**

- Research and Development
- Strategic Research
- Business Solutions
- Ventures
- Expert Services
- Corporate Services

**Address:**

1111 Budapest,
Kende u. 13-17.

**Mail address:**

1516 Budapest,
P.O.B. 63, Hungary

**Phone:**

+36 1 279 6000

**Fax:**

+36 1 466 7503

**Web:**

www.sztaki.hu
The scientific fields of competency of the ERCIM member institutes are categorised according to the classification of the American Mathematical Society (AMS) for the mathematics part and Association for Computing Machinery (ACM) for the informatics part.

The Web version of this table provides links to the research institutes and teams active in these fields.


### Mathematics

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<th>Field</th>
<th>AARIT</th>
<th>CICRs (IT)</th>
<th>ISTI</th>
<th>CRCIM</th>
<th>CWI</th>
<th>FhG ICT Group</th>
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The Web version of this table provides links to the research institutes and teams active in these fields.

Informatics

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