

Activity Report 2003/2004

3 Foreword from the President

4 About ERCIM

6 Events

- 6** ERCIM's 15th Anniversary Celebration
- 6** ERCIM Presidency: Keith Jeffery succeeds Stelios Orphanoudakis
- 6** Belgium and Spain joined ERCIM

8 Cooperations

- 8** ERCIM assesses the Future of ICT
- 9** EU-National Science Foundation Strategic Workshops
- 10** W3C, Europe and ERCIM
- 11** About the World Wide Web Consortium

12 Projects

- 13** CoreGRID: European Research Network on Foundations, Software Infrastructures and Applications for Large-Scale, Distributed Grid and Peer-to-Peer Technologies
- 14** DILIGENT: A Digital Library Infrastructure on Grid Enabled Technology
- 15** MUSCLE Network of Excellence: Approved and Poised to Embark on Ambitious Four-Year Research and Integration Programme
- 16** DELOS — A New Network of Excellence on Digital Libraries under FP6

17 Working Groups

- 18** Rapid Integration of Software Engineering Techniques
- 19** IM2IM – Informatics and Mathematics applied to Interventional Medicine
- 20** Software Evolution
- 21** Biomedical Informatics
- 22** Semantic Web Working Group

21 Fellowship Programme

22 Cor Baayen Award

- 24** Cor Baayen Award 2003 for Ronald de Wolf
- 25** Cor Baayen Award 2004 for Christof Teuscher

24 Events Sponsorship Programme

25 Publications

26 Members

36 Scientific Fields of Competence

Foreword from the President



2003-2004 has been a period of change for ERCIM. Gerard van Oortmerssen - who had been President for almost 6 years - moved from CWI to TNO (The Netherlands) and ended his term of office. He was succeeded at the start of 2004 by Stelios Orphanoudakis of FORTH (Greece). Unfortunately Stelios became unwell and - after hosting the excellent ERCIM 15th anniversary celebrations in Crete during May - resigned as President for health reasons in October. I was honoured to be nominated as acting President and subsequently to be elected in November as President for 2005-2006.

The world around us has also been changing quickly. Internationally GRIDS technology is coming of age alongside the established World Wide Web. With OGSA (Open GRID Services Architecture) a bridge between the technologies is perceived. ERCIM has been highly active and visible in both areas, particularly in research on semantics, and in trust and security. Work on digital libraries has seen the rise of open access repositories, and there have also been tremendous advances in mobile communications and devices, embedded systems technology, and systems and software development. In all of these areas, ERCIM researchers have been at the forefront. ERCIM scientists have also made advances in fundamental and applied mathematics, and in application areas they have been particularly active in image analysis/management, e-learning, medical and bio-informatics and environmental science.

The EC (European Commission) Framework 6 Programme has a large IT component; ERCIM researchers have been involved in developing the workprogramme through expert groups and invited meetings. ERCIM has been successful - both as an organisation and through its independent member institutions - in project and network participation. ERCIM researchers have been assisting the European Commission in Framework 7 preparatory workshops and expert groups and, at the suggestion of the EC, a Strategy document was prepared in late 2004.

The W3C (World Wide Web Consortium) host for Europe, Africa and the Middle East completed the move from INRIA to ERCIM in January 2003, opening up a range of opportunities for European industry, government, education and research utilising the network of W3C National Offices which are located mainly in ERCIM member institutions.

ERCIM has maintained an exciting series of workshops with our American partners through the EU-NSF (National Science Foundation) Strategic workshops. ERCIM has also been involved in initiatives to form R&D links with Central and South America. The ERCIM-based European W3C Office has established W3C Offices in Finland, Hungary and Spain. In the European Context there have been joint ERCIM- ESF (European Science Foundation) meetings and scientific cooperation in atmospheric physics. ERCIM, itself, has grown by welcoming new members from Belgium and Spain. Negotiations are underway with other applicant members as ERCIM intends to represent all European countries.

The ERCIM Fellowship programme continues to grow, providing a mobile human resource of post-doctoral researchers developed in a pan-European context. Mobility of researchers between ERCIM institutions also develops this resource. ERCIM is meeting the requirement for a mobile skilled ICT workforce to assist in the Lisbon targets ¹.

ERCIM News, published quarterly, has established itself as required reading throughout most European ICT (Information and Communication Technologies) organisations. Contributions - coordinated from each country through the ERCIM member institutes - come increasingly from academic, commercial, industrial and governmental communities as well as the ERCIM member institute. With each issue having a special theme, it constitutes a snapshot of European technology at that time, and over the years maps the development of those technologies. Back issues are continually in demand and readership of current issues is increasing rapidly.

ERCIM is a very exciting organisation with almost unlimited talent for R&D in Informatics and Mathematics. The researchers in the ERCIM institutes need and deserve the best opportunities to deploy their expertise for wealth creation and improvement of the quality of life both within Europe and worldwide. The ERCIM Board of Directors at their November 2004 meeting accepted my proposed new organisational structure for ERCIM. This will not only improve opportunities for participation in advanced R&D projects, improve the development of skilled ICT professionals in Europe and improve our communications with society at large, but will also harness the strategic skills and experience of the directors and others to enable ERCIM to play a vital role in the development of the European Research Area.

Informatics and Mathematics R&D is seen as a major contributor towards Europe reaching the Lisbon targets ¹. It is intended that the ERA (European Research Area) will couple national and European R&D programmes. ERCIM has national nodes that focus academic and commercial/industrial expertise on a local scale, and that are also linked together into a unique European organisation of excellence. Consequently, ERCIM is already configured to meet the ERA requirements, and we look forward enthusiastically to addressing future challenges.

Keith Jeffery

¹ Lisbon European Council 23-24 March 2000

About 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 eighteen 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 Technologies in Europe by:

- building a Europe-wide, open network of centres of excellence in Information and Communication Technologies (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 as a major representative organisation in its field, and 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

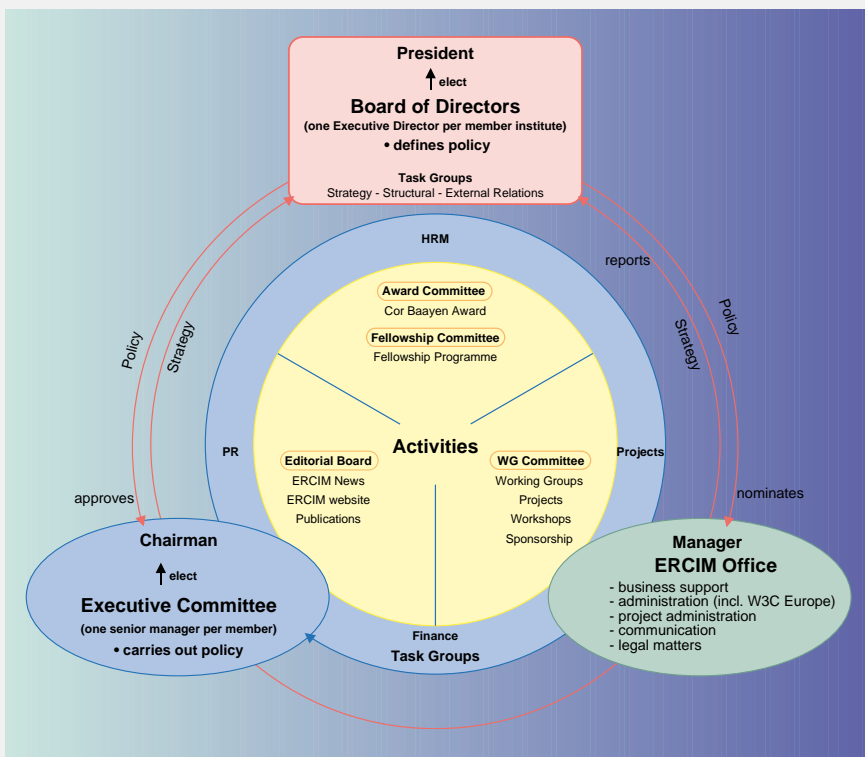
ERCIM considers it a high priority to develop cooperation with scientists all over the world. ERCIM hosts the European branch of the World Wide Web Consortium, participates in EU activities, and has established cooperations with both the European Science Foundation and the US National Science Foundation.

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. In January 2005 ERCIM had eighteen members. 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 size enterprises and large industrial companies.

Consultancy

ERCIM also undertakes studies and evaluations and offers consultancy services. ERCIM has carried out a number of studies for the European Commission, and organised joint European-American strategic workshops under the auspices of the European Commission and the US National Science Foundation in 2003/2004.



Organizational structure.

Institute	Board of Directors	Executive Committee
AARIT (Austria)	Günter Koch	Erwin Schoitsch
CCLRC (UK)	Keith Jeffery (President)	Michael Wilson
CNR (Italy)	Piero Maestrini	Costantino Thanos
CWI (The Netherlands)	Jan Karel Lenstra	Dick Broekhuis
CRCIM (Czech Republic)	Jiri Wiederman	Lubos Brim
FNR (Luxembourg)	Eric Dubois	Nicolas Guelfi
FNRS/FWO (Belgium)	Bart De Moor	Jean-Jacques Quisquater
FORTH (Greece)	Stelios Orphanoudakis	Constantine Stephanidis
FhG (Germany)	Ulrich Trottenberg	Eckart Bierdämpel
INRIA (France)	Gilles Kahn	Jean-Pierre Banâtre
Irish Universities Consortium (Ireland)	Heather Ruskin	Mark Roantree
NTNU (Norway)	Arne Solvberg (Vice President)	Finn Arve Aagesen
SARIT (Switzerland)	Daniel Thalmann	Patrick Furrer
SICS (Sweden)	Gunnar Bjurel	Janusz Launberg
SpaRCIM (Spain)	Juan José Moreno	Ernesto Pimentel
SRCIM (Slovakia)	Branislav Rován	Peter Vojtas
SZTAKI (Hungary)	Péter Inzelt	László Monostori
VTT (Finland)	Pekka Silvennoinen (Vice President)	Seppo Linnainmaa

ERCIM representatives (January 2005).

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 associated partner. In these projects, several member institutes carry out the research while the ERCIM office takes care of administrative tasks. In 2003/2004, ERCIM was involved in ten projects supported by the European Commission.

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. These Working Groups are also the focus of the ERCIM fellowship programme. Working Groups have been created in areas such as Applications of Numerical Mathematics in Science, Biomedical Informatics, Constraints, Control and System Theory, E-Learning, Dependable Software-Intensive Systems, Environmental Modelling, Formal Methods for Industrial Critical Systems, Image and Video Understanding, IT and Mathematics applied to Interventional Medicine, Matrix Computations and Statistics, Rapid Integration of Software Engineering Techniques, Semantic Web, Soft Computing, Software Evolution, and User Interfaces for All.

Technology Transfer

In addition to basic and applied research in computer science and mathematics, the transfer of research results is one of the ERCIM institutes' current main assignments. In the last few 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. ERCIM members have spawned over one hundred companies. In addition, ERCIM members have a long track record of cooperation with European industry in R&D projects, generally within the framework of European programs. As a network, ERCIM facilitates industrial partners to locate the best scientific teams in Europe for a given domain.

Publications

ERCIM publishes the quarterly newsletter 'ERCIM News', workshop proceedings and policy documents.

ERCIM Office Staff

Michel Cosnard, INRIA, Manager

Bruno Le Dantec, Deputy Manager

Peter Kunz, Central Editor

Remi Ronchard, Project Administrator

Jessica Michel, Project Administrator

Emma Lière, Assistant

Céline Bitoune, Assitant

ERCIM runs an office in Sophia Antipolis, France. The office takes care of ERCIM's day-to-day business such as project administration, communication, legal matters, etc. The office is headed by the ERCIM Manager who is the valid representative of ERCIM vis-a-vis third parties. He is responsible for ensuring that the implementation of ERCIM's general policy is within the framework specified by the membership. The Manager administers the budget.

ERCIM's 15th Anniversary Celebration

ERCIM celebrated fifteen years (1989-2004) of cooperation in research, technology transfer, innovation and training. More than 150 people, including representatives from ERCIM institutes and invited guests from academic and research institutions, as well as from the European Commission, gathered in Crete, Greece on 26 May 2004 to commemorate the ERCIM accomplishments.

During the 15th ERCIM anniversary event, the President of ERCIM, Stelios Orphanoudakis (Director and Chairman of the Board of FORTH, Greece) gave an introductory presentation, 'ERCIM as a model for collaboration', which stressed the importance of expanding existing collaborations and taking on new challenges. The presentation included a brief history of ERCIM and the opportunities offered to young researchers, such as the Cor Baayen Award and the Fellowship Programme.

Cor Baayen and Gerhard Seegmueller, two of the three founding fathers of ERCIM, shared their early steps and experiences towards the implementation of their vision for a European research community, favouring close collaboration and mobility of researchers. Alain Bensoussan, the third founding father had expressed his deep regrets that he was not able to attend.

Invited representatives of the European Commission, Gerard Comyn, Head of Unit, ICT for Health, and Thierry van der Pyl, Head of Unit, Future and Emerging Technologies congratulated ERCIM for its significant achievements and expressed their support for its continuing efforts towards European R&D excellence.

Keith Jeffery (CCLRC, UK) presented the achievements of ERCIM and its growth over the 15 year-period, and finally, Andreas Rauber (Vienna University of Technology, Austria) Cor Baayen award winner 2002, referred to the benefits of such an award on both a professional and a personal level.



The ERCIM 15th Anniversary cake was cut during the Gala Dinner. From left: Stelios Orphanoudakis, Gerhard Seegmüller and Cor Baayen.

ERCIM Presidency: Keith Jeffery succeeds Stelios Orphanoudakis

The Board of Directors of ERCIM – the European Research Consortium for Informatics and Mathematics elected Professor Keith Jeffery as President at their November 2004 meeting to lead their 12,000 researchers for the next two years.

In October 2004, Stelios Orphanoudakis resigned for health reasons and Keith Jeffery was nominated as acting president. His elected term of office started in January 2005. Keith is Director of IT for the Council for the Central Laboratory of the Research Councils (CCLRC) in the UK, based at the CCLRC Rutherford Appleton Laboratory near Oxford, but also responsible for staff at the CCLRC Daresbury Laboratory near Liverpool.

Keith is keen to foster strategic relationships with other appropriate organisations both in Europe (eg with European Science Foundation - ESF) and internationally (eg National Science Foundation in the USA - NSF). Finally, he wishes to ensure that the European interest in the World Wide Web Consortium (W3C) hosted by ERCIM continues to provide not only assistance in the use of the technology for wealth creation and improvement in the quality of life, but also to provide new initiatives to meet the vision for the Web as articulated by its director, Sir Tim Berners-Lee.

Although delighted to be elected president, Keith is saddened by the circumstances through which this opportunity arose. He is joined by all directors in wishing Stelios a rapid recovery and a rapid return to participation in ERCIM. The latest process of change in ERCIM initiated by Professor Orphanoudakis is being continued under the new presidency.

Belgium and Spain joined ERCIM

SparCRIM

SpaRCIM, the Spanish Research Consortium for Informatics and Mathematics, joined ERCIM on 1st July 2003.

The SpaRCIM consortium was founded under the auspices of the Spanish Ministry of Science and Technology (MCYT). Its main goal is to spread the activities of the ERCIM consortium to the informatics and mathematics research communities within Spain. The consortium is composed of five universities and a research institute dependent on the Spanish Research Council (CSIC):

- Artificial Intelligence Research Institute (IIIA)
- University of Malaga (UMA)
- Technical University of Catalonia (UPC)
- Technical University of Madrid (UPM)
- Technical University of Valencia (UPV)
- Rey Juan Carlos University (URJC).

These institutions include a number of groups that are considered to be representative of Spanish research in computer science. These groups are working on a great variety of research areas within information technology and applied mathematics. These institutions already collaborate in a number of European networks and projects such as NAME, CoLogNet, AgentLink and PROENBIS. They also collaborate in a number of national networks and projects funded by the Spanish Ministry of Science and Technology (MCYT), and have founded a number of spin-off companies. The consortium is open to other Spanish institutions.

Juan José Moreno from the Technical University of Madrid and the Spanish Ministry of Science and Technology is heading the ERCIM activities at SpaRCIM. Prof. Ernesto Pimentel from the University of Malaga (UMA) is the corresponding member of ERCIM's Executive Committee.

<http://www.sparcim.org>

FWO/FNRS

Belgium is officially part of ERCIM since January 2004. After a decade of effort, this finally closes the curious 'hole' in ERCIM's map of Europe.

Research in Belgium is mainly concentrated in universities, which are responsible for both education and research. While there are a few specialized research centers, such as CETIC (Centre d'Excellence en Technologies de l'Information et de la Communication) and IMEC (Interuniversity MicroElectronics Center), there are no truly general centers similar to CWI, SICS, or INRIA, and nothing similar to the 'grandes écoles' in France. The universities are organized independently by the French and Flemish communities. Research is coordinated by the FNRS (Fonds National de la Recherche Scientifique) for the French community and the FWO (Fonds voor Wetenschappelijk Onderzoek) for the Flemish community.

The Belgian membership is jointly sponsored by FWO and FNRS. This enables all Belgian research institutions to participate fully in ERCIM activities. The FWO has designated Bart De Moor of the Katholieke Universiteit Leuven as Belgian member of the Board of Directors. Jean-Jacques Quisquater of the Université catholique de Louvain represents FWO/FNRS in the ERCIM Executive Committee.

<http://www.fnrs.be>

<http://www.fwo.be>





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, participates in EU activities, has established contacts in Latin America and cooperations with both the European Science Foundation and the US National Science Foundation.

The European Commission has been planning for several years to move towards a European Research Area (ERA) to overcome the problem that the European centres of excellence are scattered across the continent and all too often their efforts fail to add up in the absence of adequate networking and cooperation. The ERA will be a research and innovation equivalent of the 'common market' for goods and services brought about by regrouping all Community supports for the better coordination of research activities and the convergence of research and innovation policies, at national and EU levels.

In order to foster the networking and cooperation required by the ERA pan-European research organisations are required that persist longer than individual projects or research programmes. ERCIM is such an organisation that aims to foster collaborative work within the European research community and to increase co-operation with European industry. ERCIM is legally established as a European Economic Interest Group (EEIG). An

EEIG can be considered as a joint venture endowed with legal capacity across the countries of Europe. One of the characteristics of an EEIG is its ancillary role relative to its members, in that the EEIG does not undertake the activities of its members, but activities that are ancillary to them. Therefore ERCIM centrally does not undertake research itself, but ancillary activities addressing co-operation, strategic planning, and technology transfer.

In planning the Information Society Technologies (IST) programme, the European Commission Directorate-General for "Information Society" takes advice and guidance from many sources. One of the standing bodies which is available to the European Commission for consultation on the IST programme is the IST Advisory Group (ISTAG). In the context of building an IST European Research Area, a key role of ISTAG is to reflect and advise on the definition and implementation of a coherent research policy in Europe. This policy should ensure

ERCIM assesses the Future of ICT

'Strategy for ICT in Europe' is the title of the report produced by ERCIM on the suggestion of European Commission officials in November 2004. The report assesses the future of research and

development in information and communication technologies (ICT) in Europe and is intended to serve as a basis for consultations on future framework programmes.

Some technologies that rely heavily on connectivity have already been widely adopted: the rapid development of mobile phones and their various features may be the most omnipresent example. But in the next 10 years, ERCIM foresees 'smart dust' that senses where you are and sends information about it to the network of your choice, virtual reality that allows you to hold meetings with co-workers around the globe, GRIDs with self-repairing, self-managing properties that allow the seamless networking of datastores and computers across Europe, and automated programs that check code for flaws and security problems as the code is being written.

This almost overwhelming landscape of opportunities raises the obvious question: how can European investment, both by government and industry, best be targeted so that Europe finds its niche in the information world? Existing abilities and limitations

will be critical in deciding where best to put research money, the report states.

We have to consider both our ability to build the systems that are needed to create the good society and products that have the potential of financing the desired society, the ERCIM report says.

Universities are clearly key players in crafting this new landscape – and as such must provide their students with the best possible knowledge and tools. Graduates are critical in reducing the 'time gap' between the creation of new knowledge through research and the infiltration of new knowledge into industry, public administration and society at large. The report also sees the importance of forming research consortia in partnership with industry, where well-financed basic research helps fuel overall business growth.

The report looks at three aspects of future and developing ICT:

- user- and system-centric components, including connectedness, for architected application systems
- electronic, storage, computing and communication components to support these user and system centric components
- system development methods to construct components for user- and system-centric components, and applications for these components.

Full report in pdf:

http://www.ercim.org/publication/policy/ERCIM_IT_Strategy_2004.pdf

or in html:

http://www.ntnu.no/ikt/ercim_summary/



EU-NSF Strategic Research Workshops

the mastering of technology and its applications and should help strengthen industrial competitiveness and address the main societal challenges. ISTAG members are appointed as individuals rather than to explicitly represent the interests of a single group. ISTAG has a Chairman and 30 members. Among these individuals two are members of ERCIM institutes: the chairman José L. Encarnação of the Fraunhofer ICT Group in Germany and Michael Wilson, CCLRC, Rutherford Appleton Laboratory, UK.

ERCIM's main activities are intended to foster co-operation between researchers in the member institutes, and more widely, between researchers in the countries that they represent.

ERCIM has also established official relationships with other bodies including the National Science Foundation in the USA, and the European Science Foundation to develop a common research strategy for the Informatics and Mathematics area. One of the main instruments for this development is a series of joint NSF-EU workshops whose reports are widely distributed to research funding bodies and research policy makers.

Perhaps the most important current topic is the future European information infrastructure itself. Many of the ERCIM member institutes established their country's original digital research networks which have subsequently been passed to commercial management. They are now concerned with the development of the next generation of infrastructure. Three technologies are under development: Web Services, the next generation GRID and the Semantic Web. These have been promoted as three visions supported by three different technologies. ERCIM institutes are active in research in all three. Current results show that the technologies are converging to become a single interdependent technology where the GRID incorporates the Open GRID Services Architecture built on Web Services, while the rich machine understandable descriptions required to support the Semantic Web are being included in both Web Services and the GRID in order to provide not only descriptions of services themselves but also the quality measures and constraints required on those services for them to be usable in practice by business.

To further the development and adoption of these technologies ERCIM took over the role of European host organisation for

ERCIM has organised a series of strategic research workshops under the auspices of the European Commission's Information Society Technology Programme (Future and Emerging Technology Activity) and the US National Science Foundation (Directorate for Computer and Information Science and Engineering).

These workshops have been set up to identify key research challenges and opportunities in information technology. On the European side, ERCIM was assigned to solicit ideas for high-level workshops from the European IT scientific community and to then organise those workshops. A strategic workshop review committee selected the areas for joint research initiatives according to the following criteria:

- long-term/high-risk nature of the research involved, justifying risk-sharing at an international level
- high potential payoffs in both the EU and the US that would make up for the long-term/high-risk nature of the research
- existence of sufficient scientific and technological bases in both the US and the EU to support balanced research efforts.

In the period 2003-2004 ERCIM has (co-)organised the following workshops:

- The Disappearing Computer, Vienna, Austria 23-24 April 2004
- Software-Intensive Systems, Edinburg, Scotland, 22-23 May 2004
- Unconventional Programming Paradigms, Mont Saint-Michel, France, 15-17 September 2004.

The workshop reports have been published by ERCIM.

<http://www.ercim.org/EU-NSF/>

the World Wide Web Consortium (W3C) from one of its member institutes INRIA in France in January 2003. The W3C was created to lead the Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability. It is an international industry consortium jointly run by the MIT Laboratory for Computer Science (MIT LCS) in the USA, Keio University in Japan and now ERCIM in Europe. W3C is leading the implementation of the Semantic Web vision and the standardization of Web Services Technologies. Services provided by the Consortium include: a repository of information about the World Wide Web for developers and users, and various prototype and sample applications to demonstrate use of new technology. To date, nearly 450 organizations are members of the consortium.

The creation of the ERA will be led by the European Commission through actions in the 6th and 7th Framework Programmes. But to ensure that it becomes a practical reality pan-European institutions will be required in many research disciplines. ERCIM may be seen as one example of such an institution where its legal status, choice of activities and links to other organisations could be seen as a model for other disciplines to follow.

W3C, Europe and ERCIM



Photo: Ralph R. Swick, W3C

The World Wide Web Consortium (W3C) marked its tenth anniversary with a symposium on 1 December in Boston, Massachusetts, USA. Cutting the anniversary cake. From left to right: Tim Berners-Lee, Jim Bell, Bob Metcalfe, Michel Cosnard, Nobuo Saito and Steve Bratt.



Participants of the First Italian Semantic Web Workshop, 10th December 2004, Ancona, Italy, co-organised by the Italian W3C Office at ISTI-CNR.



W3C Spanish Office organizes its first "W3C Standards Tour" around different Universities in Spain from 3 to 26 November 2004.

The change of the W3C European Host from INRIA to ERCIM took place in January 2003 with the aim to strengthen research relationships throughout Europe to better support Web technology development. ERCIM and W3C are now jointly sharing the results of their collaboration.

At the time of the move, INRIA already provided the necessary foundations for European involvement in Web infrastructure development and ERCIM institutes were already the home of a network of W3C Offices in Europe. Today, seven of the nine existing European W3C Offices are based at ERCIM Institutes, including CWI (Benelux); Fraunhofer IMK (Germany and Austria); FORTH (Greece); SZTAKI (Hungary); CNR (Italy); SICS (Sweden) and CCLRC (UK and Ireland). W3C Offices in Europe work with their regional Web communities to promote W3C technologies in local languages, broaden W3C's geographical base, and encourage international participation in W3C Activities.

As a consortium of 18 members from as many European countries, ERCIM creates a balance between European diversity and necessary homogeneity by building bridges between different cultures and stimulating technical ideas to move freely within academia and across borders. W3C is very heavily swayed by its members, several of them having sectoral interests in the Web (such as multimedia, Semantic Web, graphics, Web services, etc.), whereas ERCIM jointly has a very wide-spread interest in many research fields where the Web standards are seldomly used. ERCIM then helps to gather those Web communities and make them work together.

This organisational change has the potential to strengthen W3C's research relationships throughout the European academic community. 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 the European industry which can broaden its participation in the making of the standards. Hosting the W3C is also benefi-

cial to ERCIM and its members. It allows ERCIM to benefit from the know-how and expertise of the W3C team. And there is also W3C's reputation, which reflects on ERCIM and increases its visibility. One of the challenges now is to prepare joint research projects with ERCIM institutes and W3C Europe. These initiatives will pave the way towards the emergence of future Web technologies across Europe and worldwide.

Recent Results

The main achievements of W3C during the last two years include the following:

- Documenting the Web: as the Web continues to grow on an unprecedented scale, new generations of developers need to have a concise reference to the important design concepts. "Volume One of the Web Architecture" significantly advances the state of the art, documenting long-established principles which are well understood and proven in use.
- Enabling a wide range of applications growing from the new Semantic Web standards OWL and RDF: the Semantic Web is made through incremental changes, by bringing machine-readable descriptions to the data and documents already on the Web. XML, RDF and OWL enable the Web to be a global infrastructure for sharing both documents and data, which make searching and reusing information easier and more reliable as well.
- Advancing internationalization: the completion of the Character Model for the World Wide Web facilitates the use of the Web by all people, regardless of their language, script, writing system, and cultural conventions, in accordance with the W3C goal of universal access.
- Giving voice to the Web: aimed at the world's estimated two billion fixed line and mobile phones, W3C's Speech

About the World Wide Web Consortium

The World Wide Web Consortium (W3C) is an international consortium where Member organizations, 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."

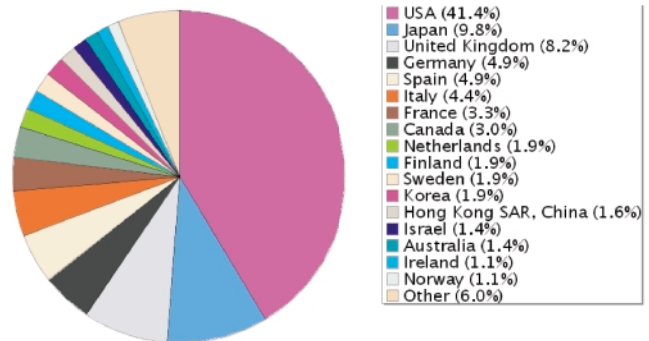
W3C Develops Web Standards and Guidelines

W3C primarily pursues its mission through the creation of Web standards and guidelines. In its first ten years, W3C published more than eighty 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

Organizations 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 its contributions to the Web. W3C Members, staff, and invited experts work together to design technologies to ensure that the Web will continue to thrive



W3C Membership distribution by country

in the future, accommodating the growing diversity of people, hardware, and software. W3C's global initiatives also include nurturing liaisons with over forty national, regional and international organizations 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 Europe

ERCIM is the European host of W3C. The number of European W3C Members is 141 (out of 361). The W3C Team includes 69 people working from locations across the globe, 21 are employed by ERCIM (all figures for January 2005).

European W3C Offices

The mission of a W3C Office is to promote adoption of W3C Recommendations among developers, application builders, and standards setters, and to encourage inclusion of stakeholder organizations in the creation of future recommendations by joining W3C. W3C has currently nine offices in Europe, seven are hosted by ERCIM member institutes. Specifically, the W3C Offices helped organize meetings and workshops (on topics such as Semantic Web, Web Services and the Mobile Web) as well as taking part in bigger projects for the past 3 years such as:

- W3C Interop Tour 2002 (throughout Europe)
- W3C Semantic Tour 2003 (throughout Europe)
- W3C Standards Tour 2004 (in Spain)

Interface Framework, including VoiceXML 2.0 and SRGS, will allow an unprecedented number of people to use any telephone to interact with appropriately designed Web-based services via key pads, spoken commands, listening to pre-recorded speech, synthetic speech and music.

- Allowing richer Web interaction with XForms: it is now easy for implementors to develop and reuse form components, integrate them into Web services, and deliver functionality to users and devices previously not possible.
- Providing a solid and reliable foundation for Web services: With SOAP 1.2, customers and developers alike benefit from an XML-based Web services protocol that powers the full range of applications and Web technologies they can imagine using.
- Bringing vector graphics to handheld devices: currently widely deployed Mobile SVG makes it possible to send colorful animated messages and to consult up to date, interactive and informative graphics.

Future Activities

W3C continues to expand the reach of the Web to:

- Everyone (regardless of culture, abilities, etc.)
- Everything (applications and data stores, and on devices ranging from power computers with high-definition displays to mobile devices to appliances)
- Everywhere (from high to low bandwidth environments)
- Diverse modes of interaction (touch, pen, mouse, voice, assistive technologies, computer to computer)
- Enable computers to do more useful work (through advanced data searching and sharing).

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.

ERCIM is participating in several research projects as coordinator or partner. In these projects ERCIM institutes and their partners carry out the research while the ERCIM office takes care of administrative tasks.

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. The management of common research projects has become an important activity in achieving this goal, and the ERCIM office is dedicating considerable effort to its project management activities. With a small team of experts, the office is able to help institutes in identifying opportunities for funding, developing project ideas, finding project partners, writing proposals, contract negotiation and project management. ERCIM has been involved in some thirty European projects, including RTD projects, Thematic Networks and Accompanying Measures, either as coordinator or as a full partner. In these projects, the ERCIM office takes care of the financial and administrative tasks. This distribution of work has been a valuable asset, allowing the research institutes and other partners to focus on the scientific tasks at the core of the project.

Projects with the Participation of ERCIM in 2003/2004

CoreGRID - European Research Network on Foundations, Software Infrastructures and Applications for large scale distributed, GRID and Peer-to-Peer Technologies

The CoreGRID network aims at building a European-wide research laboratory that will achieve scientific and technological excellence in the domain of large scale distributed, GRID and Peer-to-Peer computing.

Budget: 8 200 000 Euro

Supported by: European Commission, FP6 IST Programme

Duration: September 2004 - August 2008

CYCLADES - An Open Collaborative Virtual Archive Service Environment

CYCLADES has developed an open collaborative virtual archive service environment supporting both single scholars as well as scholarly communities in carrying out their work.

Budget: 2 151 523 Euro

Supported by: European Commission, IST Programme

Duration: February 2001 - July 2003

DELOS - Network of Excellence on Digital Libraries

The DELOS Network of Excellence for Digital Libraries provides an open context in which an international research agenda for future research activities in the digital libraries domain can be developed.

Budget: 6 000 000 Euro

Supported by: European Commission, FP6 IST Programme

Duration: January 2004 - December 2007

DILIGENT - A Digital Library Infrastructure on GRID Enabled Technology

The DILIGENT project is creating an advanced test-bed that will allow virtual e-Science communities to share knowledge and collaborate in a secure, coordinated, dynamic and cost-effective way..

Budget: 8 900 000 Euro

Supported by: European Commission, FP6 IST Programme

Duration: September 2004 - August 2007

EU-US Collaboration - Joint Strategic Workshops

ERCIM has organised a series of strategic research workshops under the auspices of the European Commission and the US National Science Foundation to identify key research challenges and opportunities in Information Technology.

Budget: 495 000 Euro

Supported by: European Commission, IST Programme

Duration: January 2000 - December 2004

MUSCLE - Multimedia Understanding through Semantics, Computation and Learning

MUSCLE aims at creating and supporting a pan-European Network of Excellence to foster close collaboration between research groups in multimedia datamining and machine learning.

Budget: 6 900 000 Euro

Supported by: European Commission, FP6 IST Programme

Duration: March 2004 - February 2008

RESET - Roadmap on European Research for Smartcard Technologies - A Thematic Network

RESET investigated the RTD needs corresponding to current and expected future technology gaps, identified by the industry and resulting from market and product trends foreseen by smart card industrial users.

Budget: 225 000 Euro

Supported by: European Commission, IST Programme

Duration: September 2002 - May 2003

TELEMAC - Telemonitoring and Advanced Telecontrol of High Yield Wastewater Treatment Plants

TELEMAC designed a reliable modular system based on anaerobic digestion, which supports remote monitoring and control of wastewater treatment units without the need for local expertise.

Budget: 4 596 651 Euro

Supported by: European Commission, IST Programme

Duration: September 2001 - August 2004

WADI - Water Supply Watershed Planning and Management: an Integrated Approach

The WADI project developed a decision support system for rational planning, operation and management of specific watersheds.

Budget: 1 489 042 Euro

Supported by: European Commission, INCO-MED Programme

Duration: April 2001 - March 2004

<http://www.ercim.org/activity/projects/>

CoreGRID: European Research Network on Foundations, Software Infrastructures and Applications for Large-Scale, Distributed GRID and Peer-to-Peer Technologies

The CoreGRID Network of Excellence in the area of GRID and Peer-to-Peer technologies commenced on 1 September 2004. The network will allow European researchers to carry out a joint program of activities at an unprecedented level with the aim of developing next-generation GRID middleware.

The CoreGRID Network of Excellence aims at strengthening and advancing scientific and technological excellence in the area of GRID and Peer-to-Peer technologies. It is funded by the European Commission through a grant of 8.2 million Euro for a duration of four years. To achieve its objective, the Network brings together a critical mass of well-established researchers (119 permanent researchers and 165 PhD students) from 42 institutions — several of which belong to ERCIM — who have constructed an ambitious joint program of activities. This joint program of activity is structured around six complementary research areas that have been selected on the basis of their strategic importance, research challenges and existing European expertise to develop next-generation GRID middleware.

Virtual Institutes

To ensure progressive evolution and durable integration, the Network is operated as a European Research Laboratory — known as the CoreGRID Research Laboratory — having six institutes. Each of them is dedicated to the particular domain identified as of strategic importance to ensure a durable development and deployment of GRID infrastructures:

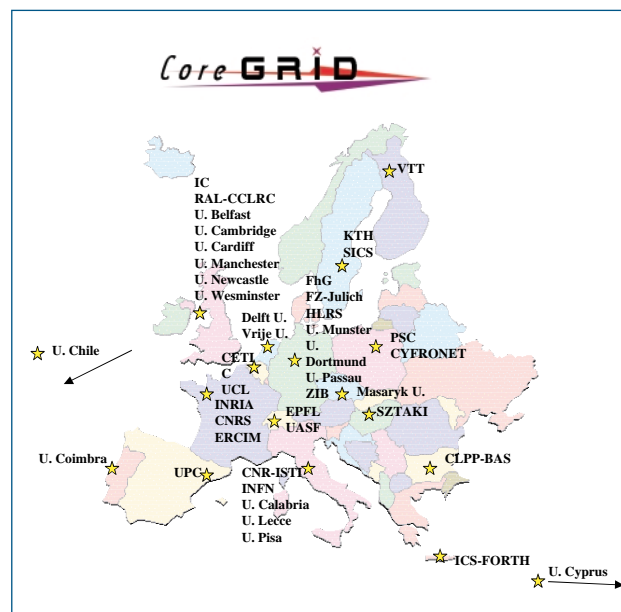
- Institute on Knowledge and Data Management
- Institute on Programming Model
- Institute on System Architecture
- Institute on GRID Information and Monitoring Services (WP5)
- Institute on Resource Management and Scheduling
- Institute on Problem Solving Environment, Tools and GRID Systems.

The network is thus committed to setting up this Laboratory and making it internationally recognised and sustainable. It is

funded by a European grant that is assigned to the CoreGRID NoE for a duration of four years to cover the integration costs, while the network partners cover the expense required to perform the research associated with the joint program of activities. Integration is achieved by the joint execution of research projects operated through research groups within the six institutes, the sharing of a common GRID testbed

To guarantee that the expertise and the knowledge gained by Network participants will be of mutual benefit to the European GRID community (both academic and industrial), CoreGRID will organize a set of activities to spread excellence outside the Network. A public Web site is an essential mechanism for the international GRID community to present the Network as a Research Laboratory. A set of

CoreGRID publications can be accessed thanks to this Web site (technical reports, network brochure and newsletters). The Network will organize a set of thematic workshops and conferences on an annual basis. Training activities are organized to ensure that CoreGRID is a leading educational source in Europe in GRID and Peer-to-Peer technologies. A dedicated activity under the form of an Industrial Advisory Board will target mainly industry and commerce to ensure a strong interaction and involvement.



CoreGRID partners.

for research assessment, the access to a common communication infrastructure to ensure collaboration and dissemination, and a coherent management framework to encourage mobility of senior and post-doctoral researchers and PhD students. In addition to these classical integration activities, the network has a proactive role to increase the awareness of trust and security technologies among the network participants.

Finally, CoreGRID is committed to participating in collaboration activities that can benefit the other EC GRID projects. In particular, it will take on a leadership role in the organization of training activities and will collaborate on EU GRID roadmaps, research inventories and the establishment of a repository of reference implementations and GRID middleware.

<http://www.coregrid.net>

DILIGENT: A Digital Library Infrastructure on GRID Enabled Technology

Building on the results of its past activity in both the GRID and Digital Library domains, ERCIM has provided the framework for the setting up of an innovative 'Integrated Project', DILIGENT. This project, which is coordinated scientifically by ISTI-CNR, involves 14 European partners

and a number of international observers. They will work together on the development of a digital library infrastructure, based on GRID-enabled technology, that will allow members of dynamic virtual organizations to collaborate by exploiting shared knowledge and physical resources.

Research work today is often a collaborative effort carried out by groups of individuals belonging to different organizations remotely spread worldwide. Motivated by a common goal and funding opportunities, these groups dynamically aggregate into virtual organizations (VOs) that share their resources eg knowledge, experimental results, instruments, etc., for the duration of their collaboration, creating a rich and powerful research environment.

The DILIGENT project aims at supporting this new research operational mode by creating an advanced knowledge infrastructure that will serve the needs of dynamic virtual organizations. This infrastructure will allow members of VOs to access shared knowledge, services and computational resources in a secure, coordinated, and cost-effective way.

DILIGENT will be built by integrating GRID and Digital Library (DL) technologies. The merging of these two different technologies will result in an innovative level of functionality providing the foundations for next generation collaboration environments able to serve many different research and industrial applications.

In particular, the GRID framework will provide the context for implementing the notion of virtual digital libraries (VDLs), ie transient, on-demand DLs based on shared computational, multimedia and multi-type resources. The DILIGENT infrastructure will maintain a network of existing resources on the GRID. A virtual organization will be enabled to dynamically create and modify its own DL by specifying a number of requirements on the information space (eg publishing institutions, content domain, document type, level of replication) and on the services (eg service type, configuration, lifetime, availability, response

time). A reliable and secure virtual DL that satisfies the given requirements will be transparently instantiated and made accessible to authorized users through a portal. Many virtual DLs, serving different user communities, will be active on the same shared GRID resources at the same time. The composition of a DL will be dynamic since it will depend on the currently available and registered DL resources and on many other quality parameters such as usage workload, connectivity, etc. This development model will make it possible to avoid heavy investments, long delays and radical changes in the organizations setting up these applications, thus fostering a broader use of DLs as means for communication and collaboration.

The GRID framework will also enable the provision of a number of new functions whose implementation has until now been limited by their high cost in terms of computational, storage and data transfer capacity, such as multimedia document and geographic information processing, 3D handling, spatial data manipulation, etc.

From the technical point of view, DILIGENT will exploit the results of the EGEE (Enabling GRIDS for E-science in Europe (<http://public.eu-egee.org/>) project, which, in the next two years, will deliver a GRID production infrastructure shared by a very large number of European organizations. DILIGENT will first enrich this infrastructure with the necessary features for creating and handling an open and 'on-the-fly' modifiable set of services as required by the DL application framework. It will then add a number of specific services for:

- providing access to content sources, such as archives, metadata repositories and databases
- implementing typical DL functions, like search, annotation, personalization, document visualization

- supporting existing applications implemented by third-parties, like video summarization, reports generation, media-specific similarity search, etc.

The DILIGENT test-bed will be demonstrated and validated by two complementary real-life application scenarios: one from the environmental e-Science domain and the other from the cultural heritage domain. The user community of the first scenario is composed by representatives of leading organizations that operate in the environmental sector. DILIGENT will be used experimentally as a means for supporting two of the typical activities of this community: the organization of conferences and the preparation of projects and periodical reports on specific environmental topics of concern. We expect that DILIGENT will facilitate the achievement of the goals of these activities and will enhance the quality of their results by improving accessibility, interoperability and usability of environmental data, models, tools, algorithms and instruments and by integrating the located data sources with specialized data handling services.

<http://www.diligentproject.org>

MUSCLE Network of Excellence: Approved and Poised to Embark on Ambitious Four-Year Research and Integration Programme

The European Commission signed the contract for the FP6 Network of Excellence MUSCLE (Multimedia Understanding through Semantics, Computation and Learning) on 23 February 2004, thereby giving this ERCIM-led consortium of 42 scientific groups the final go-ahead to embark on an ambitious four-year research and integration program.

As the Network's expanded acronym indicates, MUSCLE aims to facilitate high-level access to multimedia databases by systematically incorporating machine learning into an integrated approach to multimedia data mining. The original impetus for this initiative stems from the realisation that we urgently need new tools to intelligently index and explore the vast quantities of multimedia documents currently being amassed. As the enormous size of these collections precludes comprehensive human annotation, the only viable alternative is the development of reliable machine perception and understanding, and in particular, the automatic creation of semantically rich metadata that can be used as input for subsequent high-level processing. Indeed, enriching multimedia databases with additional layers of automatically generated semantic meta-data, as well as the artificial intelligence to reason about these (meta)data, seems the way forward in mining for complex content, and it is at this level that MUSCLE will focus its main effort. This will enable users to move away from labour-intensive, case-by-case modelling of individual applications, and allow them to take full advantage of generic adaptive and self-learning solutions that need minimal supervision.

The scientific work has been divided up into workpackages (WP), which collectively constitute the Joint Program of Activities (JPA). Each WP covers a different but complementary component in the overall research strategy. The Single Modality WP groups together all the research that is restricted to a single sensor modality (ie audio, video, speech). This well-established approach is augmented by the work done in the Cross-Modal Integration WP, where the focus is on performance improvement that can be achieved by combining different but synergistic modalities. For instance, visual interpretation of a sports

video can be improved by taking into account the accompanying audio stream (eg crowd cheering). The WP on Machine Learning addresses the possibility of learning data-models automatically instead of having to hand-code them. A typical application would be the automatic classification of music into classical or modern based on a number of illustrative examples. The WP on Computation Intensive Methods investigates how sophisticated computational techniques can assist in exploring complicated models or estimating uncertainty. Using numerical simulation to determine parameter confidence intervals is a case in point. Finally, the WP on Human Computer Interfaces looks at the role of human computer interfaces in the exploration or visualisation of complex datasets, while the Meta-Data Representation WP concerns itself with the internal representation of acquired information.

Two Grand Challenges

To encourage close coordination of effort and durable scientific integration, MUSCLE will set itself two 'Grand Challenges'. These are ambitious research projects that involve the entire spectrum of expertise represented within the consortium and as such, will act as focal points. The first challenge addresses natural high-level interaction with multimedia databases. This project will work on querying of multimedia databases at a high semantic level. Think Ask Jeeves for multimedia content: one can address a search engine using natural language and it will take appropriate action, or at least ask intelligent, clarifying questions. This is an extremely complicated problem and will involve a wide range of techniques: natural language processing, interfacing technology, learning and inferencing, merging of different modalities, federation of complex meta-data, appropriate representation and interfaces and so on.

The second challenge is more related to machine perception and addresses the problem of detecting and recognising humans and their behaviour in videos. At first glance, this might seem rather narrow but it has become clear that robust performance will rely heavily on the integration of various complementary modalities such as vision, audio and speech. Applications are legion: surveillance and intrusion detection, face recognition and registration of emotion or affect and automatic analysis of sports videos and movies, to name just a few.

The research plans outlined above cover only part of the MUSCLE mission. In addition, strong emphasis will be placed on networking and dissemination, as the European Commission intends NoEs to be important players in a Europe-wide drive towards durable integration and collaboration. To this end, MUSCLE has planned a number of initiatives. First, there will be an annual post-doctoral fellowship scheme extending and complementing the ERCIM model. As is the case for the latter, applications will be open to talented young researchers from across the globe. The consortium will also set up a Web-based infrastructure to facilitate electronic collaboration between different teams and support access to multimedia databases for benchmarking or testing purposes. In the same vein, MUSCLE will host a multimedia preprint server, offering authors the opportunity to publish their research results in media-rich format, which will do better justice to the content. Input from industrial and commercial parties will be solicited through the setting up of an Application Forum. Finally, in order to maximise its impact on the European and global research scenes, MUSCLE will pool resources with other Networks and Integrated Projects active in the area of Semantic-based Knowledge Systems.

<http://www.muscle-noe.org>

DELOS — A New Network of Excellence on Digital Libraries under FP6

A new Network of Excellence for Digital Libraries, known as DELOS, has been launched by the European Commission under the Sixth Framework Programme. DELOS will build on the initial work of two very successful previous activities

also sponsored by ERCIM and aimed at promoting research in the Digital Library field under the Fourth and the Fifth Framework programmes: the DELOS Working Group 1996-99, and the first DELOS Network of Excellence 2000-2003.

Digital libraries represent a new infrastructure and environment that has been made possible by the integration and use of a number of IC technologies, the availability of digital content on a global scale and a strong demand from users who are now online. The DELOS 10-year grand vision is that "Digital Libraries should enable any citizen to access all human knowledge any time and anywhere, in a friendly, multi-modal, efficient and effective way, by overcoming barriers of distance, language, and culture and by using multiple Internet-connected devices".

The main objective of the DELOS NoE is to define and conduct a joint program of activities (JPA) in order to integrate and coordinate the ongoing research activities of the major European research teams in the field of digital libraries for the purpose of implementing the DELOS digital library grand vision.

Specific technical objectives of the DELOS NoE are to:

- develop a common architectural digital library infrastructure that can be customized to meet the requirements of different applications
- provide a common foundation for several forms of information seeking, searching and querying in digital libraries, so that it may become possible for all members of society to be provided by digital library systems in a cohesive way
- establish a sound framework for expressing and managing unconventional information manipulations that are critical in many applications
- establish a theoretically motivated and empirically supported frame of reference for designers and researchers in the field of user interfaces and visualization techniques
- develop mechanisms for the preservation of complex and dynamic objects

- provide a theoretical and practical framework for the evaluation of digital libraries and their components.

Other important objectives of DELOS are to:

- network and structure European research on digital libraries, so as to consolidate an emerging community
- contribute towards improving the effectiveness of European research in the digital library field
- provide a forum where researchers, practitioners, and representatives of interested applications and industries can exchange ideas and experiences
- contribute towards improving international cooperation in digital library research areas.

The major milestones for the DELOS NoE are:

- the DELOS portal, which will maintain and make accessible the collection of all the results and reports produced by the Network. It will also provide information on the most recent research results in the field of digital libraries as well as the latest information about relevant international projects, initiatives, conferences, etc
- a cross-referenced survey of the technologies in use and the state of the art in all the DL-related fields, which will be made available to the research community
- a reference architecture of a Digital Library Management System (DLMS). This will be jointly defined by the Network participants
- one or more DLMS prototypes, implemented according to the reference architecture, and developed jointly by the Network participants.

The Joint Program of Activities is organized into seven research clusters and is composed of three types of activities — integration, research and dissemination: Digital Library Architecture, coordi-

nated by the Swiss Federal Institute of Technology and the University for Health Informatics and Technology, Tyrol; Information Access and Personalization, coordinated by the University of Athens; Audio/Visual and Non-traditional Objects, coordinated by the University of Florence and the Technical University of Crete; User Interfaces and Visualization, coordinated by the University of Rome 1; Knowledge Extraction and Semantic Interoperability, coordinated by UKOLN, University of Bath; Preservation, coordinated by the University of Glasgow; Evaluation, coordinated by the University of Duisburg.

In order to coordinate the dissemination effort of the wide range of activities carried out by the Network, a Virtual D-Lib Competence Center (VDLCC) will be established. In addition to providing support for the dissemination of the Network activities, the Center will provide education, training and technology transfer to research, memory institutions and industrial organizations in the field of digital libraries. The Virtual D-Lib Center will be implemented by the coordinated efforts of three institutions participating in the Network, strategically located in Europe: ISTI-CNR in Italy, UKOLN (University of Bath) in the UK, and Netlab (University of Lund) in Sweden.

The Network is managed administratively and financially by ERCIM and scientifically by the Institute for Information Science and Technologies of the Italian National Research Council (ISTI-CNR).

<http://www.delos.info/>

Working Groups

The purpose of an ERCIM working group is to build and maintain a network of ERCIM researchers in a particular scientific field. The working groups are open to any researcher in the specific scientific field. Three new groups have been established during 2003 and 2004: 'Informatics and Mathematics applied to Interventional Medicine', 'Rapid Integration of Software Engineering Techniques' .

The activities of a Working Group can be divided into several areas: workshops to build the community and maintain its vibrancy, projects to move forward the R&D in the particular area of the working group, and human mobility (internal mobility and fellows) to assure the appropriate trained human capital. A working group receives support in the form of initial seed money, on application to the ERCIM Executive Committee, to set up a first workshop.

Travel support is given to ERCIM researchers by their institutes to participate in the workshops organized by the working group. It is expected that each working group organizes at least one annual workshop. A major activity of an ERCIM working group is to search actively for project funding that crosses national borders. 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-year calls published for the ERCIM 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 editorship for the special theme sections. They also participate actively in producing ERCIM strategic reports.

ERCIM working groups can apply for the Working Group Award (up to 20,000 Euro) which is given each year to the best group. The winner of the 2003 award was the Working Group Formal Methods for Industrial Critical Systems.

<http://www.ercim.org/activity/workgroup.html>

ERCIM Working Groups

Applications of Numerical Mathematics in Science

Coordinator: Mario Arioli, CCLRC

Biomedical Informatics

Coordinators: Manolis Tsiknakis and Dimitris Kafetzopoulos, FORTH

Constraints

Coordinator: François Fages, INRIA

Workshops:

- Joint Annual Workshops of the ERCIM Working Group on Constraints and the CologNet area on Constraint and Logic Programming on Constraint Solving and Constraint Logic Programming, Budapest, Hungary, 30 June - 2 July 2003
 - Joint Annual Workshop of ERCIM/CoLogNet on Constraint Solving and Constraint Logic Programming, Lausanne, Switzerland, 23-25 June 2004.
- Fellows:* Pawel Pietrzak at SpaRCIM (UPM).

Control and System Theory

Coordinator: Laszlo Gerencser, SZTAKI

Dependable Software-Intensive Systems

Coordinator: Erwin Schoitsch, Austrian Research Centers Seibersdorf/AARIT

E-learning

Coordinator: Sepideh Chakaveh, Fraunhofer IMK

Workshop:

2003 ERCIM E-learning workshop, Crete, 24 June 2003.

Fellow: Soha Maad at Fraunhofer IMK

Environmental Modelling

Coordinator: Achim Sydow, Fraunhofer FIRST

Workshops:

- 10th ERCIM Environmental Modelling Group Workshop on Environmental Risk Management, Sophia Antipolis, France, 26-28 February 2003
- 11th ERCIM Environmental Modelling Group Workshop on Advanced Technology for Environmental Modelling, Smolenice Castle, Slovakia, 20-22 October 2003,

- 12th ERCIM Environmental Modelling Group Workshop, 24 and 27 May 2004, Hersonissos, Crete, Greece
- Fellow:* German Torres at Fraunhofer FIRST and INRIA

Formal Methods for Industrial Critical Systems

Coordinator: Stefania Gnesi, CNR

Workshops:

- 8th International Workshop on Formal Methods for Industrial Critical Systems, Trondheim, Norway, 5-7 July 2003
- 9th International Workshop on Formal Methods for Industrial Critical Systems, Linz (Austria), 20-21 September 2004

Fellows: Jan Cederquist at INRIA and CWI

Award: The group has been awarded the 2003 working group award

Image and Video Understanding

Coordinator: Eric Pauwels, CWI

Fellows: Charith Abhayaratne (CWI and INRIA), Alin Achim (CNR and INRIA).

Project: MUSCLE Network of Excellence, funded by the EC 6thFP IST Programme

IT and Mathematics applied to Interventional Medicine

Coordinator: Marc Thiriet, INRIA

Workshops:

- 2003 workshop in Luxembourg, 1-2 December 2003
- 2004 workshop in Marseilles, 1-2 September 2004.

Matrix Computations and Statistics

Coordinator: Bernard Philippe, INRIA

Workshops:

- Fourth workshop combined with Numerical Linear Algebra and its Application, Bari, 22-24 September, 2003 Conference site
- Fifth workshop combined with COMPSTAT 2004 (Numerical Workshop), Prague 27-29 August, 2004.

Fellow: Marios Fyrrillas at INRIA Rennes and the University of Neuchatel/SARIT.

Rapid Integration of Software Engineering Techniques

Coordinator: Nicolas Guelfi, FNR

Workshop: RISE 2004 International Workshop on Rapid Integration of Software Engineering Techniques, Luxembourg, 26 November 2004...

Semantic Web

Coordinator: Dimitris Plexousakis, ICS-FORTH

Workshop: First ERCIM Semantic Web Working Group workshop, Hersonissos, Crete, Greece, 27 May 2004.

Soft Computing

Coordinator: Petr Hajek, Institute of Computer Science, Academy of Sciences of the Czech Republic/CRCIM

Workshops:

- Second ERCIM Soft Computing Workshop, Brno, Czech Republic, 18-20 October 2003
- Third ERCIM Soft Computing Workshop in conjunction with the workshop "The challenge of semantics", Technical University Vienna, 12-17 July 2004.

Software Evolution

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

Workshop:

Joint Workshop of ESF RELEASE, the ERCIM WG on Software Evolution, and the EU RTN Workshop SegraVis Software Evolution through Transformations: Model-based vs. Implementation-level Solutions, Rome, 2 October 2004

User Interfaces for All

Coordinator: Constantine Stephanidis, ICS-FORTH

Workshop: 8th ERCIM Workshop "User Interfaces For All" Vienna, Austria 28-29 June 2004.

Rapid Integration of Software Engineering Techniques

The main goal of the new ERCIM Working Group on Rapid Integration of Software Engineering Techniques (RISE) is to conduct research into new, integrated and practical software engineering approaches. These will be part of a methodological framework and will apply to new and evolving applications, technologies and systems.

The Working Group (WG) defines itself by the following keywords:

Integrated solutions: we envisage the WG developing projects that will promote the integration of software engineering (SE) techniques. The rate of progress in SE research means that many techniques are simultaneously under development and must often be integrated with complementary approaches (for example, research on development process definition and architecture engineering, architectural frameworks and architecture description languages, reuse and software architecture, reuse and test techniques, modelling languages and semantics). We believe that working on the integration of SE techniques will:

- ease collaborations between ERCIM partners
- raise targeted/applicative/technological research problems for each of the integrated techniques as well as for the novel integrated solution
- allow the joint development of new and powerful solutions covering several aspects of the software engineering process.

Practical solutions: we want to focus on concrete applications. Research in software engineering should provide solutions that will support the development process, which means the research problems and the real-life situations in which they exist must be well defined. This does not mean that fundamental research is excluded; rather it means that fundamental problems must be raised and solved in a manner that preserves efficiency and usefulness. Linked with the previous notion of integration, we will

undertake research for the mid-term (three to six years). Further fundamental research raised by the WG will be taken up by partners outside the WG.

New solutions: the objective is to identify novel SE techniques, methods and tools before the need for them arises. In other words, due to ICT being such a rapidly evolving sector, we intend RISE to work on solutions to anticipated problems, rather than currently existing ones (we do not want to repeat the so-called software crisis of the 60s).

Methodological guidance: we believe that software engineering solutions should always come with methodological support. RISE will therefore work on the definition of this notion, and any solutions it provides will always be provided with methodological support.

Sub-Domains of Interest

Rather than addressing the entire scope of software engineering, the RISE working group will focus on the following sub-domains:

- software/system architecture
- reuse
- testing
- model transformation/model-driven engineering
- requirement engineering
- lightweight formal methods
- CASE tools.

Specific Domains of Application and Industry Sectors

The RISE working group will limit its research to specific application domains:

- Web systems
- mobility in communication systems
- high-availability systems
- embedded systems.

Further, certain specific industry sectors will be given priority:

- finance and insurance
- telecommunications
- avionics and automotive
- e-Government.

Constraints on Contribution

In order to attract a coherent set of contributions, RISE wishes the following constraints to be applied to proposals:

- a clear statement of the research problems to be addressed must be provided
- at least two approaches for integration should be proposed
- a methodological guideline should be proposed
- tool support should be provided
- a validation example should illustrate the proposal.

These constraints should be considered as final objectives for the proposals submitted to the WG. An incremental approach will be followed to organise the research work. While the working group will address problems that only partially adhere to these objectives, we want to stress that such problems should be presented with reference to a globally coherent perspective that respects the constraints of the WG.

The current RISE participants are: Juan Bicarregui (CCLRC), Antonia Bertolino (CNR-ISTI), Paul Klint (CWI), Nicolai Guelfi (FNR), Anthony Savidis (FORTH), Marc Born, Eckhard Moeller, Ina Schieferdecker (Fraunhofer FOKUS), Valérie Issarny (INRIA), Finn Arve Aagesen (NTNU), Joe Armstrong (SICS), Ernesto Pimentel (SpaRCIM), László Monostori (SZTAKI) and Jyrki Haajanen (VTT).

Interested scientists and teams from research and industry who would like to participate in the RISE Working Group should contact the WG coordinator Nicolai Guelfi.

<http://rise.uni.lu/>

IM2IM – Informatics and Mathematics applied to Interventional Medicine

The ERCIM Working Group "IM2IM" has been initiated in June 2003 in the context of minimally invasive treatment in medicine and surgery. The research is aimed at developing medical simulators.

Nowadays, many medical operations are based upon minimal-invasive, safe and cheap procedures. High precision medicine with as little invasion as possible, are required to improve patient comfort and reduce hospitalisation costs. Interventional medicine consists in placing a small effective and reliable medical device inside any anatomical duct. As endoluminal operations tend to involve precise, complex and risky techniques, doctors yearn more and more for simulation tools with which to train themselves, plan operations and ensure detailed follow-up on the state of their patients.

The new operational techniques demand indeed the acquisition of new gestures. This is due in particular to the screen interface, which does not provide a direct, three-dimensional view. In a way somewhat similar to what flight simulators are to aircraft pilots, simulation tools are very much in demand by medical doctors; either to learn the gestures, plan them, train, operate or follow-up the post-operation evolution. However, one of the main difficulties in achieving a sufficiently realistic reproduction not only of the visual aspects, but also of the tactile aspects of the situation, is to correctly model the mechanical behaviour of the various involved organs and anatomical tissues. Overcoming these difficulties is an important challenge.

Applied mathematics and computer science are necessary tools in these advances in medical techniques. Image processing, computer graphics and virtual reality, modelling and simulation of the behaviour of biological tissues and robotics are all involved. The develop-

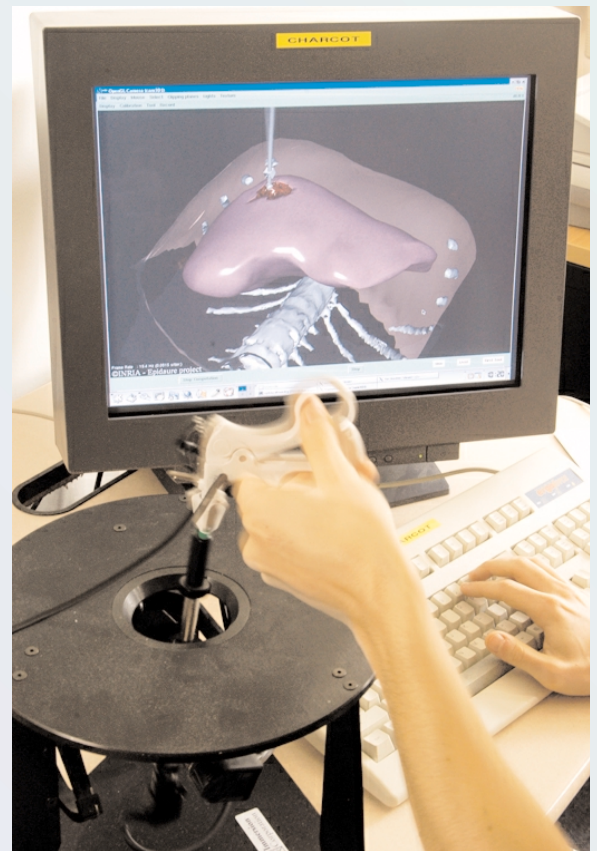
ment of the computer-aided medical tool indeed requires several tasks:

- three-dimensional reconstruction of the vascular region of interest from medical imaging and computational mesh generation
- input data collection and control parameter selection
- numerical model coupling for interaction between the vessel wall, the owing blood and the medical device
- multiscale modeling to ensure suitable wave propagation and appropriate boundary conditions
- parallel computing to speed up the computational time for medical purpose
- numerical result processing and physical entity field visualisation

- error estimation and physics-based dynamical mesh adaptation
- virtual endoscopy with a navigation tool for endoluminal catheter displacement and device installation control
- augmented reality training simulator.

Current participants come from the ERCIM members CNR, INRIA, Fraunhofer-Gesellschaft, FORTH, SARIT (EPFL, ETH), SpaRCIM (UPM), as well as from other institutions in Canada, China, Chile, France, Greece, Italy, Israel, Spain, UK, USA, Taiwan.

<http://www-rocq1.inria.fr/Marc.Thiriet/Im2im/>



Haptic system for hepatic surgery simulation (in collaboration with 'Institut de Recherche sur les Cancers de l'Appareil Digestif - IRCAD - Hôpitaux de Strasbourg').
© INRIA

Software Evolution

In November 2004, the ERCIM consortium approved a new Working Group on Software Evolution. The purpose of this ERCIM Working Group (WG) is to build and maintain a network of ERCIM researchers within the particular scientific field of software evolution. In this sense, the WG will serve as a natural successor to an existing Scientific Network called RELEASE that will continue to be financed by the European Science Foundation until autumn 2005.

The inaugural meeting of the WG was held on 2 October 2004 in the Università Degli Studi in Rome. It was co-located with ICGT 2004, the International Conference on Graph Transformation. The goal of the meeting was twofold: from the point of view of research, it served as a workshop for researchers to present recent results from a broad range of activities that fit within the general topic of 'Software Evolution through Transformations' (for more information, see http://wwwcs.upb.de/cs/ag-engels/ag_engl/Segravis/Events/SETra04/); the second goal was to start up a new ERCIM Working Group on Software Evolution.

The meeting was very successful, with thirty participants from eleven European countries attending. Twelve participants were members of the ongoing European Science Foundation 'RELEASE' research network, and representatives were present from eight ERCIM institutes.

Following the success of the meeting, the ERCIM Board of Directors decided to approve the proposed Working Group as an official ERCIM WG. At the time of writing, members of over 25 different research groups in European Universities, fourteen of which are ERCIM partner institutes, have already expressed their interest in becoming members of the WG, and this number is growing. If you are interested in joining the WG, please consult our membership

policy and follow the procedure explained on our website (see below).

Motivation

The scientific motivation for the WG is that numerous scientific studies of large-scale software systems have shown that the bulk of the total software-development cost is devoted to software maintenance. This is mainly because software systems need to evolve continually to cope with ever-changing software requirements. Unfortunately, existing techniques and tools for the support of software evolution have many limitations, including being (programming) language-dependent, not scalable, difficult to integrate with other tools and lacking in formal foundations.

The principal goal of the proposed WG is therefore to identify a set of formally founded techniques and associated tools to aid software developers with the common problems they encounter when evolving large and complex software systems.

The WG intends to address a diverse array of evolution problems. We will not only attack the technical aspects of software evolution (the how), but also try to understand and model the fundamental principles behind software evolution (the what and the why). Following is a tentative and inevitably incomplete list of topics to be addressed:

- specification or analysis of the evolution of software artefacts in a broad sense (including, but not limited to requirement specifications, architectures, designs, models, metamodels, programs, components, tests, documentation, bug reports, version control information, log files, release histories, language descriptions, APIs and protocols)
- re-engineering and reverse engineering
- software restructuring, refactoring and renovation
- model-driven engineering and model transformation

- co-evolution, consistency maintenance and inconsistency management
- impact analysis, effort estimation, cost prediction, evolution metrics
- traceability analysis and change propagation
- version control and configuration management
- run-time adaptation and dynamic reconfiguration
- family and product-line engineering
- methods, processes and tools for managing software evolution
- development of a formal theory of software and systems evolution.

Activities in 2005

As for all other ERCIM WGs, recurrent activities include proposing new European research projects, enhancing intra-European collaboration at both research and teaching levels, collaborating with other WGs, and organising scientific events (eg international workshops).

In 2005, the WG will organise the following activities:

- a symposium on Software Restructuring, 6 January 2005, Gent, Belgium (co-financed by FWO/FNRS, Belgium)
- the annual WG meeting, focussing on 'Challenges in Software Evolution', to be held in Bern in April 2005.

Other activities may be added to the calendar; an up-to-date list can be found on the WG website.

<http://w3.umh.ac.be/evol/>

Biomedical Informatics

On an initiative by scientists from FORTH, ERCIM's Board of Directors has established a Working Group on Biomedical Informatics in December 2004.

Following the release of the Human Genome Project data, bioMedical informatics (BMI) has emerged as a scientific field worldwide, bringing together the disciplines of medical informatics, medical imaging, bioinformatics and possibly neuroinformatics in order to support individualized and proactive medicine in the post-genomic era. The mission of BMI is to provide the technical and scientific infrastructure and knowledge to allow evidence-based, individualized healthcare using all relevant sources of information.

BioMedical informatics aims not only to bring together these traditionally distant scientific disciplines but also to synthesize and exploit the whole spectrum of health-related information, from molecules (ie molecular interactions, molecular imaging), to cells (neuron signalling, proteomic and transcriptomic profiles), to tissues, organs and organisms (cancer classification, pathogens), to individuals (integrated EHR, genotypes) and populations (epidemiology and public health records). BioMedical informatics touches on all basic and applied fields in biomedical science and is closely tied to modern information technology, notably in the areas of computing and communication.

Europe has demonstrated considerable interest, great momentum and substantial results in relevant fields over the years, by participating in most of the genome research projects, establishing outstanding facilities for bioinformatics (eg SwissProt and EBI) and by leading research and development in medical informatics through health telematics, medical imaging, health information networks and eHealth programs. Further, several groups in ERCIM institutions have oriented their interest in this multi-disciplinary and emerging field of

BioMedical Informatics, have played a crucial role in defining and guiding the R&D agenda in this area (see J. Biomed. Inform. (2004), 37:30-42) and have already achieved a high level of recognition. This momentum needs to be sustained and advanced.

The ERCIM BioMedical Informatics Working Group (WG) intends to promote interaction and collaboration between ERCIM R&D groups relevant to this area, and to facilitate cross-fertilization and synergies between distant scientific disciplines. The overall aim is to consolidate and advance this new field of research, enabling a better level of individualized health care in the post-genomic era.

Particular emphasis has been placed on understanding the link between genes, disease and the environment, and on the development of predictive models for diseases linked to genetic and environmental risk factors. This will allow appropriate preventive measures to be taken and progress to be monitored continuously. Researchers in the following fields could be interested and included in the activities of the WG:

- integration and analysis of genetic and medical information for health applications
- biomedical ontologies
- gene expression analysis (computational and experimental)
- genetic imaging
- modelling of genetic disorders and diseases
- GRID- based approaches to molecular-biomedical applications
- data mining and visualization of biomedical data
- computational methods and tools to support individualized medicine.

1. The Working Group also aims to promote awareness of promising basic and applied research results and their potential industrial adoption, in order to promote relevant standards and foster mobility of ERCIM researchers.

2. A number of ERCIM institutes and/or individual researchers from eleven European countries have actively participated in the initial meetings and discussions aiming at defining the scope and objectives of the WG or have expressed their interest in participating and contributing to future activities of the WG. The Working Group is open and we welcome new members. Potential collaborations and common activities have also been discussed with the recently formed Working Group of the International Medical Informatics Association (IMIA).

The immediate plan of action for the WG includes:

- liaising with the EU, providing contributions towards the elaboration of the EU research agenda and priorities in the domain
- establishing R&D collaborations between the participating organizations (special efforts will be made in coordinating the submission of research proposals within the European Framework Programs)
- taking action in order to assist the mobility of (in particular young) researchers within the ERCIM BMI community
- organising a scientific workshop in the spring of 2005.

The WG has also been invited to submit a proposal for the organization of a satellite workshop during the VLDB international conference to be held in September 2005. The purpose of this would be to emphasize to the VLDB research community the significant challenges raised by biomedical informatics related to ontologies, semantic integration of heterogeneous and distributed resources, visualization of large and complex data sets, and so on.

The Web site for the Working Group will be available soon, with information and details of all activities, performed or planned.

<http://www.ercim.org/activity/workgroup.html>

Semantic Web

“Integrating knowledge and processes towards an effective Semantic Web infrastructure for creating and providing semantically enriched web-accessible services”.

One of the major issues that always arise when discussing the Semantic Web is to define exactly what a Semantic Web is and how it is different from other systems it may erroneously be likened to. As a facility enabling the automatic and efficient exploitation of knowledge at a global scale, the Semantic Web involves a large number of different kinds of information and associated processes. Beyond the current web, the Semantic Web is expected to become a huge human-readable but also machine-processable knowledge repository, together with services which automates activities currently enacted by humans.

The concept of the Semantic Web bears some intrinsic very challenging difficulties. The vast majority of these arise on one hand from the human-like nature of the web, i.e., unstructured, unbound, semi-open, allowing solely local integrity control, undergoing non-deterministic changes, and not globally consistent; and on the other hand, the need for machine processability, which most of the time relies on closed, finite and highly structured systems that are globally consistent, allowing global integrity checking. The Semantic Web is at the crossroad of these two paradigms. In order to take full advantage of the Semantic Web potentialities, one has to combine design content representation and applications, which are able to reconcile those two apparently antinomic natures. From this, it appears clearly that the Semantic Web induces novel requirements for both data and processing that need to take the nature of the web into account.

In order to address these very challenging issues, a new ERCIM Working Group dedicated to Semantic Web has been officially launched in November 2003 during the ERCIM fall meeting

hosted by the Centre de Recherche Public Henri Tudor in Luxembourg. Its primary objective is to bring together specialists of various disciplines into consolidating their knowledge and the results of their research activities towards the realisation of the Semantic Web. Doing so, it intends to strengthen the already excellent cooperation existing between ERCIM member institutions and a series of other partners engaged in a sustained effort towards the implementation of an effective Semantic Web infrastructure. As a founding principle, the ERCIM Working Group on Semantic Web pays a particular attention to addressing both fundamental and applied aspects of the research efforts pertaining to the Semantic Web by adopting a unified stance towards knowledge and process.

The inaugural workshop of the Working Group took place on Thursday the 27th of May 2004 in Hersonissos, Crete (Greece), conjointly with the ERCIM spring meeting, and was followed on Friday morning by the Working Group meeting. About 30 researchers coming from more than a dozen European countries registered and about 20 of them effectively attended the workshop.

As it has been already mentioned above, the Semantic Web as an infrastructure represents a wide research field that brings the research community in front of a novel situation in which synergies and collaboration at the deepest level is strictly required to face the challenge with some chances of success. Considering the twelve high quality contributions that were presented during the workshop, among which seven consisted in full research papers and five in current research and position papers, the workshop program and represented research areas reflected this pretty well.

Contributions to the workshop program addressed various topics such as

- Modelling in general and ontologies in particular, with discussions about the role of foundational ontologies and

conceptual modelling for the semantic web, as well as novel ideas towards Semantic Web engineering;

- Web services with a particular insight on Semantic Web implication related to web services that are used to augment the perceived value of primary services, and P2P networks, with a particular focus on query routing and information mediation frameworks;
- Reasoning with incomplete and inconsistent information using defeasible logics as a mean to integrate ontologies and deal with rules allowing exceptions, aggregation functions to query and combine distributed imperfect information, and processing the Semantic Web in general;
- Video and Digital Libraries with a special interest in using reusable fragments according to semantic information, for geo-referencing and searching in heterogeneous Digital Libraries, and in a core ontology aimed at mediating cultural information.

During the meeting, several important topics regarding both the organisation of the Working Group and plans for defining and funding future collective research actions were discussed. As the commitment of members is a crucial issue in the achievement of the Working Group objectives, it has been decided to set up a formal membership agreement and a WG charter all member must agree on. In addition, each Steering Committee member is invited to produce a mission statement. Regarding common projects, it has been decided to carry on setting up the FP6 Research and Training Network proposal SWIS to be submitted in September. COST actions have also been considered.

<http://www.ercim.org/activity/workgroup.html>

Fellowship Programme

The PhD Fellowship Programme has been established as one of the premier activities of ERCIM. Since its inception in 1991, some 150 fellows have passed through the programme. 21 young scientists commenced an ERCIM PhD Fellowship in 2003, 15 in 2004. 55 fellows have been employed during the period 2003/2004, representing 262 man-months in 2003 and 254 in 2004.

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. 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.

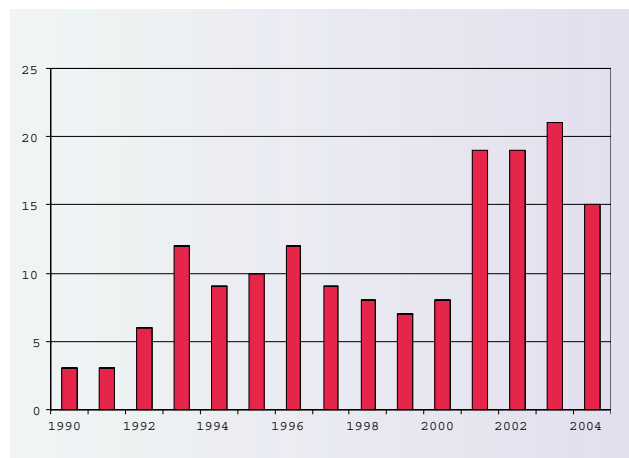
Conditions for Application

Applicants must:

- have a PhD degree (or equivalent) or be in the last year of the thesis work
- be fluent in English
- be discharged or obtain deferment from military service.

Fellowships are of eighteen months' duration, generally spent in two member institutes. Fellows receive a monthly allowance which may vary depending on the country. In order to encourage mobility, a member institution is not eligible to host a candidate of the same nationality. Deadlines for applications are currently 30 April and 30 September every year.

<http://www.ercim.org/fellowship/>



Number of fellows who have started an ERCIM grant in the corresponding year.

Fellow	Nationality	Hosting Institute(s)	Period
Andreas Rauber	Austrian	CNR INRIA	01/09/01-31/05/02 01/06/02-28/02/03
Christoph Sprenger	Swiss	SICS INRIA	01/08/01-31/06/02 01/10/02-30/06/03
Christian Mönch	German	NTNU SZTAKI	01/03/02-30/11/02 06/01/03-05/10/03
Maurice Ter Beek	Dutch	SZTAKI CNR	11/03/02-11/12/02 01/01/03-30/09/03
Bixin Li	Chinese	NTNU CWI	02/04/02-31/12/02 01/04/03-31/12/03
Marios Fyrrillas	Cypriot	INRIA SARIT	15/04/02-14/01/03 15/01/03-14/10/03
Maad Soha	Lebanese	FhG	15/04/02-14/10/03
Charith Abhayaratne	Sri Lankan	CWI INRIA	10/06/02-09/03/03 10/03/03-09/12/03
Daniela Vasileva	Bulgarian	FhG CWI	01/09/02-31/05/03 01/09/03-31/05/04
Yannis Tzitzikas	Greek	CNR VTT	01/10/02-30/06/03 10/07/03-09/04/04
Elaine Raybourn	American	FhG INRIA	01/10/02-30/06/03 25/08/03-24/09/03
Richard Moot	German	INRIA	01/10/02-30/06/03
Luciane Quoos Conte	Brasilian	NTNU	07/10/02-06/07/03
Ribeiro Fernandes Martins	Portuguese	FhG INRIA	15/10/02-14/07/03 -15/10/03-14/07/04
Monica Vladioiu	Romanian	NTNU	07/11/02-06/08/03
Serguei Roubstov	Russian	VTT	01/12/02-31/08/03
Rosella Gennari	Italian	CWI	09/12/02-30/03/03
Mohamed El Ansari	Moroccan	NTNU	11/12/02-26/08/03
Mohamed Abdelwahed	Tunisian	INRIA	01/01/03-30/09/03
German Torres	Argentine	FhG INRIA	01/01/03-30/09/03 01/10/03-30/06/04
Zhou Jehian	Chinese	VTT INRIA	09/01/03-05/10/03 09/10/03-08/07/04
Mathias Géry	French	VTT	15/01/03-15/08/03
Ismail Rafatof	Kyrgyz	CWI	01/02/03-31/10/03
Jan Cederquist	Swedish	INRIA CWI	10/03/03-09/12/03 05/01/04-04/10/04
Hatem Haddad	Tunisian	VTT NTNU	01/04/03-31/12/03 07/01/04-06/08/04
Petteri Mannersalo	Finnisch	EPFL/SARIT CWI	01/05/03-31/01/04 01/02/04-31/10/04
Youssef Alfakhi Abdo	Labanese	NTNU	12/05/03-18/08/03
Florica Mindru	Romanian	FhG	15/05/03-14/02/04
Cesar Mendoza	Mexican	CNR	16/06/03-15/03/04
Yann Laurillo	French	CNR	01/09/03-31/05/04
Gabriela Avram	Romanian	FhG FNR	01/09/03-31/05/04 01/06/04-28/02/05
Hend Koubaa	Tunisian	FhG NTNU	01/09/03-31/05/04 08/06/04-07/03/05
Venkatesh Babu Radhakrishnan	Indian	NTNU INRIA	18/09/03-17/06/04 18/06/04-17/03/05
Sahbi Hichem	French	FhG	01/10/03-30/06/04
Tomasz Powierza	Polish	FhG	01/10/03-30/06/04
Alin Achim	Romanian	CNR INRIA	01/10/03-30/06/04 01/07/04-30/09/04
Mania Marangazova	Bulgarian	CWI	01/10/03-31/07/04
Victor Bayon Molino	Spanish	FhG	01/10/03-31/12/04
Bertrand Le Saux	French	CNR Uni. Bern/SARIT	01/10/03-30/06/04 01/07/04-31/03/05
Gabriela Espinosa	Mexican	NTNU	01/11/03-31/12/04
Emmanuel Stefanakis	Greek	FhG	01/01/04-30/09/04
Yuming Jiang	Chinese	NTNU	05/01/04-04/10/04
Renaud Péteri	French	SZTAKI CWI	05/01/04-04/10/04 11/10/04-10/07/05
Paris Avgeriou	Greek	FNR FhG	05/01/04-04/10/04 05/10/04-04/07/05
Swades De	Indian	CNR	07/01/04-30/06/04
Michael Lones	British	NTNU	01/04/04-31/12/04
Ivan Djordjevic	Serbian	CCLRC	15/05/04-14/02/05
Zsolt Nemeth	Hungarian	INRIA FORTH	17/05/04-16/02/05 14/03/05-13/12/05
Alexander Anufriev	Russian	SZTAKI	15/07/04-14/04/05
Vsevolod Laptev	Russian	FNR NTNU	01/09/04-31/05/05 01/06/05-28/02/06
Pawel Pietrzak	Polish	UPM/SpaRCIM INRIA	01/09/04-30/05/05 01/06/05-28/02/06
Raphael Troncy	French	CNR CWI	08/11/04-07/08/05 01/09/05-31/05/06
Gerd Utz Westermann	German	VTT INRIA	01/11/04-31/07/05 01/09/05-31/05/06
Christophe Jelger	French	Uni. Basel/SARIT FhG FOKUS	01/11/04-31/07/04 22/08/05-21/05/06
Claude Chaudet	French	CNR	01/11/04-31/01/05

Fellows hosted by ERCIM institutes during 2003/2004.

Cor Baayen Award 2003 for Ronald de Wolf



Ronald de Wolf (left) receives the Cor Baayen Award from ERCIM President Gerard van Oortmerssen. On the right is Erna Hennicot-Schoepges, Luxembourg Minister for Culture, Higher Education and Research, who welcomed the participants to the ERCIM meetings in Luxembourg.

The 2003 ERCIM Cor Baayen Award was presented to Ronald de Wolf during a ceremony in Luxembourg on 5 November 2003.

Ronald de Wolf did his PhD in the area known as quantum information processing and quantum computing. It is remarkable that as an undergraduate he had already written, together with Nienhuys-Cheng, the standard text on a completely different topic called Inductive Logic Programming. This book alone figures as a very impressive PhD thesis. De Wolf received PhD placement offers from MIT and CMU, but decided instead to study at the CWI.

Quantum information processing is a new and important field that combines the physical laws of quantum mechanics with those of computation, resulting in a new model of computation: the quantum computer. The field gained momentum when Peter Shor demonstrated the speed with which such quantum computers could factor large numbers. Most current cryptography, including electronic commerce, is based on the fact that

no sufficiently fast factorisation method is known for classical computers. Shor thus demonstrated that if one could build a quantum computer then most of our cryptographic protocols could be broken.

It is this societal relevance that makes quantum information processing so important. Both North American and European funding agencies have set aside significant amounts of money to invest in this new technology.

Ronald's work received the highest praise in the international community and during his PhD he received frequent invitations to speak at international meetings and conferences. Among related fields, his PhD thesis ranks among the best worldwide over the last ten years. Ronald's work had a big impact on the field of quantum information processing, and parts of his PhD thesis are now standard inclusions in textbooks on the subject. For example, the impossibility method he developed to show the limitations of quantum computers has become a standard technique and is taught around the world in any class on quantum computing. New protocols and algorithms, such as the quantum fingerprinting technique, have been used by groups such as those at MIT and Berkeley to develop new cryptographic primitives like quantum digital signatures. These advances also attracted significant attention from the press, with articles in Physics News Update, Wired, Technology Research News, Süddeutsche Zeitung and others. The work on locally decodable error-correcting codes baffled the best-known researchers in this classical area of computer science. The elegant idea of using quantum mechanics as a way of proving a classical statement is highly original, and was considered a breakthrough result in the area of locally decodable codes.

Ronald is one of the very few truly brilliant students that his professor has seen. He is able to combine great mathematical skill with intense creativity in order to solve some of the hardest problems in his field.

The Cor Baayen Award

The Cor Baayen Award, awarded to a most promising young researcher in computer science and applied mathematics, was created in 1995 to honour the first ERCIM President, and is open to any young researcher having completed their PhD thesis in one of the 'ERCIM countries', currently: Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Slovakia, Spain, Sweden, Switzerland, The Netherlands and the United Kingdom.

The award consists of a cheque for 5000 Euro together with an award certificate. The selected fellow will be invited to the ERCIM autumn meetings. A short article on the winner, together with the list of all candidates nominated, will be published in ERCIM News.

Conditions

- Nominees must have carried out their work in one of the 'ERCIM countries'
- Nominees must have been awarded their PhD (or equivalent) not more than two years prior to the date of nomination.
- A person can only be nominated once for the Cor Baayen Award.

Submitting a Nomination

- Nominations should be made by a staff member of the university or research institute where the nominee is undertaking research. Self nominations are not accepted.
- To submit a nomination fill out the Cor Baayen Award Nomination Form and provide a URL to the candidate's PhD thesis as well as the candidate's best papers (max. 5).
- Alternatively contact the ERCIM Executive Committee member (the national contact point) for the country in which the nominee is undertaking research.

Selection

- Initial selection will be made by each ERCIM institute (the national contact point) which is allowed to put forward up to two candidates from its country
- Nominees will be informed if they have been selected as one of the two candidates from their country.
- The selection of the Cor Baayen award winner is the responsibility of the ERCIM Executive Committee, who will consult expert opinion in reaching their decision.

Deadlines

Nominations must be submitted by 15 April each year.

<http://www.ercim.org/activity/cor-baayen.html>

Cor Baayen Award 2004 for Christof Teuscher

Christof Teuscher from Switzerland was presented the 5,000 Euro Cor Baayen Award for his research on unconventional biologically-inspired machines during the ERCIM fall meetings in Malaga, Spain on 3 November 2004.

Well before getting his master's degree, Christof Teuscher participated very actively in some of his lab's research projects and published several papers. His promising graduation thesis on neural networks earned him several awards. During his PhD work at the Swiss Federal Institute of Technology, Christof Teuscher published 47 scientific papers. Based on the very promising and excellent work proposed in his PhD as well as on the recommendation of his PhD supervisor Prof. Daniel Mange from EPFL (as member of SARIT, the Swiss Association for Researchers in Information Technologies nominated Christof Teuscher as their candidate for the 2004 Cor Baayen Award .



ERCIM President Keith Jeffery (left) presents the Cor Baayen Award to Christof Teuscher.

In addition to his scientific research, Christof Teuscher was also exceptionally active in all kinds of other activities: for instance, he initiated and successfully organized several international workshops, such as the 5th International Workshop on Information Processing in Cells in Tissues, was publicity chair of the First International Workshop on Biologically Inspired Approaches for Advanced Information Technology. He also published a book on Turing's connectionist ideas and edited an impressive definitive collection of commemorative essays on Alan Turing's life and legacy.

His main research interests are mostly related to biologically inspired computation and machines, and cover a wide variety of interdisciplinary research topics like emergence, complexity, artificial intelligence, information theory, novel hardware and reconfigurable architectures, smart and ubiquitous computation and computational modelling of cognitive phenomena. The gradual process of developing and self-generating lifelike artefacts by which complex adaptive behaviours emerge from the interaction of simple processing elements was a central piece of his PhD work. In his thesis he also investigated inventive approaches which materialized within the 'Biowall' (<http://lslwww.epfl.ch/biowall>).

Christof Teuscher is currently a postdoctoral researcher at the University of California, San Diego (UCSD), Department of Cognitive Science, and with this award, ERCIM acknowledges the excellence of his scientific achievements and wishes him a very successful scientific career at the borders of technical and life sciences.

Event Sponsorship Programme

ERCIM sponsors up to ten conferences and workshops or summer schools per year.

Conferences

ERCIM invites sponsorship proposals from established conferences with an international reputation, where substantive overlap can be shown between the conference topic and ERCIM areas of activity. Typical cases would include annual conferences in computer science with international programme committees, substantial international participation, and proceedings published with an established international science publisher.

Workshops/Summer Schools

ERCIM sponsors workshops or summer schools under the following conditions:

- they must be organised by an ERCIM institute
- named individuals from ERCIM partners must be involved in the organisation committee
- at least 2 non-ERCIM institutes should participate in the organising committee
- signature from one ERCIM partner.

The additional funding provided by ERCIM should be used to enhance the workshop by, for example, increasing the number of external speakers supported.

<http://www.ercim.org/activity/sponsored.html>

Events sponsored in 2003 and 2004

WCC2003 — Coding and Cryptography,
Versailles, France, 24-25 March 2003

WWW2003 — The Twelfth International World Wide Web Conference,
Budapest, 22-24 May 2003

UAHCI 2003 — 2nd International Conference on Universal Access in Human - Computer Interaction, in conjunction with the HCI International 2003 Conference
Heraklion, Crete, 22-27 June 2003

ECOOP — European Conference on Object-Oriented Programming
Darmstadt, Germany, 21-25 July 2003

ECDL2003 — 7th European Conference on Research and Advanced Technology for Digital Libraries,
Trondheim, Norway, August 17-22, 2003

FM 2003 — 12th International Formal Methods Europe Symposium,
Pisa, Italy, 8-14 September 2003

CRIS Seminar: Transforming Research Information Into Knowledge - Leveraging Research Information Assets in Driving the European Research Area (ERA)
Brussels, 18-19 September 2003

CP 2003 — 9th International Conference on Principles and Practice of Constraint Programming,
Kinsale, Ireland, 29 September - 3 October 2003

WISE 2003 — 4th International Conference On Web Information Systems Engineering,
Rome, 10-13 December 2003

SOFSEM 2004 — The Conference on Current Trends in Theory and Practice of Informatics,
Merin, Czech Republic, January 24-30, 2004

EDBT'04 — 9th International Conference on Extending Database Technology,
Heraklion, Crete, Greece, 14-18 March 2004

27th Annual International ACM SIGIR Conference,
Sheffield, UK, 25-29 July 2004

MFCS 2004 — 29th International Symposium on Mathematical Foundations of Computer Science,
Prague, Czech Republic, 22-27 August 2004

ICEC 2004 — 3rd International Conference on Entertainment Computing, Eindhoven,
The Netherlands, 1-3 September 2004

EuroCris Seminar 2004,
Brussels, Belgium, 20-21 September 2004

ECML/PKDD 2004 — 15th European Conference on Machine Learning, co-located with the 8th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD),
Pisa, Italy, 20-24 September 2004

MOVEP'04 — Modelling and Verifying Parallel Processes,
Brussels, Belgium, 13-17 December 2004

Publications

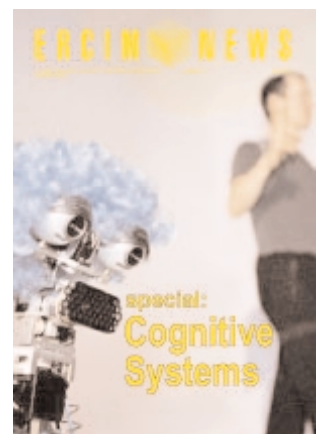
ERCIM publishes workshop proceedings, policy documents and 'ERCIM News', a quarterly newsletter.

ERCIM News

ERCIM News has evolved from an 'in-house magazine' to a publication covering reports and news about scientific projects from all over Europe and even beyond, reflecting ERCIM's growth over the years. ERCIM News is a multi-disciplinary European magazine in the areas of Information and Computer Sciences, Applied Mathematics and Communication Technologies. Published quarterly, the magazine provides regular high quality information concerning the latest European R&D and technology transfer activities in these scientific domains. 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. The topics covered by the issues published in 2003 and 2004 are 'Embedded Systems', 'Cognitive Systems', 'Application and Service Platforms for the Mobile User', 'Analysis, Diagnosis, Planning and Simulation of Industrial Systems', 'Games Technology', 'Automated Software Engineering', 'Machine Perception', and 'GRIDs - The Next Generation'. For each issue, ERCIM News invites a personality to write a keynote statement relevant to the European scientific community. Authors have included Fabio Colasanti, Director-General, European Commission, Directorate-General for "Information Society"; Erna Hennicot-Schoepges, Luxembourg Minister for Culture, Higher Education and Research; and Rosalie Zobel, Director of Directorate C: Miniaturisation, Embedded Systems, Societal Applications, Information Society Directorate-General, European Commission.

ERCIM News is the result of a close cooperation between all ERCIM institutes. It is published in printed and electronic form. The printed edition has reached a circulation of 11,000 copies and is distributed in over 100 countries. The on-line edition offers full-text search 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://www.ercim.org/publication/Ercim_News/



Workshop Proceedings

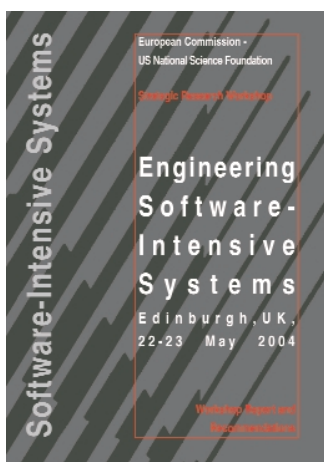
As part of the strategic workshop series under the auspices of the European Union (Information Society Technologies — Future and Emerging Technologies action) and the US National Science Foundation, 'Computer and Information Sciences and Engineering' division, ERCIM has published three reports in 2004:

- 'Engineering Software-Intensive Systems', Edinburgh, Scotland, 23-24 May 2004
- The Disappearing Computer, Vienna, Austria 23-24 April 2004
- Software-Intensive Systems, Edinburgh, Scotland, 22-23 May 2004

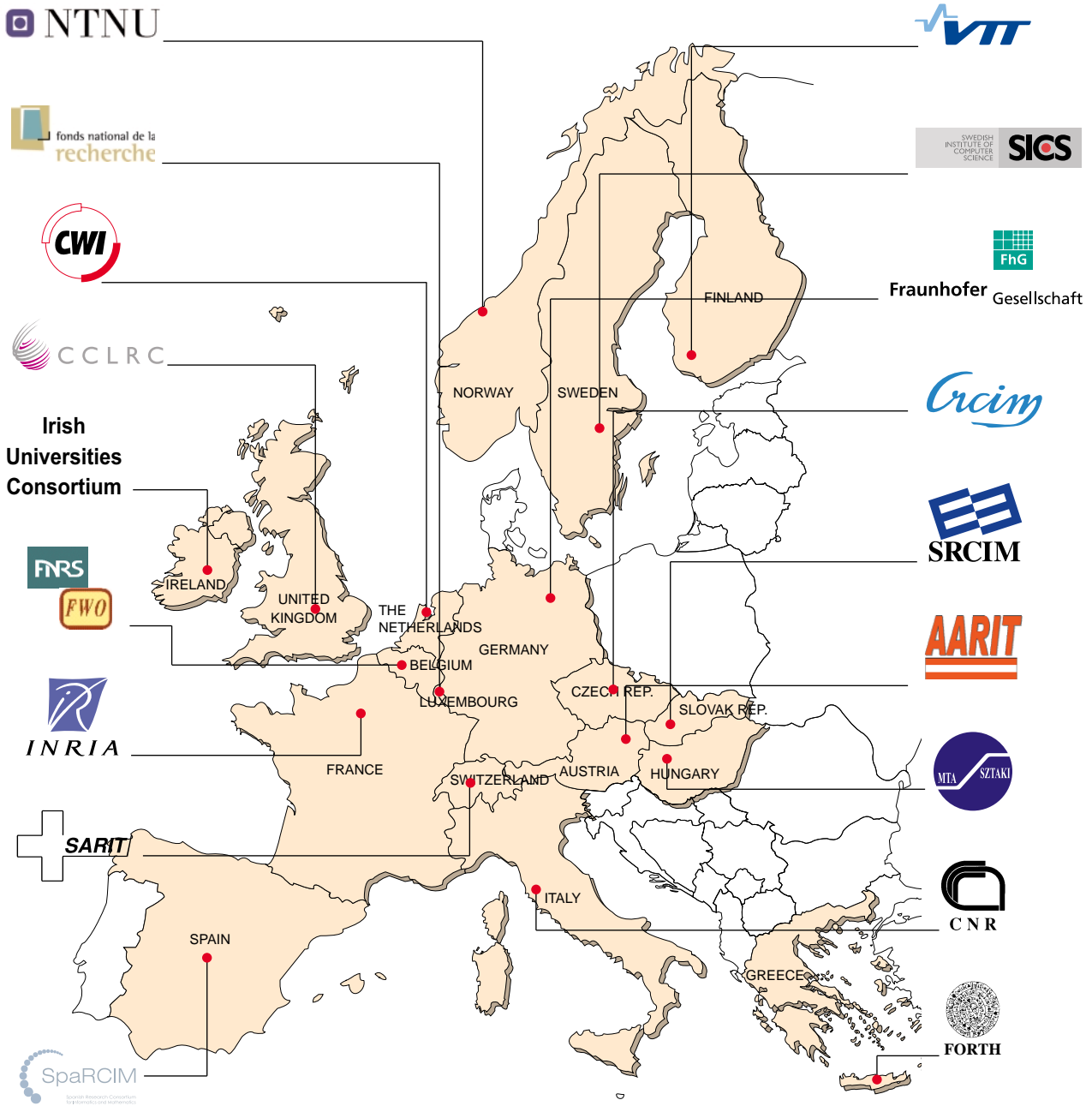
Previous workshops covered the following topics:

- Bionics — Bio-Inspired Information Technologies
- Future Information Processing Technologies
- Semantic Web
- R&D Strategy for a Dependable Information Society
- Middleware for Mobile Systems
- Digital Human Ontologies
- Interdependencies

<http://www.ercim.org/EU-NSF/>



ERCIM Member Institutes



The membership and geographical reach of ERCIM has gradually grown to its current eighteen member institutes. These are: AARIT in Austria, CCLRC in the UK, CNR in Italy, CWI in the Netherlands, FNR in Luxembourg, FNR & FWO in Belgium, ICS-FORTH in Greece, Fraunhofer-Gesellschaft in Germany, INRIA in France, NTNU in Norway, SARIT in Switzerland, SICS in Sweden, SparCIM in Spain, SRCIM in Slovakia, SZTAKI in Hungary, Trinity College Dublin in Ireland and VTT in Finland.

ERCIM members are national centres of excellence, strongly involved in European research programmes; they have strong links to their respective national academic communities, and are involved in joint projects with both small and medium-size enterprises and large industrial companies.



Austrian Association for Research in Information Technology



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.



© ARC Seibersdorf.

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 co-operation with 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 AGRID (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:

Founding members

- Austrian Research Center (ARC)/Seibersdorf Research, 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 - Oesterreichische 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 lost one founding) from universities and close-to-university institutes at Linz (2), Graz (3) and Vienna (2).



Contact:
AARIT
Wollzeile 1-3
1010 Wien
Austria
Tel: +43 1 512 02 35-0
Fax: +43 1 512 02 35-9
aarit@ocg.at
http://www.aarit.at/



Council for the Central Laboratory of the Research Councils

RESEARCH AT THE LEADING EDGE

CCLRC is the largest UK public sector science and engineering R&D laboratory. It is publicly owned - under the UK Office of Science & Technology (Department of Trade & Industry).

The Central Laboratory supports world class research activities by providing leading-edge facilities and extensive expertise, particularly in physical and life sciences and engineering at its three sites in the UK: Rutherford Appleton Laboratory (Oxfordshire), the Daresbury Laboratory (Cheshire), and the Chilbolton Observatory (Hampshire).

Major CCLRC Facilities:

- National Grid service for e-science initiative
- Synchrotron providing radiation from infrared to hard X-rays
- ISIS - the world's most powerful pulsed neutron source
- Vulcan laser - the highest intensity focused laser in the world.



Top: Real-time decision making: the RAMSES flood control centre in Bordeaux (© Suez-Lyonnaise des Eaux et Communauté Urbaine de Bordeaux).
Left: HPCx system (© CCLRC).

Computing Facilities

CCLRC's partners in the Universities and in Industry are supported by such facilities such as:

- HPCx a super computer with a processing capability of 11 Teraflops, 18 TByte data store and Gigabit Network
- The EPSRC Superscalar Computing Service - "Columbus" and a Central Simulation Facility
- Various clusters - an NT farm; a Beowulf (Linux) cluster; clusters of DEC Alphas - the OSF Service
- National Academic Mailing List Service (NAMLS)

Recent Initiatives

GRIDs. Building upon its long tradition of IT research, development and support, the CCLRC acts in a pivotal rôle in the new UK initiative to support the development of e-Science. A major component of this is the GRIDs (not just a data repository, but using meta-data and related techniques to utilise knowledge for research and industrial developments).

Recent Applications

Knowledge Management for Public Employees
Development of a customisable platform for helping public employees with key problems of knowledge management. Something that sets experienced staff apart from those less experienced is how well they handle their contacts, documents and critical timing in their work processes. A system based on software agents is being created to assist employees in this areas, providing timely and well focussed advice.

Control of Waste Water Treatment Plants

Helping to safeguard the environment by improving the monitoring and control of anaerobic waste water treatment plants. These plants are commonly used in wineries and distilleries. By using and integrating a variety of advanced techniques, and enabling remote experts to assist with their management, these plants will be run more efficiently and safely.

Partnerships

Can range from a one-off contract to truly integrated partnerships, collaborating with CCLRC staff.

Budget and Staffing

Budget for IT related areas: 22 million €
• 80% research council contracts
• 20% income from government departments, European Commission, universities and industry.
1,745 total staff, 180 IT staff (average whole-time equivalent).



CCLRC
Rutherford Appleton
Laboratory
Chilton
Didcot
Oxon
OX11 0QX
United Kingdom
Tel: + 1235 821900
Fax: + 1235 445385
http://www.cclrc.ac.uk/

CNR – Informatics and Applied Mathematics at the Italian National Research Council

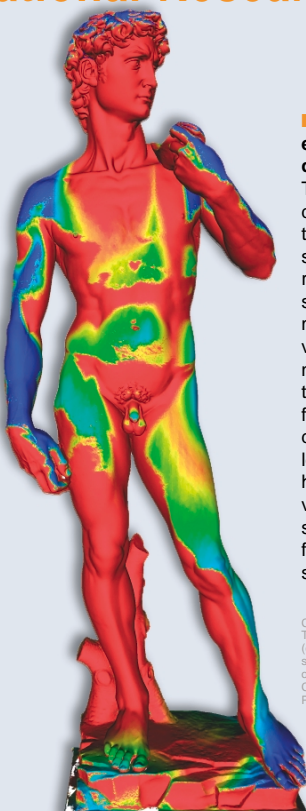


The Italian National Research Council (CNR) is a government funded organization which conducts research in nearly all the main scientific disciplines through a network of research institutes. The institutes are largely independent. The responsibility of the central body is limited to middle and long-term scientific programming and evaluation. CNR funding covers the main infrastructures, permanent staff, and some basic research. Individual institutes must find additional funding from national and international contracts.

Information Technology at CNR

The IT area at CNR is mainly covered by the following institutes:

- Istituto di Scienza e Tecnologia dell'Informazione (ISTI), Pisa
- Istituto di Informatica e Telematica (IIT), Pisa
- Istituto di Analisi dei Sistemi ed Informatica (IASI), Rome
- Istituto per le Applicazioni del Calcolo (IAC), Rome
- Istituto di Calcolo e Reti ad Alte Prestazioni (ICAR), Cosenza
- Istituto di Matematica Applicata e Tecnologie Informatiche (IMATI), Pavia.



Istituto di Scienza e Tecnologie dell'Informazione

The President of CNR has delegated ISTI to represent the IT sector in ERCIM. The strategic research areas currently covered at ISTI are: software engineering, formal methods for specification and verification, information engineering and information systems, data mining, 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.

Computer simulation of Michelangelo's David. The simulation evaluates the fall of contaminants (eg fall of rain, mist or dust) on the David's surface, which depends on surface slopes, self occlusion and accessibility. Work done by ISTI-CNR in the framework of the David Restoration Project (2002-2003).

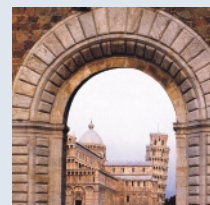
Budget

An estimated 4,4 million € per year, excluding cost of permanent staff:

- 30% EC projects
- 34% national research projects
- 15% CNR
- 8% public and local administration
- 13% industry.

Staff

Approximately 150 researchers and technicians plus varying number of graduate students and post-docs.



Contact:
ERCIM Secretariat
ISTI-CNR
Area di Ricerca CNR
Via Moruzzi, 1
56124 Pisa
Italy
Tel: +39 050 315 2878
Fax: +39 050 315 2810
<http://www.isti.cnr.it/>



Dutch Centre for Mathematics and Computer Science

FRONTIER RESEARCH FOR PRACTICAL APPLICATIONS

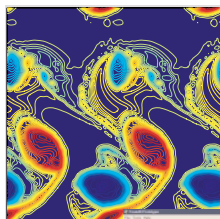
CWI is the national Dutch research institute for mathematics and computer science. Since its foundation in 1946, the institute has acquired a prominent position in the research world. CWI is a co-founder of ERCIM. The mission of CWI is twofold:

- to perform frontier research in mathematics and computer science
- to transfer new knowledge in these fields to society in general and trade and industry in particular.

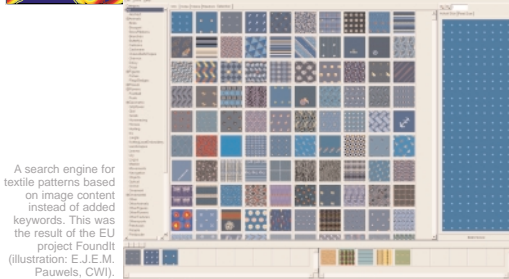
Research

CWI's research is organized in clusters of related themes:

- Probability, Networks and Algorithms
- Software Engineering
- Modelling, Analysis and Simulation
- Information Systems.



Shallow water atmospheric model simulated with the Hamiltonian Particle-Mesh method, which conserves circulation, energy and geostrophic balance (illustration: J. Frank, CWI).



A search engine for textile patterns based on image content instead of added keywords. This was the result of the EU project FoundIt (illustration: E.J.E.M. Pauwels, CWI).

Recent Applications

Railroad timetables; Integrated services in telecom networks; Semi-automatic recognition of whale tails; Software renovation; Testing embedded software with formal methods; Component-based software; Evolutionary methods for E-commerce and management; Mathematical models of living cells; Numerical simulation of electromagnetic devices; Factoring methods and data security; Interactive visualisation; Querying large distributed multimedia databases; Multimedia presentations on the Web (SMIL) and Multimedia authoring systems.

Co-operation and Knowledge Transfer

CWI maintains a broad spectrum of contacts with companies and institutions through joint participation in projects. There are direct commissions from industry and government. CWI participates in some 20 European projects, and is a partner in over 70 national projects. CWI pursues an active policy of creating spin-off companies and licensing.

Budget

Total annual budget: 13 million €

- 70% basic national funding
- 30% participation in (inter)national research programmes and from contracts with industry.

Staff (in full time equivalents)

- 158 researchers
- 52 supporting staff.



Contact:
CWI
Kruislaan 413
NL-1098 SJ Amsterdam
The Netherlands
Tel: + 31 20 592 9333
Fax: +31 20 592 4199
E-mail: info@cw.nl
<http://www.cwi.nl>

Czech Research Consortium for Informatics and Mathematics



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

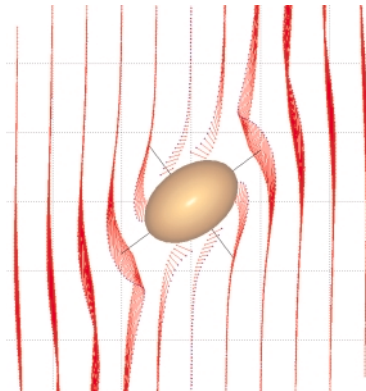


Masaryk University, Faculty of Informatics, Brno

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.



A two-dimensional cut through a rigid ellipsoidal particle rotating in a viscous flow in a regime of simple shear. Arrows indicate the velocity field in a set of chosen markers (point) of the moving fluid.

Research Topics

- Complexity Theory, Automata, Logic, Combinatorics, Computational Geometry, Parallel and Distributed Algorithms, Neural Networks, Computer Graphics, Formal Linguistic, Databases, Distributed Systems, Operating Systems, Software Engineering;

- 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;
- Theoretical Computer Science: Artificial Neural Networks, Knowledge-based Systems, Nonlinear Modelling, Numerical Nonlinear Analysis and Optimization, Applied Linear Algebra.

Budget

- 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).

European Research Consortium for Informatics and Mathematics
ERCIM
www.ercim.org



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://www.utia.cas.cz/
CRCIM/home.html



fonds national de la recherche

FNR: Fonds National de la Recherche Luxembourg

Luxembourg's National Research Fund is a public establishment with scientific, financial and administrative autonomy, set up by the Law of 31 May 1999 in order to further stimulate research activities in Luxembourg.

To fulfil this mission, the Fund develops multi-annual research programs 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.crpgl.lu>

Centre de recherche public Henry Tudor
<http://www.tudor.lu>



Université du Luxembourg
<http://www.uni.lu>

Centre de recherche public de la santé
<http://www.crp-sante.lu>

Main research program in informatics

Security and efficiency of new practices in e-commerce (SE-COM)

Duration: 2001 - 2006
total budget: 7.500 000 €

To better master the new context of electronic cooperation, the SE-COM program will develop an integrated research on the safety of electronic exchange and on the efficiency of new organizational models and software for electronic cooperation.

European Research Consortium for Informatics and Mathematics
ERCIM
www.ercim.org



Contact:
Fonds National de la Recherche
20 Monté de la Pétrusse
L-2912 Luxembourg
Tel: +352 26 19 25-1
Fax: +352 26 19 25-34
<http://www.fnr.lu>

Belgium

FNRS Fonds National de la Recherche Scientifique - Wallonie

FWO Fonds voor Wetenschappelijk Onderzoek – Vlaanderen

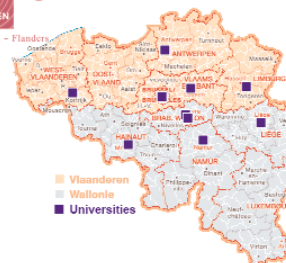


Research Foundation – Flanders

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.



Research Foundation – Flanders



FNRS

FNRS

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.

FNRS - Wallonie
rue d'Egmont 5
B - 1000 Brussels
Phone +32 2 504 92 11
Fax +32 2 504 92 92
mjsimoen@fnrs.be
www.fnrs.be

F.W.O.-Vlaanderen
Egmontstraat 5
1000 Brussels
Phone +32 2 512 91 10
Fax +32 2 512 58 90
post@fwo.be
www.fwo.be



ICS INSTITUTE OF COMPUTER SCIENCE FORTH FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS

Mission

The mission of 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. Towards achieving these objectives, ICS develops innovative products and services, contributes to the creation, transfer, and diffusion of technical know-how, collaborates with recognized companies, creates spin-off companies, promotes incubators and science and technology parks, and performs studies of regional, national and European interest.

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 emphasize the development of Information Society Technologies and infrastructures in a number of domains of national importance and regional interest.

Organisational Structure

Research Laboratories and Centers

- Computational Vision and Robotics Laboratory
- Computer Architecture and VLSI Systems Laboratory
- eHealth Laboratory
- Human- Computer Interaction Laboratory
 - Centre for Universal Access and Assistive Technologies
- Information Systems Laboratory
 - Centre for Cultural Informatics
- Telecommunications and Networks Laboratory.

Programmes

- Biomedical Informatics
- Information Security

Other Departments

- Department of Education and Training
- Department of Systems and Networks Administration
- Registry of [.gr] Domain Names

International Links



ERCIM: Member of ERCIM since 1992.



W3C: The W3C Office in Greece is hosted by ICS since 1998.

Budget

Annual Budget: approx. 8,5 million €

Staff

ICS employs a total of 250 people:

- 35 researchers and university faculty
- 100 technical personnel
- 20 administrative personnel & auxiliary personnel
- 95 graduate research assistants and trainees.



<http://www.ics.forth.gr>

The Institute of Computer Science is one of the seven institutes of the Foundation for Research and Technology - Hellas, a major national research centre, supervised by the General Secretariat for Research and Technology of the Hellenic Ministry of Development.



FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS (FORTH)
INSTITUTE OF COMPUTER SCIENCE

GR-700 13 Heraklion
Crete, Greece
TEL: +30 2810 391600
FAX: +30 2810 391601
EMAIL: ics@ics.forth.gr
URL: www.ics.forth.gr



Fraunhofer Gruppe
Informations- und
Kommunikationstechnik

The Fraunhofer ICT Group (Fraunhofer Group Information and Communication Technology) develops joint strategies and visions for application-oriented research on information and communication technology. It combines the core competencies of the 15 member and 2 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 complementing 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 needs.

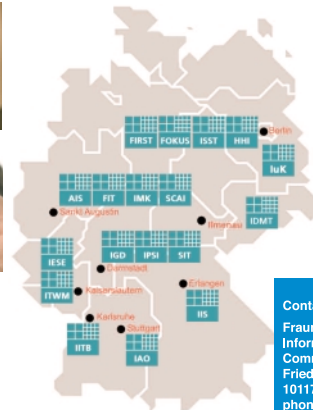


Information and Communication Technology for

- Medicine and Life Sciences
- Traffic, Transport and Mobility
- Production
- Digital Media
- Culture and Entertainment
- Software
- Communication Systems and Interdisciplinary Applications
- E-Business
- E-Government
- Security



- **Budget**
Annual budget:
approx. 176 million €
- **Staff**
Approx. 3000 scientific
and administrative staff



Locations of
the institutes
in Germany

Contact:
Fraunhofer Group
Information and
Communication Technology
Friedrichstr. 60
10117 Berlin
phone: +49 30 726 15 66 0
fax: +49 30 726 15 66 19
e-mail:
info@iuk.fraunhofer.de
www.iuk.fraunhofer.de



*Institut National de Recherche
en Informatique et en Automatique*

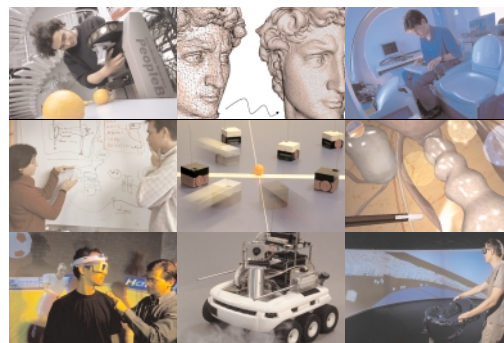
INRIA is the French National Institute for Research in Computer Science and Control, operating under the dual authority of the Ministry of Research and the Ministry of Industry. Its decentralized organization in six Research Units

- Futurs (Bordeaux, Lille, Saclay)
 - Lorraine
 - Rennes
 - Rhône-Alpes
 - Rocquencourt
 - Sophia Antipolis
- spread over France enables INRIA to network skills and talents from the fields of ICT.

INRIA headquarters are located in Rocquencourt. INRIA is a co-founder of ERCIM and hosts the ERCIM office.

■ **Mission**

- fundamental and applied research in mathematics, computer science and related topics
- designing prototypes and experimental systems
- technology and knowledge transfer
- promoting scientific international co-operation
- provide expertise.



■ **Co-operation and knowledge transfer**

The transfer of research results towards industry is one of INRIA's main assignments, in addition to its fundamental and applied research in computer science and control. This industrial transfer takes place at three different levels:

- contracts and partnership with industry (currently some 750 contracts)
- development initiatives
- the setting up of high-tech companies (some 80 companies since 1984).

■ **Research**

INRIA focuses its research on seven great research challenges for 2003-2007:

- designing and mastering the future network infrastructures and communication services platforms
- developing multimedia data and multimedia information processing
- guaranteeing the reliability and security of software-intensive systems
- coupling models and data to simulate and control complex systems
- combining simulation, visualization and interaction
- modeling living structures and mechanisms
- fully integrating ICST into medical technology.

■ **Budget**

Total annual budget:
135 million €, thereof

- 80% basic national funding
- 20% own resources.

■ **Staff**

- 2500 scientific staff including some 950 PhD students
- 650 supporting and administrative staff.



Contact:
INRIA
Domaine de Voluceau
BP 105
F-78153
Le Chesnay Cedex
France
Tel : +33 1 3963 5511
Fax : +33 1 3963 5330
email: info@inria.fr
http://www.inria.fr



The Irish Universities Consortium (IUC) represents the seven universities of Ireland. 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. At present, Dublin City University are responsible for administration and coordination activities.

Irish Universities Consortium

Research Themes

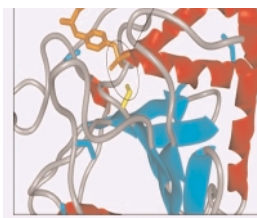
As all seven Irish Universities comprise the IUC, the range of research themes is exhaustive.

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 Interoperable Systems. The Centre for Digital Video Processing (CDVP) researches and develops techniques and tools to automatically analyse and index digital video information, and allow content-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, eco-and other hybrid sciences, finance, socio-economic phenomena, and many others. Much of the current focus of the work is in Biocomputation, (e.g. Bioinformatics and Biodiversity).



Contact:
IUC
co/School of Computing
Dublin City University
Glasnevin, Dublin 9,
Ireland
Tel: +3531 7005636
Fax: +3531 7005442
<http://ercim.computing.dcu.ie/>

European Research Consortium
for Informatics and Mathematics
ERCIM
www.ercim.org



NTNU

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

The research at NTNU is structured mainly through the basic organisation and five prioritised strategic research areas. The responsibility for ERCIM activities rests with the Faculty of Information Technology, Mathematics and Electrical Engineering (<http://www.ime.ntnu.no/eng/>). Some of the research activities will be co-ordinated within the framework of the strategic research area of Information and Communication Technology (ICT).

Collaborations

NTNU's research staff is continuously engaged in some 2000 R&D projects. In addition 20-30 major scientific conferences are hosted by NTNU every year. NTNU has bilateral agreements concerning student exchanges with more than 200 foreign universities. NTNU co-operates closely with SINTEF, a major independent European research institution with about 2,000 employees. SINTEF was established by the university and is located on the university campus. About 25% of the R&D projects of SINTEF are highly relevant to the ERCIM community.

The Faculty of Information Technology, Mathematics and Electrical Engineering

The Faculty has 270 academic staff and doctoral students and is responsible for around 20% of the educational activities at NTNU. The five strategic research areas are:

- Information and Communications Technology (ICT), with special focus on Web technology, and ICT and learning
- Materials Technology
- Medical Technology and MR
- Energy and Environment
- Marine and Maritime Technology.

Focus Area ICT-Web Technology

NTNU's prioritisation of ICT will ensure access to competent professionals for the ICT industry. The academic diversity at NTNU makes it possible to cover most aspects of ICT in research and teaching. The main areas are:

- computer supported co-operation
- information resources
- user interface
- software and system services
- information transport and networks
- electronics and hardware.



SonoWand, an ultrasound-based navigation system for image-guided key-hole surgery developed by MISON, a spin-off company from NTNU and SINTEF. They were awarded the prestigious European IST Grand Prize for the best IT product in Europe in December 2001.

NTNU main campus.



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.ntnu.no/>

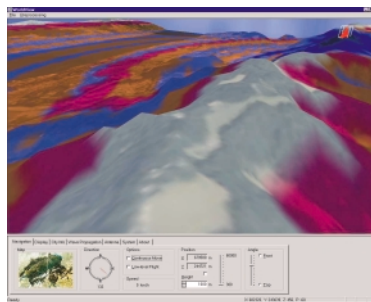
SARIT – The Swiss Association for Research in Information Technology



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



Automatic Antenna placement with WorldView.

SARIT organizes two series of conferences:

- the Swiss Computer Science Conference (SCSC), the last held on "Welcome to Multimodal Technologies" in Bern, February 5, 2004 and
- the CHIP (Swiss Informatics Professor) Conference, last held in Basel on February 17, 2005".

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 post-doctoral exchange program.

SARIT maintains offices at the Swiss Federal Institute of Technology (EPFL) in Lausanne.

European Research Consortium for Informatics and Mathematics
ERCIM
www.ercim.org



Contact:
SARIT Office
c/o Prof. Daniel Thalmann
EPFL-VR Lab
CH-1015 Lausanne

Tel: +41 21 693 52 14
Fax: +41 21 693 53 28
E-mail: info@sarit.ch
<http://www.sarit.ch/>



SpaRCIM

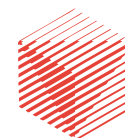
SpaRCIM was founded under the auspices of the Spanish Ministry of Education and Science. Its main goal is to spread the activities of the ERCIM consortium to the informatics and mathematics research communities within Spain. The consortium is composed of five universities and a research institute dependent on the Spanish Research Council (CSIC):

- . Artificial Intelligence Research Institute (IIIA)
- . Rey Juan Carlos University (URJC)
- . Technical University of Catalonia (UPC)
- . Technical University of Madrid (UPM)
- . Technical University of Valencia (UPV)
- . University of Malaga (UMA)

These Spanish institutions include a number of groups that are considered to be representative of Spanish research in computer science. These groups are working on a great variety of research areas within information technology and applied mathematics.



European Research Consortium for Informatics and Mathematics
ERCIM
www.ercim.org



Staff
About 450 researchers

Research Topics

- | | |
|-------------------------------------|---------------------------------|
| Complexity Theory | Databases |
| Automata | Distributed Systems |
| Logic | Operating Systems |
| Combinatorics | Image Processing |
| Computational Geometry | Distributed Systems |
| Parallel and Distributed Algorithms | Advanced Man-Machine Interfaces |
| Neural Networks | Data Visualization |
| Formal Linguistic | Computer Networks |
| Computer Graphics | Knowledge-based Systems |
| Software Engineering | Chaos Theory |
| Web Engineering | |

Contact

Spanish Research Consortium for Informatics and Mathematics.

Departamental II - Desp. 209
Rey Juan Carlos University
c/ Tulipán s/n. 28933 - Móstoles
Madrid, Spain

Pho - Fax: 34-91-664-74-91

contact@sparcim.org www.sparcim.org

The Swedish Institute of Computer Science

The Swedish Institute of Computer Science (SICS) is the leading research institute of Sweden in information and communication technology. 100 highly qualified researchers carry out research 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 has a well developed collaboration pattern with high-tech SMEs in Sweden.

■ Main Research Themes

Application areas

- Internet and mobility
- Industrial Information Technology
- Biotechnology.

Technology areas

- Infrastructure
- Network-based and Mobile Software Systems
- Security and Integrity
- Humans, usage and applications.

■ Examples of Recent Applications

- A scalable decentralized self-organizing P2P naming service with search capabilities.
- A service to attach virtual notes to real world locations, based on positioning technology.
- Optimization technology for global gene expression analysis
- Solutions to capacity problems in rail yard signalling design
- Competitive benchmarking of advanced e-trading technology
- Lightweight Internet protocol stack for remote control of TV-broadcasting equipment
- Tangible toolbox for managing future connected home services.



■ Budget

Turnover 9 million €.

■ Staff

100 researchers, thereof 35 PhDs.

■ Locations

Stockholm (Kista), Göteborg, Uppsala and Västerås.



Contact:
SICS
Isafjordsg. 22
Box 1263
S-164 29 Kista,
Sweden
Tel: +46 8 633 1500
Fax: +46 8 633 7230
Info @sics.se
http://www.sics.se



SRCIM – The Slovak Research Consortium for Informatics and Mathematics

SRCIM consists of five major Slovak R&D institutes active in informatics and mathematics, including three universities and two research institutes of the Academy of Sciences of the Slovak Republic.

■ Mission

SRCIM aims to advance research and development in IT in Slovakia through enhancing collaborative work among its member institutes and participation in the IT research and development in Europe.

■ Activities

- Research and education in informatics and mathematics
- Co-operation and coordination of research activities
- Expert advice to government bodies and industry
- Organization of conferences, workshops, seminars.



Comenius University, Faculty of Mathematics and Physics: The Mathematics Pavilion with the Statue of Copernicus.

■ Institutions of SRCIM

- Comenius University, Faculty of Mathematics, Physics and Informatics, Bratislava
- Slovak University of Technology, Faculty of Electrical Engineering and Information Technology, Bratislava
- Pavol Jozef Safarik University, Faculty of Science, Kosice
- Department of Informatics of the Institute of Mathematics, Slovak Academy of Sciences, Bratislava
- Institute of Informatics, Slovak Academy of Sciences, Bratislava.

■ Budget

Annual budget: 3 million € (estimation, taken for parts of the member institutes relevant for ERCIM)

- Basic national funding: 75%
- Participation in (inter)national research programmes and from contracts with industry: 25%.

■ Staff

250 employees in the member institutes relevant to SRCIM.



Contact:
SRCIM Office
MFF UK, Mlynská
dolina,
SK-842 15 Bratislava
Slovak Republic
Tel: +421 2 6542 6635
Fax: +421 2 6542 7041
E-mail: srcim@dcs.
fmph.uniba.sk
http://www.srcim.sk/





SZTAKI – Computer and Automation Research Institute Hungarian Academy of Sciences

SZTAKI is the Hungarian representative of ERCIM. SZTAKI was granted the prestigious title of EU Centre of Excellence in Information Technology, Computer Science and Control in 2001.



A new analogic cellular supercomputer system, a visual microprocessor, performs a trillion operations per second.

■ Mission

SZTAKI's mission is to carry out basic and application-oriented research in an interdisciplinary setting in the field of computer science, intelligent systems, process control, wide-area networking and multimedia. The activities cover the C³I – computing, control, communication and intelligence – quadruple. SZTAKI's mission includes the transfer of up-to-date results and research technology to university students and the Institute runs four external university departments.

■ Research Programme

- Computer Science and Information Technology
- Applied Mathematics
- Automated Control Systems
- Artificial Intelligence
- Analogical and Neural Computing
- Integrated Design and Control Systems.

■ Co-operation and Knowledge Transfer

SZTAKI has wide external relationships in its R&D profile. In addition to ERCIM the Institute is a member of the W3 Consortium, of the European Software Institute and of other international organizations. Researchers of SZTAKI contribute extensively to European scientific co-operation projects. Some research programmes are supported by US Agencies, including NSF, ARO and ONR.

■ Budget

Total annual budget: 14 million €

- Basic national funding: 34%
- Participation in (inter)national research programmes and from contracts with industry: 66%.

■ Staff

- researchers on payroll: 204
- supporting staff: 82

European Research Consortium for Informatics and Mathematics

ERCIM
www.ercim.org



W3C
OFFICE



Contact:
SZTAKI
P.O. Box 63
H-1518 Budapest

Tel: + 36 1 466 5644
Fax: +36 1 644 7503
<http://www.sztaki.hu/>



Technical Research Centre of Finland

VTT - Technical Research centre of Finland covers all the essential links in the ICT-value chain. The R&D fields of VTT Information Technology spans the spectrum from microelectronics and microsensing, wireless telecommunication networks to media technologies, information systems and

usability of IT systems and terminals. Part of the research is performed as large national and international projects, part is done as commissions for industry in order to support their own product development. Expertise for technically new solutions is obtained from VTT financed activities.

■ Core R&D VTT Information Technology

Semiconducting materials, micromechanics, measurement technology, sensors, integrated circuits, antennas, rf technology, photonics, networks, optical networking, traffic and performance analysis, mobility, switching and routing, location techniques, remote sensing, service platforms, ubiquitous computing, video/audio, usability, user interface and VR, wellness applications, multiple media, information carriers, data-mining, language engineering, product information management, transport management.

■ Recent applications

- A printed product and electronic services related to it, hybrid media, enables interactive communication and thus boosts the competitiveness of the product. VTT has developed techniques by which hybrid media services with camera phones can be realised. A 2D matrix code can be read from a printed product. The code is identified by a software that automatically contacts the embedded web address.
- TaigaMosaic — Radar image mosaic of Europe and the northern regions of Asia. The methods developed are based on up to four thousand kilometer long strips of images and photogrammetric block compensation. The mosaic construction contained not only calculating the image mosaic suited for the map co-ordinates, but also radiometric correction of the images. This is the first time this has been done. The mosaic covers the whole target area.
- Intelligent Mobile Video Environment designs and tests a new software toolkit, which enables the provision of a new range of intelligent video based services to end users in various mobile/wireless networks.

- Microfluidistic filter for gathering microparticles from a stream flow. The particle can be of sizes 1-200 µm. The developed filter enables the utilization of stationary phase diffusion in micro scale, which gives better measuring sensitivity in medicine development work.
- Algorithm for a swimming milometre that calculates the distance covered. It identifies the turns at the end of the pool from a 3D-compass file.

- The "Physical Browsing for Ambient Intelligence" project researched physical browsing, which means augmenting the physical environment with digital information. For example, hyperlinks may be added with different tags to physical objects, so that when someone points with a mobile phone to a tag integrated in a movie poster, the web pages of the movie open in the mobile phone.

■ VTT hosts Millilab

Millilab is an External laboratory on Millimetre Wave Technology. The main purpose of MilliLab is to support European space industry to meet the demands of future ESA missions. Non-space companies and organizations use our expertise on millimetre wave technology as well.

■ Staff

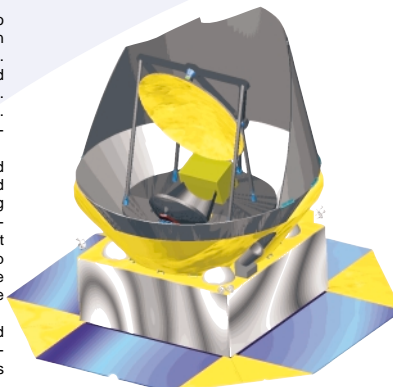
VTT: 2982
VTT Information Technology: 450.

■ Budget

Turnover VTT 219 million €

Turnover VTT Information Technology: 38 million €

- Budget funding 34%
- Income from the private sector 30%
- Income from the public sector 26%
- Income from abroad 10%.



Ultra low noise 70 GHz receiver.

Virtual Reality application at VTT.



European Research Consortium for Informatics and Mathematics

ERCIM
www.ercim.org



Contact:
Technical Research Centre of Finland
P.O. Box 1200,
FIN-02044 VTT
Finland

Tel: +358 9 456 6041
Fax: +358 9 456 6027
<http://www.vtt.fi/tte>

Scientific Fields of Competences

		AAIT	CCIRC	ISTI-CNR	CRDIM	CWIL	FIG	FNR	FNRS & FWO	ICS-FORTH	INRIA	IUC	NTNU	SARIT	SICS	SparCIM	SRDIM	SZTAKI	VTT
Informatics B. Hardware	B.1 CONTROL STRUCTURES AND MICROPROGRAMMING (D.3.2)						X	X	1					X			X		
	B.2 ARITHMETIC AND LOGIC STRUCTURES					X	X			X	X			X					
	B.3 MEMORY STRUCTURES						X		1	X	X			X					
	B.4 INPUT/OUTPUT AND DATA COMMUNICATIONS						X		1	X			X	X	X				X
	B.5 REGISTER-TRANSFER-LEVEL IMPLEMENTATION						X		1	X				X					
	B.6 LOGIC DESIGN				X	X	X	2	X				X	X					
	B.7 INTEGRATED CIRCUITS				X	X	X	4	X				X	X			X		X
	B.8 PERFORMANCE AND RELIABILITY (C.4)						X	X	3	X			X	X					
C. Computer Systems Organization	C.1 PROCESSOR ARCHITECTURES				X	X	X	3	X	X		X	X						
	C.2 COMPUTER-COMMUNICATION NETWORKS	X	X	X	X	X	X	5	X	X	X	X	X	X	X		X	X	X
	C.3 SPECIAL-PURPOSE AND APPLICATION-BASED SYSTEMS (J.7)	X	X				X	X	X	X	X	X	X	X					
	C.4 PERFORMANCE OF SYSTEMS	X		X	X	X	X	4	X	X		X	X	X					X
	C.5 COMPUTER SYSTEM IMPLEMENTATION	X					X		1	X	X	X	X						
D. Software	D.1 PROGRAMMING TECHNIQUES (E)	X	X	X	X	X	X	6	X	X	X	X	X	X	X	X	X	X	X
	D.2 SOFTWARE ENGINEERING (K.6.3)	X	X	X	X	X	X	8	X	X	X	X	X	X	X	X	X	X	X
	D.3 PROGRAMMING LANGUAGES	X		X	X	X	X	6	X	X		X	X	X	X	X			X
	D.4 OPERATING SYSTEMS (C)	X		X	X	X	X	2	X	X		X	X	X	X	X			X
E. Data	E.1 DATA STRUCTURE	X	X	X	X	X	X	5	X	X		X	X	X	X	X	X		
	E.2 DATA STORAGE REPRESENTATIONS	X	X	X			X	2	X	X	X	X	X	X	X				
	E.3 DATA ENCRYPTION	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X			X
	E.4 CODING AND INFORMATION THEORY (H.1.1)	X		X	X	X	X	3	X		X	X	X	X	X				X
	E.5 FILES (D.4.3, F.2.2, H.2)	X	X	X	X			1		X			X						
F. Theory of Computation	F.1 COMPUTATION BY ABSTRACT DEVICES	X		X	X			2	X	X			X	X			X		
	F.2 ANALYSIS OF ALGORITHMS AND PROBLEM COMPLEXITY (B.6, B.7, F.1.3)	X	X	X	X		X	6	X	X		X	X	X	X		X	X	
	F.3 LOGICS AND MEANINGS OF PROGRAMS	X	X		X		X	4		X	X	X	X	X	X				
	F.4 MATHEMATICAL LOGIC AND FORMAL LANGUAGES	X			X	X	X	8	X	X	X	X	X	X	X	X	X	X	X
G. Mathematics of Computing	G.1 NUMERICAL ANALYSIS (MSC 65, 33-35)	X		X	X	X	X	7	X		X	X	X	X	X	X	X	X	X
	G.2 DISCRETE MATHEMATICS (MSC 05, 06)	X		X	X	X	X	4	X	X	X		X	X	X	X	X	X	X
	G.3 PROBABILITY AND STATISTICS (MSC 60, 62)	X	X	X	X	X	X	6	X	X	X		X	X	X	X	X	X	X
	G.4 MATHEMATICAL SOFTWARE				X	X	X	5		X		X	X	X	X	X		X	X
H. Information Systems	H.1 MODELS AND PRINCIPLES	X	X	X	X	X	X	4		X	X	X	X	X	X	X	X	X	X
	H.2 DATABASE MANAGEMENT (E.5)	X	X	X	X	X	X	5	X	X	X	X	X	X	X	X	X	X	X
	H.3 INFORMATION STORAGE AND RETRIEVAL	X	X	X	X	X	X	5	X	X	X	X	X	X	X	X	X	X	X
	H.4 INFORMATION SYSTEMS APPLICATIONS	X	X	X	X	X	X	5	X	X		X	X	X	X	X	X	X	X
	H.5 INFORMATION INTERFACES AND PRESENTATION (e.g., HCI) (I.7)	X	X	X	X	X	X	4	X	X	X	X	X	X	X	X	X	X	X
I. Computing Methodologies	I.1 SYMBOLIC AND ALGEBRAIC MANIPULATION						X	4		X			X	X	X		X		
	I.2 ARTIFICIAL INTELLIGENCE	X	X	X	X	X	X	6	X	X	X	X	X	X	X	X	X	X	X
	I.3 COMPUTER GRAPHICS	X	X	X	X	X		4	X	X	X	X	X	X	X	X	X	X	X
	I.4 IMAGE PROCESSING AND COMPUTER VISION	X	X	X	X	X		8	X	X	X		X	X	X	X	X	X	X
	I.5 PATTERN RECOGNITION	X	X	X	X	X	X	6	X	X	X		X	X	X	X	X	X	X
	I.6 SIMULATION AND MODELING (G.3)	X	X	X	X	X	X	5		X	X	X	X	X					X
	I.7 DOCUMENT AND TEXT PROCESSING (H.4, H.5)	X	X	X	X	X	X	3		X	X		X	X	X	X	X	X	X
J. Computer Applications	J.1 ADMINISTRATIVE DATA PROCESSING	X	X				X	1					X				X	X	
	J.2 PHYSICAL SCIENCES AND ENGINEERING	X	X		X	X	X	2	X	X	X		X	X	X	X	X	X	
	J.3 LIFE AND MEDICAL SCIENCES	X	X	X	X	X	X	6	X	X	X	X	X	X	X	X	X	X	X
	J.4 SOCIAL AND BEHAVIORAL SCIENCES	X			X	X	X		X	X	X		X				X		
	J.5 ARTS AND HUMANITIES	X	X	X	X	X	X	X		X			X	X	X		X		
	J.6 COMPUTER-AIDED ENGINEERING	X	X	X		X	X	X	3	X	X	X	X	X			X	X	X
	J.7 COMPUTERS IN OTHER SYSTEMS (C.3)	X						X		X	X		X	X	X		X		
K. Computing Milieux	K.1 THE COMPUTER INDUSTRY									X				X					
	K.2 HISTORY OF COMPUTING	X			X			1		X	X								
	K.3 COMPUTERS AND EDUCATION	X	X		X		X	3	X	X	X		X	X		X	X		
	K.4 COMPUTERS AND SOCIETY	X					X	1	X	X	X	X	X						
	K.5 LEGAL ASPECTS OF COMPUTING								1					X					
	K.6 MANAGEMENT OF COMPUTING AND INFORMATION SYSTEMS	X	X				X	2			X		X	X	X	X	X		
	K.7 THE COMPUTING PROFESSION													X	X				
	K.8 PERSONAL COMPUTING	X								X				X	X				

The categories used for the informatics part of the ERCIM table of competences are the top two levels of the internationally accepted ACM Computing Classification System [1998 Version]. The ERCIM table subsumes more detailed distinctions available from the full ACM CCS (<http://www.acm.org/class/>) which includes additional levels of description.

FNRS-FWO: The figures in brackets refer to the number of Belgian institutes active in this field.

Mathematics

	AART	CCLRC	ISTI-CNIR	CRCIM	CMI	ENR	ENR	ENR	ENR & EWO	ICS-FORTH	INRIA	IJC	NTNU	SART	SICS	SparCIM	SRCIM	SZTAKI	VTT
00 General				X	X	X		2						X	X				
01 History and biography				X										X			X		
03 Mathematical logic and foundations				X	X			5			X	X		X	X	X	X		
05 Combinatorics				X	X	X		2	X	X				X	X	X	X	X	
06 Order, lattices, ordered algebraic structures	X			X				2	X					X		X	X	X	
08 General algebraic systems	X			X				1	X					X		X			
11 Number theory				X	X			2						X					X
12-22 Algebra				X		X		5	X	X	X	X		X		X	X		
26 Real functions						X		1			X	X		X			X		
28 Measure and integration								1	X					X				X	
30 Functions of a complex variable						X		3				X	X						
31 Potential theory												X	X						
32 Several complex variables and analytic spaces								1	X	X	X							X	
33 Special functions					X					X	X	X							
34 Ordinary differential equations				X	X	X		4	X	X	X	X							X
35 Partial differential equations				X	X	X		5	X	X	X	X					X	X	
37 Dynamical systems and ergodic theory				X		X		3	X	X	X	X					X	X	
39 Difference and functional equations						X		3	X			X							
40 Sequences, series, summability												X	X						
41 Approximations and expansions					X	X		1	X	X	X	X							X
42 Fourier analysis						X		4	X	X	X	X							X
43 Abstract harmonic analysis						X		1				X	X						X
44 Integral transforms, operational calculus								2					X						
45 Integral equations						X		1	X			X							
46 Functional analysis				X	X			5	X	X	X								
47 Operator theory				X				2				X	X						
49 Calculus of variations and optimal control; optimization				X	X	X		4	X			X	X		X	X	X	X	
51 Geometry				X		X		2				X	X						X
52 Convex and discrete geometry					X	X							X						X
53 Differential geometry				X	X			2				X	X				X	X	
54 General topology						X				X		X							X
55 Algebraic topology	X							1	X	X	X	X		X	X	X	X	X	
57 Manifolds and cell complexes								1				X	X						X
58 Global analysis, analysis on manifolds								2				X	X						
60 Probability theory and stochastic processes				X	X	X	X	5	X	X	X	X	X	X	X	X	X	X	
62 Statistics				X	X	X	X	6	X	X	X	X	X	X	X	X	X	X	
65 Numerical analysis				X	X	X		6	X	X	X	X	X	X	X	X	X	X	
70-86 Mathematical Physics	X			X	X	X		1				X	X						
90 Operations research, mathematical programming				X	X	X	X	5	X	X		X	X	X	X	X	X	X	
91 Game theory, economics, social and behavioral sciences				X	X	X	X	5	X			X		X				X	X
92 Biology and other natural sciences				X	X	X	X	3	X	X	X	X	X	X	X				X
93 Systems theory; control	X	X		X	X	X	X	5	X			X		X					X
94 Information and communication, circuits								3	X		X	X							
97 Mathematics education				X	X			2						X			X		

ERCIM
BP 93
2004, Route des Lucioles
F-06902 Sophia-Antipolis Cedex, France

Tel: +33 4 92 38 50 10
Fax: +33 4 92 38 50 11
office@ercim.org
<http://www.ercim.org/>