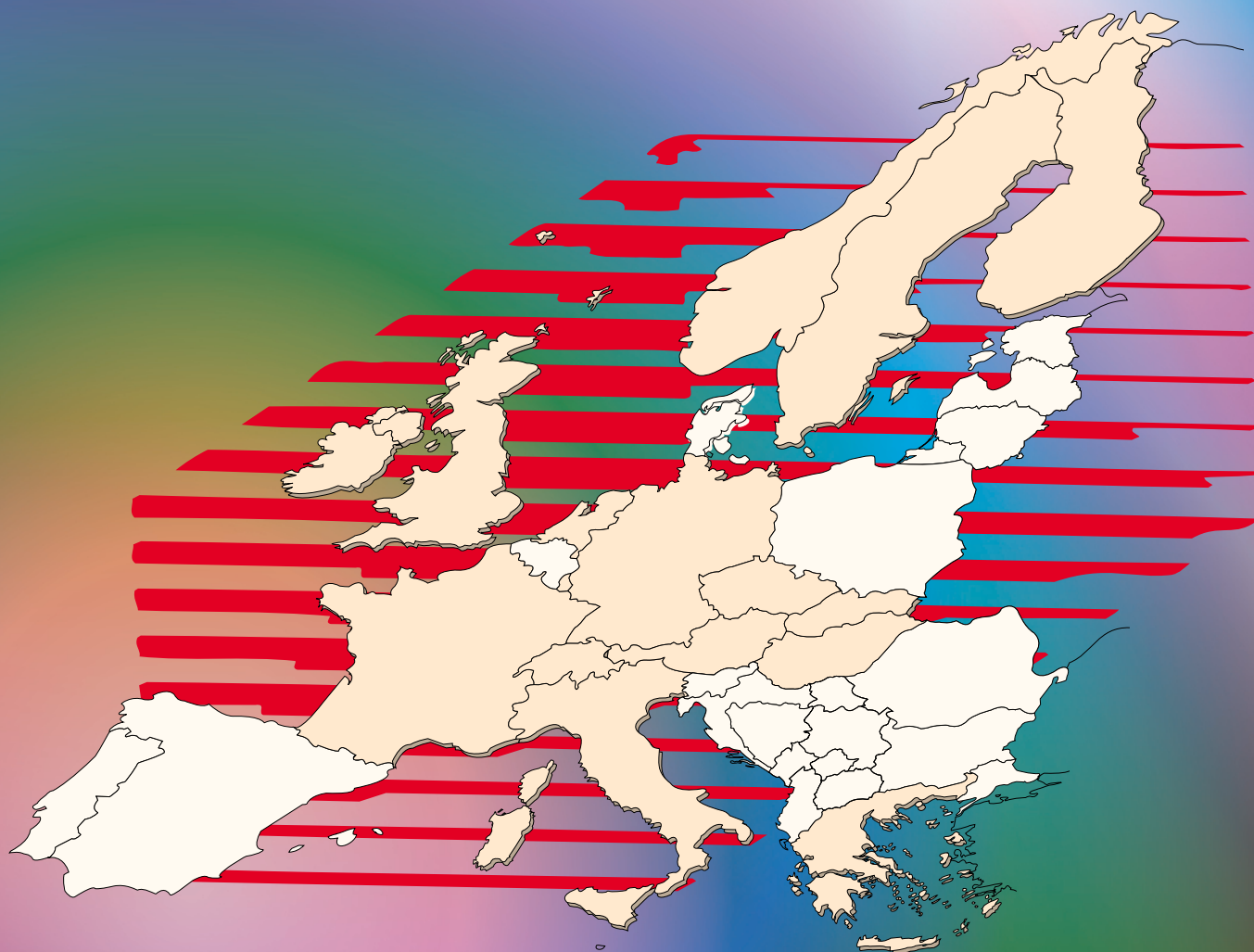European Research Consortium
for Informatics and Mathematics

ERCIM

www.ercim.org

Annual Report 2002

Contents

Foreword from the President

Since its inception, ERCIM has worked to develop a strong ICT research network in Europe, and in this regard, 2002 has been a milestone year. The membership and geographical reach of ERCIM has grown such that it currently includes sixteen member institutes. Two new members joined ERCIM in 2002: NTNU, the Norwegian University of Technology, and the Luxembourg Research Fund (FNR).

During 2002, ERCIM became the European host of the World Wide Web Consortium (W3C). W3C is leading the implementation of the Semantic Web vision and the standardisation of Web Services Technologies. ERCIM member institutes have been active in W3C Working Groups, and several act as local W3C offices. As a network of IT research centres, ERCIM encompasses over ten thousand researchers. Not only will W3C benefit from this reservoir of expertise, but for ERCIM, this change represents a major step forward in its development, and offers an opportunity to enhance global cooperation.

ERCIM has strengthened its links with the US National Science Foundation by continuing the series of joint European-NSF strategic research workshops. Furthermore, an agreement for strategic cooperation was recently signed with the European Science Foundation. In May, a workshop was jointly organised by ERCIM and the Standing Committee for the Physical and Engineering Sciences of ESF to discuss possibilities for future collaboration between the two organisations.

The ERCIM PhD Fellowship Programme was again very successful, with seventeen fellows from all over the world starting fellowships in ERCIM institutes. ERCIM runs a dozen Working Groups on specific research themes, and participates in an equal number of European projects.

ERCIM's quarterly newsletter ERCIM News enjoys increasing popularity, and has established itself as a leading European publication on research in ICT and related fields. The four issues for 2002 focused on information security, e-mathematics, the Semantic Web and embedded systems.

The creation of the European Research Area will be stimulated by the European Commission through actions in the 6th and 7th Framework Programmes. To ensure that it becomes a practical reality however, it is necessary to build pan-European institutions in many research disciplines. ERCIM may be seen as one example of such an institution, and its legal status, choice of activities and links to other organisations could serve as a model for other disciplines. ERCIM is fully committed to the ideal of a European Research Area and will actively contribute to the realisation of a strong information society in Europe.

Gerard van Oortmerssen

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 sixteen European countries. Encompassing over 10,000 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).
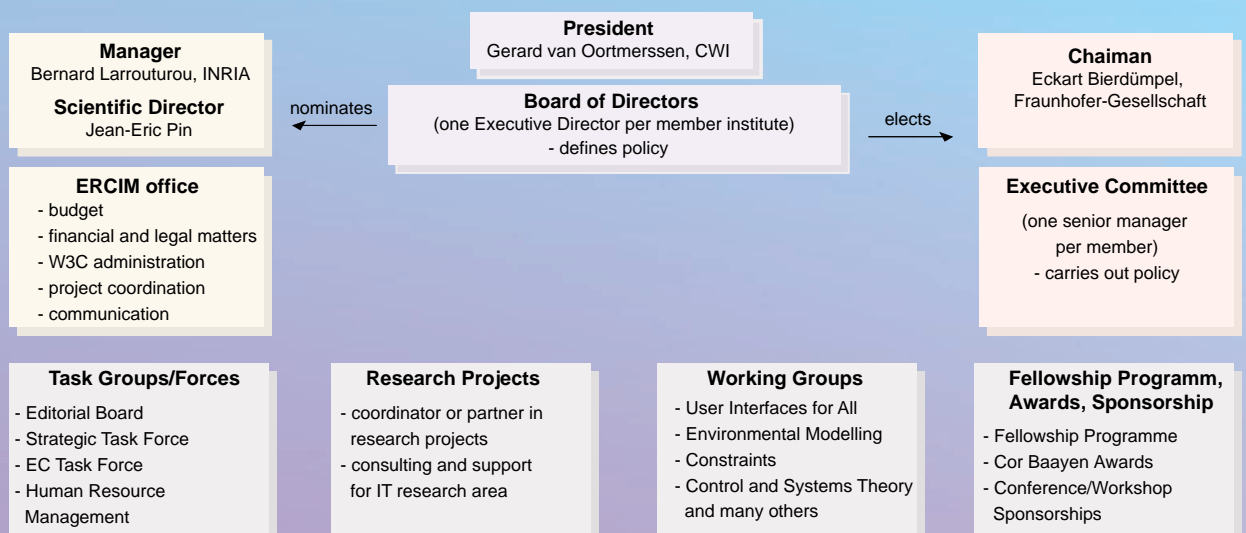
Objectives

ERCIM's aim is to play a leading role in Information and Communication Technolonies in Europe by:

• building a Europe-wide, open network of centres of excellence in Information and Communication Technologies (ICT). 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 World Wide Web Consortium, participates in EU activities, and has established cooperations with both the European Science Foundation and the US National Science Foundation. ERCIM also administers European research projects involving partners from China, Africa and South America.

President
Gerard van Oortmerssen, CWI

Manager
Bernard Larrouturou, INRIA

Scientific Director
Jean-Eric Pin

← nominates

Board of Directors
(one Executive Director per member institute)
- defines policy

elects →

Chaiman
Eckart Bierdümpel,
Fraunhofer-Gesellschaft

ERCIM office
- budget
- financial and legal matters
- W3C administration
- project coordination
- communication

Executive Committee
(one senior manager per member)
- carries out policy

Task Groups/Forces
- Editorial Board
- Strategic Task Force
- EC Task Force
- Human Resource Management

Research Projects
- coordinator or partner in research projects
- consulting and support for IT research area

Working Groups
- User Interfaces for All
- Environmental Modelling
- Constraints
- Control and Systems Theory and many others

Fellowship Programm, Awards, Sponsorship
- Fellowship Programme
- Cor Baayen Awards
- Conference/Workshop Sponsorships

Organizational structure of ERCIM.

Institute	Board of Directors	Executive Committee
AARIT (Austria)	Günter Koch	Hans-Peter Axmann
CLRC (UK)	Keith Jeffery	Michael Wilson
CNR (Italy)	Piero Maestrini	Costantino Thanos
CWI (The Netherlands)	Gerard van Oortmerssen	Dick Broekhuis (Barry Koren until September 2002)
CRCIM (Czech Republic)	Jiri Wiederman	Lubos Brim
FNR (Luxembourg)	Eric Dubois	Nicolas Guelfi (Raymond Bausch until September 2002)
FORTH (Greece)	Stelios Orphanoudakis	Constantine Stephanidis
FhG (Germany)	Ulrich Trottenberg	Eckart Bierdümpel
INRIA (France)	Bernard Larrouturou	Jean-Pierre Banâtre (Georges Nissen until July 2002)
NTNU (Norway)	Arne Solvberg	Finn Arve Aagesen
SARIT (Switzerland)	Kurt Bauknecht	Christine Vanoirbeek
SICS (Sweden)	Gunnar Bjurel	Janusz Launberg
SRCIM (Slovakia)	Branislav Rovan	Peter Vojtas (Vladislav Hluchy until January 2003)
SZTAKI (Hungary)	Péter Inzelt	László Monostori
Irish Universities Consortium (Ireland)	Pádraig Cunningham	Heather Ruskin
VTT (Finland)	Pekka Silvennoinen	Seppo Linnainmaa

ERCIM representatives.

Members

A member institute must be a leading research establishment in its country, with excellent links to both the national and international research communities. ERCIM has one member institute per country. In January 2003 ERCIM had sixteen members; this number is expected to grow. 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.

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 2001, ERCIM was involved in nine 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 program. Working Groups have been created in areas such as Applications of Numerical Mathematics in Science, Constraints, Control and System Theory, E-Learning, Dependable Software-Intensive Systems, Environmental Modelling, Formal Methods for Industrial Critical Systems, Health and Information Technology, Image and Video Understanding, Matrix Computations and Statistics, User Interfaces for All, and Soft Computing.

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 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.

Consultancy

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

Publications

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

Important Events

W3C WORLD WIDE WEB consortium ®

ERCIM New European Host of W3C

The change of W3C European Host from INRIA to ERCIM took place on 1 January 2003. This organisational change aims to strengthen research relationships throughout Europe to better support Web technology development.

Tim Berners Lee, Director of W3C (left) and Gerard van Oortmerssen, President of ERCIM.

As the Web has grown into a more widespread and essential resource for industry, academia, governments, and their citizens, there is a pronounced need for an even more diverse infrastructure and support network. Establishing the W3C's European base at ERCIM will be beneficial to all involved. W3C's move to ERCIM opens new opportunities to integrate Web research and industry in Europe.

"The Web grows stronger and more useful when there are real commitments to engaging international presence and influence in Web technology development," explained Tim Berners-Lee, W3C Director. "For W3C, it means having one headquarters supported by three global partners — MIT, Keio University and now ERCIM. With the move to ERCIM, there is the potential for considerable growth and synergies of Web technologies across Europe."

"As a network of IT research centers, ERCIM encompasses over 10,000 researchers. W3C will benefit from this reservoir of expertise. For ERCIM, this change brings an opportunity to enhance cooperation on a global scale," noted Gerard van Oortmerssen, President of ERCIM.

Since its inception in the United States at MIT's Laboratory for Computer Science in October 1994, W3C has made sure that the World Wide Web lives up to its name and its promise. At the insistence of its Director, Tim Berners-Lee, the W3C has equal presence in North America, Europe and Asia. W3C identifies not-for profit institutions to serve as regional headquarters and provide physical locations for staffing. These institutions are identified as W3C 'hosts'. Moving the European host to ERCIM allows W3C to expand its base from one country to 16 for improved research and development opportunities throughout Europe, while maintaining its historically strong relationship to INRIA, one of the ERCIM founders.

"INRIA provided the necessary foundations for European involvement in Web infrastructure development, and now we have the opportunity to expand into a new phase," explained Bernard Larrouturou, President of INRIA and Manager of ERCIM. "Moving the host to ERCIM is consistent with INRIA's culture of incubating new initiatives and our commitment to strengthening the IT community in Europe." When INRIA became the first W3C European host in 1995, W3C had 50 Members in four countries. Today, the W3C Membership exceeds 450 organizations, with representation in nearly every country in Europe. INRIA's resources attracted both member organisations and technical staffing to W3C. INRIA also provided crucial links to European research communities. During this time, W3C received financial support from the European Commission to build a network of Offices throughout Europe. Currently, W3C has 13 Offices worldwide, with eight in Europe. Seven of the European Offices are already 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). Offices work with W3C hosts promoting local languages, broadening W3C's geographical base, and encouraging international participation in W3C Activities.

FNR and NTNU joined ERCIM

NTNU, the Norwegian University of Science and Technology became ERCIM's Norwegian member in January 2002. FNR, the Luxembourg National Research Fund, (Fonds National de la Recherche) joined ERCIM in July 2002.

NTNU

NTNU now represents in ERCIM 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. Membership was established with support from The Research Council of Norway. 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. Some of the research activities will be co-ordinated within the framework of the strategic research area of Information and Communication Technology (ICT). (http://www.ntnu.no/satsingsomraader/ikt/english.htm)

NTNU is the major centre for technological education and research in Norway. Traditions in natural sciences and technology are interwoven with broadly based expertise in the classical university disciplines of the humanities, medicine and the social sciences. The Norwegian Institute of Technology (NTH), founded in 1910 is now an integral part of NTNU.

A specific ambition is to promote cross-disciplinary interplay between all forms of human intellectual activities, the arts, the natural and social sciences and technology. This is considered to be of particular importance when exploiting the opportunities of ICT in promoting the information society and innovations for industrial development.

http://www/ime.ntnu.no/eng/

FNR

The National Research Fund is a public establishment with scientific, financial and administrative autonomy. The Fund develops multi-year research programs and assures their implementation by allocation of the financial means put at its disposal.

Five national multi-year priority programs are currently ongoing, among them 'Security and efficiency of new practices in e-commerce for all socio-economic actors (SE-COM)', which has a budget of 7,500,000 Euro for five years. In addition, the National Research Fund subsidises accompanying measures to strengthen the general framework of scientific research in Luxembourg, eg subsidising the organisation of scientific conferences and the mobility of researchers.

In ERCIM, the National Research Fund represents researchers in Luxembourg working in informatics and mathematics at the following institutions:
- The CRP-Santé
- The CRP-Gabriel Lippmann
- The CRP-Henri Tudor
- The Centre Universitaire
- The Institut Supérieur de Technologie.

The implementation of a new University of Luxembourg with a major focus on research activities is currently in preparation and a new law will restructure the institutions of higher education in Luxembourg.

http://www.fnr.lu/

NTNU main campus with Trondheim city center in the righ hand background.

Research in Luxembourg.

Cooperations

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. Leading research institutes from sixteen European countries are members of ERCIM. 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 does not undertake research itself, but ancillary activities addressing co-operation, strategic planning, and technology transfer.

The main activities that ERCIM undertakes 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 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 (OGSA) 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 on 1st January 2003 ERCIM took over the role of European host organisation for the World Wide Web Consortium (W3C) from one of its member institutes INRIA in France. 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 lead 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.

Towards a Strategic Cooperation with the European Science Foundation

Discussions between representatives from the European Science Foundation (ESF) and ERCIM have led to a proposal for cooperation between the two organisations. Both organisations have signed a Memorandum of Understanding, and an exploratory workshop was organised to develop a joint vision for the future of e-Science. This workshop took place at CWI in Amsterdam on 30-31 May 2002.

The main thrust of the workshop was to investigate jointly a vision for information technology (IT) in Europe. Twelve experts from ERCIM and twelve from ESF were invited to discuss important research areas for the future, to analyse strengths, weaknesses, opportunities and threats for European research and to make recommendations to ERCIM, ESF and the European Union. To take into account the interdisciplinary and applied aspects of computer science, four discussion groups were constituted, namely:

- Mathematics/Computer Science Interdisciplinary Group
- Emerging Applications in the Sciences
- ICT Services for User Communities
- Advanced Communication Technologies and Scientific Computation

A common recommendation by the four discussion groups was that ESF be assisted in IT through the use of ERCIM's pool of experts. It was also agreed that ESF and ERCIM jointly offer their expertise and advice to the European Commission. Scientists from ERCIM and ESF domains should also cooperate on projects in the sixth EC Framework Programme.

This meeting was a first step towards ESF/ERCIM cooperation in the fields of computer science and applied mathematics. A detailed report on the workshop will be presented to ESF's PESC committee and executive board and to ERCIM's board, as well as to Philippe Busquin, the European Commissioner for Research. The full report is available on ERCIM's Web site.

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

EU-NSF Strategic Research Workshops

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 2002, three workshops were held. These were Middleware for Mobile Systems, Vienna, 1-2 July 2002; Digital Human Ontologies, Bethesda, USA, 25-26 July 2002 and Interdependencies, Washington, USA, 23-24 September 2002.

This series of strategic workshops, having commenced in 2001, is expected to continue in 2003, possibly extending to include newly identified research priorities. Details and workshop reports are available on the project Web site.

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

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 in 2002: 'Software Computing', 'Image and Video Understanding' and 'Dependable Software-Intensive Sysytems'.

The activities of a working group can be subdivided into three areas:
• workshops
• project proposals
• mobility and fellows.

A working group receives support in the form of initial seed money, on application to the ERCIM Executive Commmittee, 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.

A working group is also the focus of internal mobility within ERCIM. 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 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 2002 Award was the Working Group "Environmental Modelling".

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

Current ERCIM Working Groups

■ **Applications of Numerical Mathematics in Science**
Coordinator: Mario Arioli, CLRC
Workshop: Computational Linear Algebra with Applications, Milovy, Czech Rebulic, 4-8 August 2002.

■ **Constraints**
Coordinator: François Fages, INRIA
Workshop: Joint Workshop of the ERCIM Working Group on Constraints and the CologNet area on Constraint and Logic Programming on Constraint Solving and Constraint Logic Programming, Cork, Ireland, 19-21 June 2002.

■ **Control and System Theory**
Coordinator: Jan van Schuppen, CWI.

■ **Dependable Software-Intensive Systems**
Coordinator: Erwin Schoitsch, Austrian Research Centers Seibersdorf (AARIT)
Workshop: AMSD – ARTIST Joint Workshop on Dependable Embedded Systems (co-organized with the ERCIM Working Group by ARC Seibersdorf Research), Grenoble, France, 3 October 2002.

■ **E-learning**
Coordinator: Sepideh Chakaveh, FhG.

■ **Environmental Modelling**
Coordinator: Achim Sydow, FhG
Workshop: 9th ERCIM Environmental Modelling Group Workshop on Environmental GRID Computing, Lugano, Switzerland, 26-27 June 2002
Project: The EC-funded joint ERCIM project 'DECAIR' was terminated in May 2002.
Award: The group received the 2002 ERCIM Working Group award.

■ **Formal Methods for Industrial Critical Systems**
Coordinator: Stefania Gnesi, CNR
Workshop: 7th International ERCIM Workshop on Formal Methods for Industrial Critical Systems, Malaga Spain, 12-13 July 2002.
ERCIM PhD Fellows: Gordon Pace (INRIA), Maurice Ter Beek (SZTAKI and CNR).

■ **Health and Information Technology**
Coordinator: Manolis Tsiknakis, FORTH

■ **Image and Video Understanding**
Coordinator: Eric Pauwels, CWI
ERCIM PhD Fellows: Charith Abhayaratne (CWI and INRIA), Alin Achim (CNR and INRIA).

■ **Matrix Computations and Statistics**
Coordinator: Bernard Philippe, INRIA
Workshops: Second Matrix Computations and Statistics Workshop, Rennes, 14-15 February, 2002; Third Matrix Computations and Statistics Workshop, Neuchâtel, Switzerland, 9-10 November 2002 (organized jointly with the 2nd international workshop on 'Parallel matrix algorithms and applications'.
ERCIM PhD Fellows: Marios Fyrillas (INRIA and SARIT (University of Neuchatel)).

■ **Soft Computing**
Coordinator: Petr Hajek, Institute of Computer Science, Academy of Sciences of the Czech Republic (CRCIM).
Workshop: Third Workshop on Soft Computing (inconjunction with SOFSEM 2002), Milovy, Czech Republic, 28-29 November 2002

■ **User Interfaces for All**
Coordinator: Constantine Stephanidis, FORTH
Workshop: 7th ERCIM WG UI4ALL Workshop, Chantilly, France, 23-25 October 2002.

Dependable Software-Intensive Systems

The dependability aspect of embedded systems is of the utmost importance, and ERCIM members have identified a huge potential with respect to this. Accordingly, the new ERCIM member AARIT, within which ARCS is an important driving force, has proposed and initiated an ERCIM Working Group on 'Dependable Software-Intensive Embedded Systems'.

Each day, our lives become more dependent on 'embedded systems', digital information technology that is embedded in our environment. This includes not only safety-critical applications such as automotive devices and controls, railways, aircraft, aerospace and medical devices, but also communications, 'mobile worlds' and 'e-worlds', the 'smart' home, clothes, factories etc. All of these have wide-ranging impacts on society, including security, privacy and modes of working and living. More than 98% of processors applied today are in embedded systems, and are no longer visible to the customer as 'computers' in the ordinary sense. New processors and methods of processing, sensors, actuators, communications and infrastructures are 'enablers' for this very pervasive computing. They are in a sense ubiquitous, that is, almost invisible to the user and almost omnipresent.

The European Context
The European Commission has recognised the importance of embedded systems by creating a new unit in the IST Directorate. The visions surrounding the AMI-space (embedded systems everywhere, described in the context of human life as 'ambient intelligence') have considerably influenced the 6th Framework Programme of the IST domain. In this issue we focus on hard real-time, dependability/safety and AMI-scenario applications. There also exists a separate strategic objective on embedded systems in the work program 2003-2004, namely, to develop the next generation of technologies and tools for modelling, design, implementation and operation of hardware/software systems embedded in intelligent devices. An end-to-end systems vision should allow cost-efficient systems to be built with optimal performance, high confidence, reduced time to market and faster deployment. The focus is on:
- Middleware and platforms for building networked embedded systems that aim to hide the complexity of underlying computing, communications, sensing and control, while at the same time providing efficient and effective distribution of resources at low cost
- Concepts, methods and tools for system design and development of warrantable software components and implementation of systems
- Advanced controls for real-time systems.

This strategic objective is covered in the second call (15 June to 15 October 2003). The Working Group is involved in a large IP proposal (Integrated Project, one of the new instruments of European funded research) called DECOS, Dependable Embedded Components and Systems.

The Working Group currently includes members from Austria (ARCS/AARIT), France (INRIA), Germany (FhG), Greece (FORTH), Italy (CNR, PDCC), Luxembourg (IST), Netherlands (CWI), Norway (NTNU) and Sweden (MRTC/SICS). Others are very welcome.

At the moment, all themes relating to embedded systems are of interest to the Working Group (WG), which focuses on specific topics case by case. The work program includes:
- experience exchange
- joint position papers on relevant issues
- information exchange with organisations, other WGs and committees in which ERCIM members are already active
- decision building processes
- WG meetings adjacent to other relevant meetings/conferences
- discussion board (via ERCIM website or a member's website)
- contributions to ERCIM News
- one major event per year (may be combined with some important meeting or conference)
- cooperation within the EU Framework Programs (NoE, IP); currently Dependability (1st Call) and Embedded Systems (2nd Call)
- cooperation in standardisation and awareness-building processes.

Image and Video Understanding

To focus the efforts of several ERCIM partners in high-level vision and image processing, a Working Group on Image and Vido Understanding was established in 2002.

Due to the convergence of various technologies, capturing, storing and manipulating images or video has become inexpensive and straightforward. As a consequence, imagery is rapidly reclaiming prominence in our digital information society and is responsible for a major portion of the stored and streamed data. However, the sheer amount and inherent complexity of visual data make the automatic extraction of useful knowledge a daunting task. Breakthrough progress in this area will depend on the development of genuine image and video understanding: i.e. soft- and hardware systems capable of content-aware image processing that can automatically extract metadata of high semantic value and use them as the starting point for subsequent action, interaction or interpretation. This need is clearly recognised by the researchers working on the development of semantic-based and context-aware systems for the management of knowledge and content. Realising these aims means working towards bridging the semantic gap for visual information, and this Working Group intends to contribute to this ambitious scientific goal.

As vision problems are complex and multifaceted, it is unlikely that the semantic gap will be bridged by a unique grand unifying principle. Rather, breakthrough progress is to be expected from the symbiotic and dynamic confluence of a large number of methodologies, each contributing partial, but complementary and mutually corroborating evidence to support a final (task-dependent) interpretation. Therefore, by its very nature, image and video understanding calls for a sustained multidisciplinary research effort at a global level.

It is therefore the aim of this Working Group to act as a virtual lab in which researchers can meet to outline an ambitious vision for the future and its corresponding roadmap, and rally and organize support on a pan-European scale. This will be achieved by fostering closer collaboration among the many European groups that are active in this area, by stimulating the exchange of results and ideas, by maximizing the dissemination of information, by pooling complementary expertise through joint research initiatives and by creating focussed pan-European task forces (either virtually or physically, i.e. mobility of researchers).

Research Themes
The working group intends to organise its activities around three subthemes which by necessity share a lot of common ground. Below we give for each subtheme a non-exhaustive subject list:
- Indexing and retrieval: content-based image and video retrieval, (semi)-automatic generation of semantic metadata, cross-modality data mining (eg, combining images and text)
- Information integration: Fusion of different image modalities, content-aware image enhancement
- Visual decision and control: Visual inspection and expert systems, visual decision and control systems (eg, auto-pilots for cars), intelligent surveillance.

Methodologies
Progress in the above applications will call for methodological advances in research areas such as:
- generic probabilistic models for spatial structure detection and reasoning
- generic mathematical models for spatial processing (eg, morphology, PDEs, wavelets)
- computational intelligence (eg, simulation, Bayesian nets, evolutionary computing).

Members
Currently, researchers from 10 ERCIM member institutes participate in the Working Group: AARIT, CNR, CWI, CRCIM, FORTH, INRIA, SICS, SZTAKI, Trinity College Dublin and VTT.

http://www.cwi.nl/ERCIM/WG/Image_Understanding/

Working Group on Soft Computing

Officially established in 2002, the Soft Computing Working Group is investigating a research area that has emerged as an attempt to formulate a new paradigm of computing. Soft Computing can be considered as an association of computing methodologies focussing on fuzzy logic , neuro-computing, genetic computing , and probabilistic computing. The methodologies comprising soft computing are for the most part complementary and synergistic rather than competitive.

The guiding principle of soft computing is to exploit the tolerance for imprecision, uncertainty, partial truth, and approximation to achieve tractability, robustness, low solution cost and better rapport with reality. One of the principal aims of soft computing is to provide a foundation for the conception, design and application of intelligent systems employing its member methodologies symbiotically rather than in isolation.

For the working group, the understand the domain of SC rather broad and open — from strictly theoretical foundations to practical applications. The research topics that define the working structure are:

Mathematical and logical foundations of Soft Computing
- systematic development of the theoretical basis of non--standard (i.e., approximate, nondeterministic or uncertain, etc.) reasoning, with a special focus to approaches to fuzzy logic probabilistic and possibilistic logic, Dempster-Shafer theory and related approaches;
- Research in fuzzy logic programming in predicate calculus and with wider class of connectives (conjunctors and aggregation operators) which appear in practical application where one works with approximation of connectives;
- design of the respective calculi for uncertainty, imprecision and vagueness quantification and processing, studying and proving of their theoretical properties both from logic and algorithmic points of view; mutual confrontation of these calculi from the viewpoint of their expressive and processing power;
- development of the theory of complexity of feed forward and recurrent neural networks and their learning algorithms based on complexity measure corresponding to various implementation possibilities.

Algorithmic foundations of Soft Computing
- design and investigation of models suitable for realisation of formal calculi studied/proposed in the previous item;
- design, development and analysis of formal, abstract machine models embodying the ideas of soft computing, inspired by biological or genetic models, with special regard to massively parallel models, distributed models, and neuromorphic models;
- extending the theoretical basis of neural network--based computation with a special regard to approximation theory and related development of new neural computation paradigms;
- the design and analysis of efficient algorithms for the fundmental problems in soft computing, both for internal need of the theory, as well as for various application areas, especially in the field of data mining.

Experimental applications of Soft Computing

- identifying new soft computing information processing application areas particularly in the field of fuzzy and neuro--fuzzy systems, hybrid (i.e., analog and neural) systems, data/knowledge bases, data warehouses, data mining, etc.
- identification and formalisation (modelling) of paradigmatical problems of Soft Computing;
- the analysis, design, and development of formal methods and algorithms for the inconsistency, conflict resolution in the process of data/knowledge bases and warehouses, integration, including the problems of different kinds of the fuzziness (vagueness, degree of truth) and of the uncertainty (probabilistic, possibilistic, degree of belief);
- experimental implementations of new systems of Soft Computing.

In all those domains the aim of creative synthesis of various approaches to Soft Computing is stressed.

Members

The working group currently gathers scientists from the ERCIM institutes CRCIM and SRCIM, non ERCIM members are from Austira, Belgium, Germany, Hungary, Italy and Poland.

http://www.cs.cas.cz/ercim/

Projects

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. 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 twenty 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 2002

ANFAS – Data Fusion for Flood Analysis and Decision Support
The ANFAS project is developing a decision support system for flood prevention and protection, integrating the most advanced techniques in data processing and management.
Budget: 3 800 000 Euro
Supported by: European Commission, IST Programme, Chinese Ministry of Research
Duration: January 2000 - December 2002

CYCLADES - An Open Collaborative Virtual Archive Service Environment
CYCLADES will develop 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 Commssion, IST Programme
Duration: February 2001 - July 2003

DECAIR – Development of an Earth Observation Data Converter with Application to Air Quality Forecast
The DECAIR project provides air pollution models with good quality input data derived from earth observation satellites data, and to design a system prototype able to provide models with their required data under specific quality constraints.
Budget: 1 880 000 Euro
Supported by: European Commission, Centre for Earth Observation Programme
Duration: June 1999 - May 2002

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: 950 000 Euro
Supported by: European Commssion, IST Programme
Duration: January 2000 - December 2002

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 Commssion, IST Programme
Duration: January 2000 - December 2002

SCHOLNET - A Digital Library Testbed to Support Networked Scholarly Communities
Scholnet provides an enhanced digital library infrastructure for immediate dissemination of and accessibility to the technical documentation produced by various globally distributed, multilingual communities.
Budget: 1 898 640 Euro
Supported by: European Commssion, IST Programme
Duration: November 2000 - April 2002

RESET - Roadmap on European Research for Smartcard Technologies - A Thematic Network
RESET will investigates 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.
Supported by: European Commssion, IST Programme
Duration: September 2002 – May 2003

TELEMAC - Telemonitoring and Advanced Telecontrol of High Yield Wastewater Treatment Plants
TELEMAC is designing 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 Commssion, IST Programme
Duration: September 2001 – August 2004

WADI - Water Supply Watershed Planning and Management: an Integrated Approach
The WADI project is to developing a decision support system for rational planning, operation and management of specific watersheds that are characterized by water scarcity and lack of groundwater, with the aim of improving the water supply and consequently helping to satisfy water demand.
Budget: 1 489 042 Euro
Supported by: European Commssion, INCO-MED Programme
Duration: April 2001 – March 2004

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

RESET — A Roadmap for European Research in Smartcard Technologies

RESET is the first ever made attempt of the smart card industry to assess, in a global way, its technology priorities and R&D orientations. Experts in six technology domains have organised workshops from October to December 2002.

RESET is a Thematic Network to build a roadmap investigating future research challenges and opportunities in the field of smart cards. It includes representatives from European smart-card industry and the research community. RESET is jointly managed by ERCIM and Eurosmart, supported by the IST Programme of the European Commission.

Smart cards are key components addressing security needs in a number of well established consumer applications. Although the smart card industry is currently experiencing a decreased development rate - mainly resulting from the global slow down of ICT markets and in particular mobile phone markets - experts are convinced that there is still an enormous potential for smart card deployment in traditional, and new application areas.

Traditional high-volume applications include banking, telecom, pay-TV, etc. There is still a strong need for innovation to address the requirements of those applications to overcome existing limitations and anticipated evolving environments. But an even higher potential for smart card technology applications is expected from upcoming ubiquitous computing and ambient intelligence environments. These environments create a need for 'handy' personal keys that can provide the required level of trust and confidence to users in networked applications. Current smart card technology has an advance over other solutions to address these needs - however some key aspects such as improvement of online security management and speed of communication protocols must be seriously considered to enable the integration of a trusted personal device such as a smart card in networked applications.

Domains of Investigation In order to establish a suitable roadmap, the project had to take into account a specificity of smart card systems, which is to integrate a wide range of technologies. The investigation carried out has therefore been divided in six main technology areas, each of them covered by one expert working group:
- communication and networking
- systems and software
- interface technologies
- peripherals, subsystems and microsystems
- high-end cryptography, tamper-resistant and security technologies
- micro-electronics.

The investigation of the working groups was carried out following a common framework which included the following topics:
- state of the art: existing and emerging technologies, their limitations, competing technologies
- on-going research: inside and outside the smart card world
- evaluation of technology and marketing requirements
- research orientations for improvement: short, medium and long term.

The results of this investigation and consultation process will be published in a report. A draft has been presented and discussed during an public seminar in Brussels on 3 April. The report starts with a short description of the socio-economic context that influences the development and deployment of new generation smart card applications. Then a summary of the main outcomes of the 6 working groups is introduced. The report also includes a summary of the main driving and blocking factors that condition the evolution of smart cards and then identifies the technical challenges that need to be mastered to enable the European smart card technology suppliers to deal with these factors, address anticipated requirements and exploit new market opportunities. Further, it lists the resulting main R&D targets and RTD programmes and resources that have a capacity to carry out smart card technology related research. Recommendations are proposed for integrated collaborative research programme that would federate the required level of European R&D resources to address these R&D targets.

The final report will be available on the project website.

http://www.ercim.org/reset

Fellowship Programme

The PhD Fellowship Programme has been established as one of the premier activities of ERCIM. Since its inception in 1991, over 120 fellows have passed through the programme. Nineteen young scientists commenced an ERCIM PhD Fellowship in 2002, and 35 fellows have been employed during the year, representing 184.5 man-months.

The ERCIM Fellowship Programme is open to young researchers from all over the world. It focuses mainly on topics of interest identified by the ERCIM Working Groups. 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/

Fellow	Nationality	Visited Institute(s)	
Frederic Goulard	French	CWI SARIT	01/09/00-31/05/01 01/06/01-28/02/02
Enrico Capobianco	Italian	CWI	01/04/01-30/09/02
Yingwen Song	Chinese	INRIA	01/05/01-31/01/02
Daniel Smutek	Czech	TCD VTT	01/05/01-31/01/02 01/02/02-31/10/02
Michalis Vazirgiannis	Greek	INRIA	01/06/01-28/02/02
Hong Shu	Chinese	FhG SARIT	01/07/01-31/03/02 01/04/01-31/12/02
Ruvan Weerasinghe	Sri Lankan	INRIA	12/07/01-11/04/02
Christoph Sprenger	Swiss	INRIA	01/10/02-30/06/03
Andreas Rauber	Austrian	CNR INRIA	01/09/01-31/05/02 01/06/02-28/02/03
Dharmendra Singh	Indian	INRIA	01/09/01-31/05/02
Gakuhito Hirasawa	Japanese	INRIA	05/09/01-04/06/02
Emmanouil Theodorakis	Greek	FhG	01/09/01-31/05/02
Cormac Walsh	Irish	INRIA	01/09/01-31/05/02
Amalia Todirascu	Romanian	INRIA	01/09/01-31/05/02
Yann Loyer	French	CNR	01/09/01-31/05/02
Nadia Pisanti	Italian	INRIA	15/09/01-14/06/02
Conrado Daws	Uruguayan	CWI	01/12/01-01/09/02
Idrees Ahmad	Pakistani	INRIA	12/03/02-12/12/02
Rafael Ramirez-Melendez	Mexican	INRIA	11/07/02–31/08/02
Christian Mönch	German	NTNU SZTAKI	01/03/02-30/11/02 06/0103-05/10/03
Maurice Ter Beek	Dutch	SZTAKI CNR	11/03/02-11/12/02 01/01/03-30/09/03
Bixin Li	Chinese	NTNU CWI	01/04/02-31/12/02 01/04/03-31/12/03
Marios Fyrillas	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 25/08/03-24/09/04
Richard Moot	German	INRIA	01/10/02-30/06/03
Luciane Quoos Conte	Brasilian	NTNU	07/10/02-06/07/03
Luis Martins	Portuguese	FhG INRIA	15/10/02-14/07/03 -15/10/03-14/07/04
Monica Vladoiu	Romanian	NTNU	07/11/02-06/08/03
Mohamed El Ansari	Moroccan	NTNU	11/12/02-26/08/03
Serguei Roubstov	Russian	VTT	01/12/02-31/08/03
Rosella Gennari	Italian	CWI	09/12/02-30/03/03

Fellows hosted by ERCIM institutes during 2002.

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
3	3	6	12	9	10	12	9	8	7	8	19	19
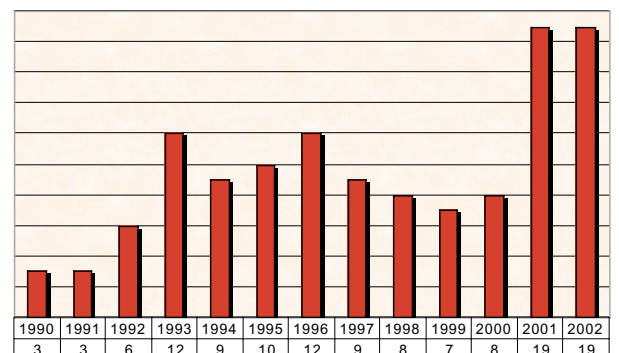
Number of fellows per annum starting an ERCIM grant.

Cor Baayen Award

Andreas Rauber Winner of the 2002 Cor Baayen Award

The annual ERCIM Cor Baayen Award was presented to Andreas Rauber during a ceremony in Nice on 7 November 2002. The award, named in honour of the first ERCIM President Cor Baayen, is given every year to a most promising young researcher in computer science and applied mathematics having completed the PhD-thesis in one of the 'ERCIM countries'.

Andreas Rauber is a bright, young researcher at the Department of Software Technology, Vienna University of Technology. Andreas Rauber received his PhD in 2001 from Vienna University of Technology. He started his research career in the area of neural networks where he worked on improvements of the self-organizing map architecture. One of his assets, however, is his wide spread interest which made him progress into and integrate different fields of research. His current focus is on digital libraries where he investigates novel paths for semantically classifying information from heterogeneous sources, as for example text and music. His scientific curiosity paired with his sense for technical rigour is responsible for his high-quality research achievements.

Besides his core research and his more than 60 peer-reviewed publications, Andreas Rauber is also an active member of the international scientific community exemplified by his membership in various program commitees at international conferences and on the board of the IEEE Technical Commitee on Digital Libraries. See also his article on page 45: 'SOMLib – New Approaches for Information Presentation and Handling'. Andreas Rauber is currently an ERCIM Research Fellow at INRIA.

Cor Baayen Award
Rules for Nomination

Nominations for each country are made by the corresponding ERCIM Executive Committee member (also referred to as the 'national contact'). Those who wish a particular candidate to be nominated should therefore contact the ERCIM Executive Committee member for their country (see http://www.ercim.org/contacts/execom/execom.html).

Nominees must have carried out their work in one of the 'ERCIM countries' and they must have been awarded their PhD (or equivalent) no more than two years prior to the date of nomination.

Each ERCIM institute is allowed to nominate up to two persons from its country. A person can only be nominated once for the Cor Baayen Award. The selection of the Cor Baayen award is the responsibility of the ERCIM Executive Committee.

How to Nominate

For proposing a nomination to your national contact, fill out the Cor Baayen Award Nomination Form available at the ERCIM website.

Further information can be obtained from your national contact or from the ERCIM Cor Baayen Award coordinator Lubos Brim.

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

Andreas Rauber at the award ceremony.

Event Sponsorship Programme

Conference and Workshop/ Summer School Sponsorship

ERCIM sponsors up to ten conferences and workshops or summer schoolsper 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 2002

19th STACS, 19th International Symposium on Theoretical Aspects of Computer Science,
Antibes Juan-les-Pins, France, March 14-16 2002

Eurocrypt 2002, Amsterdam
April 28-May 2, 2002

CEOI2002 - Central European Olympiad in Informatics 2002
Kosice, Slovakia, 30 June-6 July 2002

ISSTA - International Symposium on Software Testing and Analysis
Rome, 22-24 July 2002

14th International Conference on Software Engineering and Knowledge Engineering
Ischia, Italy, July 15-19, 2002

CONCUR 2002, Brno, Czech Republic
20-23 August 2002

EDBT'02 Summer School, Distributed Databases on the Net: Models, Languages and Infrastructures,
Cargèse, Corsica, France, 26-31 August 2002

IEEE Joint International Requirements Engineering Conference (RE'02), Essen,
Germany, 13-20 September 2002

HCI02 - Human-computer interaction for mobile devices
Pisa, Italy, 18-20 September 2002

DIALM 2002 - Sixth International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications
Atlanta, Georgia, USA, September, 28, 2002

SOFSEM 2002 - 29th Annual Conference on Current Trends in Theory and Practice of Informatics
Milovy, Czech Republic, November 24-29, 2002

Euroweb 2002 Conference
Oxford, UK, 17-18 December 2002

Publications

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

In 2002, ERCIM celebrated the fiftieth issue of its magazine ERCIM News. The magazine 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. Published quarterly, ERCIM News carries reports on joint actions of ERCIM partners, and aims to reflect the contribution made by ERCIM to the European Community in Information Technology. 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 2002 are Information Security, ERCIMathematics, Semantic Web and Embedded Systems. For each issue, ERCIM News invites a personality to write a keynote statement relevant to the European scientific community. Invited authors have included Philippe Busquin, European Commissioner for Research; Rolf Jeltsch, President of the European Mathematical Society and Tim Berners-Lee, Director of W3C.

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 a circulation of over 8500 copies and is distributed in over ninety 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.
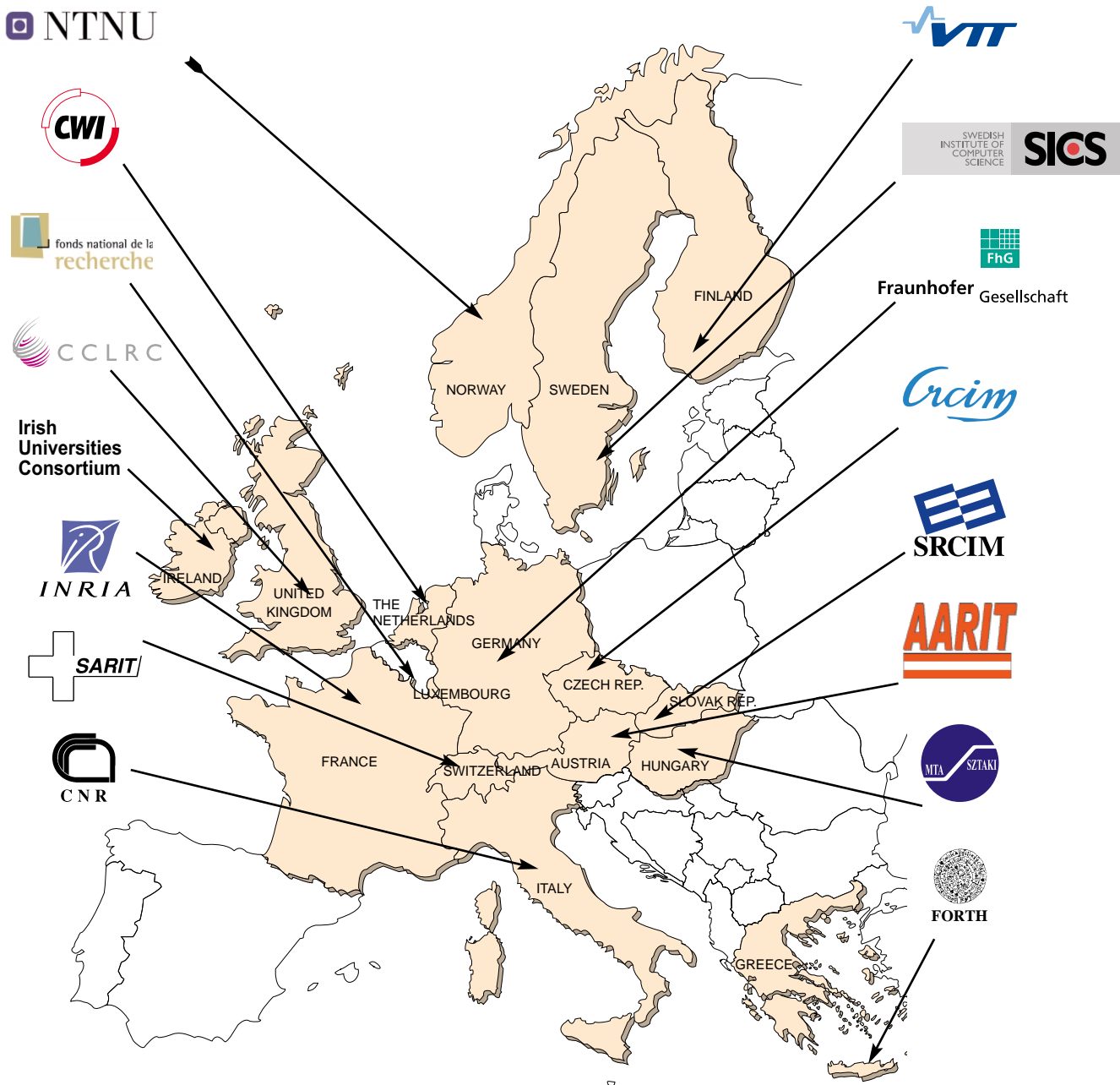
http://www.ercim.org/publication/Ercim_News/

ERCIM has also published the workshop proceedings of the DELOS Network of Excellence on Digital Libraries and the reports on the EU-NSF strategic workshops.

http://www.ercim.org/publication/workshop_reports.html
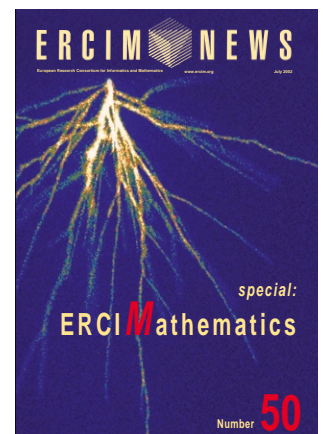
Members

The membership and geographical reach of ERCIM has gradually grown to its current sixteen member institutes. These are: AARIT in Austria, CCLRC in the UK, CNR in Italy, CWI in the Netherlands, FNR in Luxembourg, ICS-FORTH in Greece, Fraunhofer-Gesellschaft in Germany, INRIA in France, NTNU in Norway, SARIT in Switzerland, SICS in Sweden, 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.

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The mission of AARIT is to pomote 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:

- 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 - Österreichische Computer Gesellschaft) OCG 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.

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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:

- Central Laser Facility - including "Vulcan" and "ASTRA"
- Central Microstructure Facility - including nano-engineering
- "ISIS" - Spallation Neutron Source
- Synchrotron Radiation Source
- New Synchrotron Light Source - "Diamond" (CCLRC major owner)
- Focus / Hub for the UK e-Science Initiative.

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:

- 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
- Digital Media,Visualisation Facility and a Virtual Reality Centre.
- Mail server/List servers (NAMLS)
- HPCx capability of 11 Teraflops processing

■ 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 (2002-2003): 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, 2002-2003).

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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 Tecnologie 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.
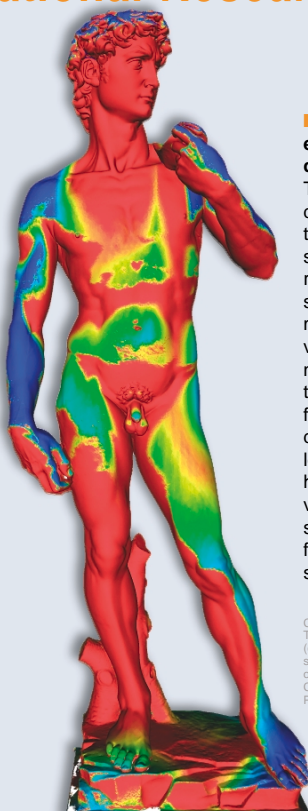
■ Istituto di Scienza e Tecnologie dell'Informazione

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 MEuro, excluding costs of the permanent staff:
- 33% EC projects
- 25% national research projects
- 15% CNR
- 15% public and local administration
- 12% industry

■ Staff

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

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.
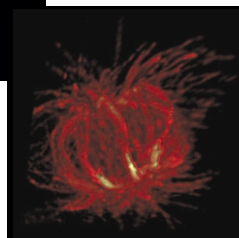
■ Research

CWI's research is organized in clusters of related themes:
- Probability, Networks and Algorithms
- Software Engineering
- Modelling, Analysis and Simulation
- Information Systems.
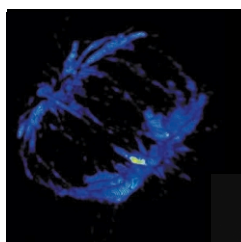
Visualization of cell division (mitosis). The coloured part represents chromosomes being drawn apart..

■ Recent Applications

Railroad timetables; Integrated services in telecom networks; Traffic control of motorway networks; Multi-resolution methods in image processing; Image processing across the Web; Software renovation; Testing of embedded software with formal methods; Evolutionary methods for E-commerce and management; Mathematical models of living cells; Optimal shape of ship hulls; Factoring methods and data security; Interactive visualisation; Querying large distributed multimedia databases; Multimedia presentations on the Web (SMIL).

■ Co-operation and Knowledge Transfer

CWI maintains a broad spectrum of contacts with companies and institutions through joint participation in projects. Besides, there are direct commissions from industry and the government. CWI participates in some 30 European projects, and is a partner in over 70 national projects. CWI pursues an active policy of creating spin-off companies, and has created to this end CWI Incubator Ltd.

■ Budget

Total annual budget: 13 million Euro
- 70% basic national funding
- 30% participation in (inter)national research programmes and from contracts with industry.

■ Staff (in full time equivalents)

- 160 Researchers
- 50 Supporting staff.

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

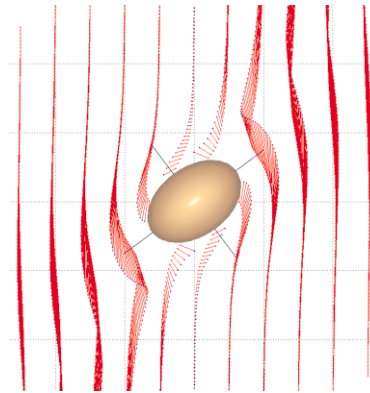Institute of Information Theory and Automation, Academy of Sciences, Prague

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 throuhg 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).

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-anual 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

- Institut Supérieur de Technologie
http://www.ist.lu

- Centre Universitaire de Luxembourg
http://www.cu.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 EUR

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

Foundation for Research and Technology – Hellas Institute of Computer Science

Since its establishment in 1983, the Institute of Computer Science (ICS-FORTH) has a relatively long history and an established tradition of internationally acknowledged excellence in conducting basic and applied research, developing applications and products, and providing services. The research directions take into consideration the state of the art, international trends, research and technological challenges worldwide, as well as the needs of the public and private sectors in Greece. ICS-FORTH is a pioneering contributor towards the deployment and adoption of Information Society Technologies in Greece and plays a leading role in worldwide efforts towards the development of an Information Society accessible and acceptable by all citizens.

Cultural Information Systems

■ Research & Development Activities

On-going research and development efforts focus on: information systems; data and knowledge-based systems; information retrieval, including content-based approaches; image processing and pattern recognition; computer vision; sensor technologies; robotics; machine learning; digital communications; network management; computer architectures; VLSI design; computer aided design; human-computer interaction; virtual reality; universal access and usability; information and communication technologies in Healthcare; and assistive technologies for people with disabilities. Based on existing research experience and available know-how, efforts in the near future will also include basic and applied research in bio-informatics, Web systems and technologies, embedded systems, and GRID and large-scale computing.

The institute is organised into the following units:
- Information Systems Laboratory
- Computer Architecture and VLSI Systems Laboratory
- Telecommunications and Networks Laboratory
- Distributed Systems Laboratory
- Center for Medical Informatics and Health Telematics Applications
- Computational Vision and Robotics Laboratory
- Human-Computer Interaction Laboratory
- Center for Universal Access and Assistive Technologies
- FORTHnet R&D
- Department of Internet Domain Names Administration for [.gr]
- Department of Education and Training
- Department of Systems and Networks Administration.

HYGEIAnet: The Regional Health Telematics Network of Crete

■ Budget

Annual Budget (2001): 7,3 Million .

■ Staff

ICS-FORTH employs a total of 245 people: 9 researchers, 16 university faculty, 101 technical personnel, 10 administrative and auxiliary personnel, 60 graduate research assistants, and 49 trainees.

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 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.

"Living and Working in a Networked World" is the title of a joint program the group has developed for application-oriented basic and preliminary research, funded by the Federal Ministry of Education and Research. Within seven research programs, the following core issues of IT and communication technology for the future are being investigated: New Generation Internet, Multimodal Dialogs and New Media, Knowledge and Content Engineering, IT-Security, Computing and Biology, Simulation and Virtual Engineering plus Innovative Applications and ICT-based Services.

■ Budget

Annual budget: approx. 180 million ¤

■ Staff

Approx. 2000 scientific and administrative staff.

Locations of the institutes in Germany.

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.

■ Research

INRIA focuses its research on four major research themes:
- Network and Systems: parallel computing and architectures; performance evaluation; distributed and real-time programming
- Software engineering and symbolic computation: semantics and programming; algorithms and computer algebra
- Human-computer interaction, images, data, knowledge: data and knowledge management, cognitive systems; vision, image analysis and generation
- Simulation and optimization of complex systems: automatic control, robotics, signal processing; modelling and scientific computing.

■ 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 300 contracts)
- development initiatives
- the setting up of high-tech companies (some 50 companies since 1984).

■ Budget

Total annual budget: 100 Million
- 75% basic national funding
- 25% own resources.

■ Staff

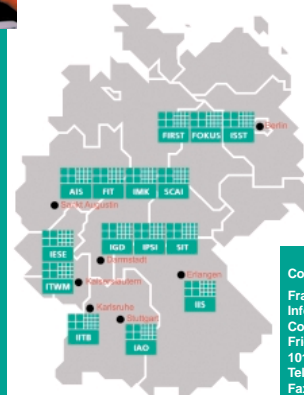- 1700 scientific staff including some 550 PhD students
- 400 supporting and administrative staff.

European Research Consortium for Informatics and Mathematics

ERCIM
www.ercim.org

W3C® MEMBER

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

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.

European Research Consortium for Informatics and Mathematics

ERCIM
www.ercim.org

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.
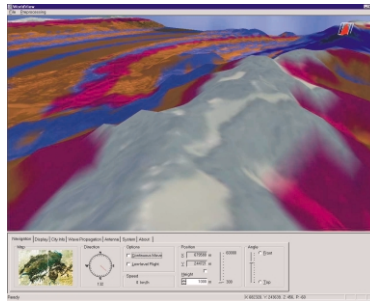
Automatic Antenna placement with WorldView.

SARIT organizes two series of conferences:

• the Swiss Computer Science Conference (SCSC), the next to be held on "Multimodal technologies for human-computer interaction" in early 2004
• the CHIP (Swiss Informatics Professor) Conference

the latest having been held in Biel on January 24, 2003.

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 (ETHZ) in Zurich and at the Swiss Federal Institute of Technology (EPFL) in Lausanne.

Contact:
SARIT Office
c/o Prof. Dr Alfred Strohmeier
EPFL-IC-LGL
CH-1015 Lausanne

Tel +41 21 693 4231
Fax +41 21 693 5079
http://www.sarit.ch/

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 scaleable 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 ¤.

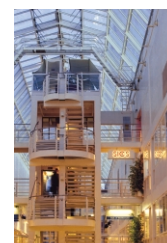## ■ Staff

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

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 Republik.

■ 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 Pavillon 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.

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

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

MTA SZTAKI

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.
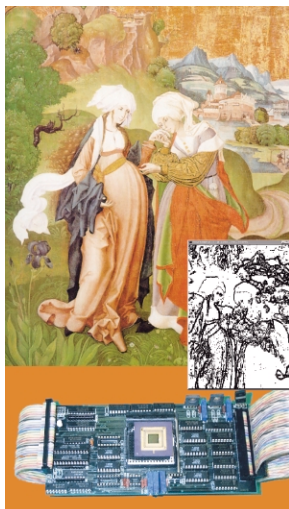
■ Mission

SZTAKI's mission is to carry out basic and application-oriented research in an inter-disciplinary setting in the field of computer science, intelligent systems, process control, wide-area networking and multimedia. The activities cover the C^3I – 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.

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

■ 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 led by the MIT, 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: 10,1 million

• Basic national funding: 30%

• Participation in (inter)national research programmes and from contracts with industry: 70%.

■ 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/

Irish Universities Consortium
Focus: Trinity College Dublin

The Irish Universities Consortium (Trinity College Dublin; Dublin City University; University College Dublin; National University of Ireland, Maynooth; National University of Ireland, Galway; National University of Ireland, Cork; University of Limerick) represented through Departments of Computing and Computer Science is ERCIM's gateway to the Irish Information Technology research community.

Trinity College Dublin: front square and the Campanile.

Trinity College Dublin

■ Research

The Department is deeply committed to research with groups spanning virtually all areas of computing from formal methods to applied information systems and computer architecture. Members of the Department publish widely in International Journals and Conference Proceedings and have received many awards for their research. The Department also publishes a Technical Report series, which is available on the Web.

■ Co-operation and Knowledge Transfer

The Department has a long record of participation in EU funded research programmes and has developed close links with industry, both nationally and internationally. The Department is strongly committed to technology transfer and commercial exploitation of its research. Over its 31 year history, the Department has spun-off a number of companies of which the most well-known is Iona Technologies. Other spin-offs include Ireland's first Internet Service Provider, IEUnet, now EsatNet, X-Communications in multimedia technology, MVT in machine vision, and most recently Havok.com which develops software tools for the computer games industry.

■ Budget
Research income:
2 million Euro, of which approximately 60% comes from EU framework programmes.

■ Staff
- 50 academic staff
- 100 researchers/ postgraduate
- 18 technical and supporting staff.

Contact:
**Trinity College
Department of
Computer Science
Dublin 2
Ireland**

Tel: +353 1 608 1765
Fax: +353 1 677 2204
http://www.cs.tcd.ie/

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, datamining, language engineering, product information management, transport management.

■ Recent applications
- An operative management system for wood procurement - the systems calculates a unique transport programme for each wood batch, including routing and unloading site schedules.
- Software delivery involving algoritms for processing raw data from the Envisat satellite into high-level information products.
- Radio frequency identification system. A UHF and microwave RFID system based on CMOS technology that allows RFID data to be read from as far away as four metres.
- Production process for bonded silicon-on-insulator (SOI) wafers. With this technique a high quality single crystalline semiconductor layer can be fabricated to top of an insulating layer.

- The NewsScan˙ system monitors textual and audio expressions that appear in media. NewsScan˙ uses speech recognition and is therefore able to find topics also in radio and television news. It also analyses closed captions in television broadcasts.
- A mobile web service for city travellers. It gives access to the web independent of time and place, location aware services and rich multimedia web contents.
- Remote sensing methods for monitoring carbon emissions can be used to monitorcompliance with obligations under the Kyoto Protocol.
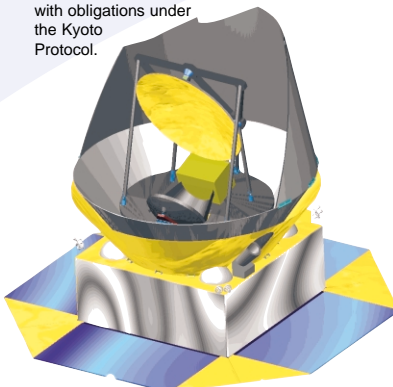
Ultra low noise 70 GHz receiver.

■ 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 MEuro

Turnover VTT Information Technology 38 MEuro
- Budget funding 34%
- Income from the private sector 30%
- Income from the public sectoe 26%
- Income from abroad 10%.

Virtual Reality application at VTT.

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

	AARIT	CLRC	CNR	CRCIM	CWI	FORTH	FNR	FhG	INRIA	NTNU	SARIT	SICS	SRCIM	SZTAKI	TCD	VTT
algebra, analysis and geometry																
algebra and geometry			●	●	●			●	●		●		●	●		
computer algebra				●				●	●		●			●		
non-linear analysis					●											
combinatorics (2000 MSC 05)																
combinatorics			●	●	●	●		●	●		●	●	●	●		●
graph theory		●	●	●	●	●	●	●	●		●		●	●		
number theory (2000 MSC 11)																
number theory and security			●	●	●	●	●	●	●		●	●	●	●		
differential equations (2000 MSC 33-35)																
applied analysis of partial differential equations					●											
non-linear systems in physics, life sciences and the environment			●	●	●			●	●		●	●	●	●		
special functions					●											
control and system theory (2000 MSC 49/93)																
control and system theory	●	●	●	●	●	●	●	●	●	●	●	●	●		●	
stochastics (2000 MSC 62/65)																
classification		●	●	●		●		●	●				●	●	●	
probability and statistics	●		●	●	●	●	●	●	●				●	●		●
statistical informatics		●	●	●		●	●	●	●							●
stochastic analysis and finance				●	●			●	●		●		●	●		
stochastic geometry				●	●			●						●		
numerical mathematics and differential equations (2000 MSC 65, 33-35)																
non-linear systems in physics, life sciences and the environment			●	●	●		●	●	●		●		●	●		
parellel software for implicit differential equations				●				●					●	●		
hardware (2000 ACM B)																
evolvable hardware	●					●	●				●					●
microwave and radio frequency circuits	●							●			●		●			●
silicon systems	●					●	●	●	●		●		●	●		●
storage architectures			●			●		●			●				●	
video	●	●						●	●		●				●	●
software (2000 ACM D)																
adaptive programs and systems			●	●	●		●	●	●	●		●		●	●	●
compilers		●		●	●		●	●	●		●	●		●		●
component based programming	●	●	●	●	●	●		●	●	●	●			●		●
constraint programming	●	●		●	●		●	●	●	●	●	●	●	●		
coordination languages			●		●		●	●								
distributed and parallel systems	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
domain specific languages	●				●			●	●				●			●
embedded systems	●		●		●	●	●	●	●	●						
interactive software and systems	●	●	●		●	●		●	●		●	●	●	●	●	●
operating systems		●	●	●		●		●	●			●	●	●	●	
real time and high performance programming	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
standards	●	●	●		●	●	●	●	●		●			●		
software optimisation					●	●	●	●	●							●

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	AARIT	CLRC	CNR	CRCIM	CWI	FORTH	FNR	FhG	INRIA	NTNU	SARIT	SICS	SRCIM	SZTAKI	TCD	VTT
software renovation			●		●			●	●				●	●		
software specification, analysis and testing	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
structured documentation		●	●				●	●	●				●			●
trace analysis							●	●							●	
theory of computation (2000 ACM F)																
computer arithmetic			●					●	●		●					
concurrency	●	●	●	●	●	●	●		●						●	
correctness proofs and verification	●	●	●	●	●		●	●	●		●	●	●	●	●	
cryptography, complexity and security	●	●	●	●	●	●	●	●	●		●	●	●			●
DNA computing			●			●		●	●		●			●		
formal methods		●	●		●		●	●	●			●		●		
fuzzy logics		●	●	●				●			●		●	●		●
neurocomputing	●	●	●	●				●	●		●		●			●
quantum computing	●	●	●	●	●			●					●	●		
information systems (2000 ACM H)																
coding, indexing and retrieval	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
data mining	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
design and analysis of dependable systems	●	●	●					●	●	●					●	
(cultural) information systems	●	●	●			●		●							●	
geographical information systems	●	●	●			●		●	●		●					●
knowledge management	●	●	●		●	●		●	●		●	●	●		●	●
man machine interaction	●	●	●		●	●	●	●	●	●		●		●		●
multimedia databases	●	●	●	●	●	●		●	●	●	●			●	●	●
telematics in transportation and logistics	●				●			●		●						
computing methodologies (2000 ACM I)																
autonomous systems	●	●				●		●		●	●	●			●	●
dual dynamics								●								
evolutionary algorithms			●	●	●	●	●	●	●	●			●	●	●	●
facial and physically based computer animation			●		●			●	●		●				●	
hypertext and hypermedia	●	●	●		●	●	●	●	●				●	●		
image analysis	●		●	●	●	●		●	●	●	●		●	●		●
information visualisation	●	●	●		●	●	●		●		●	●				●
language engineering	●	●	●	●			●	●	●		●	●			●	●
machine learning	●		●	●	●	●	●	●	●		●	●	●	●	●	●
metacomputing		●	●			●	●	●	●					●	●	
requirements engineering		●	●			●	●	●								●
reverse engineering			●					●					●	●		
robotics and intelligent vehicles	●	●	●			●		●	●	●	●	●	●	●		
speech	●		●	●		●	●	●	●	●	●		●		●	
visualisation and virtual reality	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●

	AARIT	CLRC	CNR	CRCIM	CWI	FORTH	FNR	FhG	INRIA	NTNU	SARIT	SICS	SRCIM	SZTAKI	TCD	VTT
computer applications (2000 ACM J)																
bio-informatics	X	X	X		X	X	X	X	X	X	X	X		X	X	X
business process modelling	X	X		X	X	X	X	X	X	X	X			X		X
computerised help to handicapped	X	X	X		X	X		X				X	X		X	X
computer music and cognitive musicology	X	X	X					X					X			
decision support systems	X	X	X	X		X	X	X			X	X	X	X	X	X
medical informatics	X	X	X	X		X	X	X	X	X	X			X	X	X
production informatics	X						X	X	X			X		X		X
aerospace engineering	X	X	X					X	X							X
fluid dynamics (2000 MSC 76)																
fluid dynamics		X	X	X	X			X	X		X			X		
electromagnetism (2000 MSC 78)																
applied electromagnetism		X	X		X			X	X		X		X			X
operations research (2000 MSC 90)																
optimisation		X	X		X		X	X								
information and communication technology																
applied information technology	X	X	X	X		X	X	X	X	X	X	X	X	X		X
communication networks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
digital, VLSI and microelectronics technologies	X	X				X	X	X	X	X	X					X
(advanced) ICT applications and technology																
digital libraries	X	X	X	X	X	X		X		X		X		X		
computer supported co-operative working		X	X		X	X	X	X	X	X		X		X	X	X
e-commerce	X	X	X		X	X	X	X		X	X	X			X	X
e-learning	X	X	X	X		X	X	X		X					X	X
GRIDs	X	X	X			X	X	X	X	X	X			X	X	X
networks																
IP protocols, routing and real time services	X	X	X		X	X	X	X	X	X	X	X	X			X
mobile and wireless computing	X	X	X			X	X	X	X	X	X	X			X	X
network architecture and management		X	X		X	X	X	X	X	X	X	X	X	X	X	X
radio technology	X	X					X	X		X	X		X	X		X
World Wide Web																
cummunity Web portals		X	X		X	X	X	X			X			X	X	X
DataWeb	X	X	X	X	X	X		X			X			X		
WWW applications	X	X	X	X	X	X	X	X	X	X	X	X		X		X
WWW future		X	X		X	X		X	X	X				X		X