# INFORMATION SOCIETY TECHNOLOGIES

# (IST)

# PROGRAMME



**Contract for:**

**Shared-cost RTD**

## *Appendix A - "Consortium Description"*

Project acronym: **COLDEX**

Project full title: **Collaborative Learning and Distributed Experimentation**

Proposal/Contract no.: **IST-2001-32327**

Version no.:1

Related to other Contract no.: *(to be completed by Commission)*

Date of preparation of Annex 1: 15/04/2002

Operative commencement date of contract: *(to be completed by Commission)*

## 1. Content list

Part                                                                                    Page

# 1. Consortium Description

| Partner | Methodology and theory | Scenarios (developer/user) | Target group |
|---|---|---|---|
| UDUI (1) | *CSCL design and analysis;*<br><br>*Theories of collab. Learning and Activity Theory;*<br><br>*Synchronous shared workspace systems (collab. visual languages);*<br><br>*Ubiquitous computing in learning environments;*<br><br>*Visualisation & modelling* | *local scenarios, esp. models of human perception (co-developer & user);*<br><br>*remotes scenarios (user)* | *undergraduate academics (comp. science, comm. and media);*<br><br>*secondary high school (physics)* |
| UCH (2) | *Telecommunication technology;*<br><br>*Distributed classroom technology;*<br><br>*Educational design (esp. interfaces for blind learners)* | *remote scenarios (developer & user),*<br><br>*local scenarios*<br><br>*(co-developer & user)* | *undergraduate academics (physics, mech.eng.);*<br><br>*high schools (ENLACES network)* |
| VXU (3) | *Scientific modelling – system dynamics;*<br><br>*Ethnographic studies in education;*<br><br>*Participatory educational design with teachers;* | *local scenarios, esp. environmental studies and biodiversity (co-developer);*<br><br>*remote scenarios (user)* | *secondary high schools +*<br><br>*regional teacher network* |
| USB (4) | *VRML and other 3D modelling languages;*<br><br>*web languages and tools;*<br><br>*programming languages* | *remote scenarios (co-developer);*<br><br>*local scenarios (co-developer, esp. 3D modelling tools)* | |

| | | | |
|---|---|---|---|
| UNED (5) | *Analysis of collab. Learning (asynchronous);*<br><br>*Using Activity Theory in educational design;*<br><br>*Document structuring and electronic archives;*<br><br>*Educational networking* | *local scenarios, esp. environmental aspects (co-developer & user);*<br><br>*remote scenarios (user)* | *academic distance education (chemistry), esp. open access* |
| UPM (6) | *web-based learning environments for engineering;*<br><br>*remote control of experiments;*<br><br>*visualisation & modelling* | *remote scenarios (developer & user);*<br><br>*local scenarios*<br><br>*(user)* | *undergraduate academics (mech.eng.)* |
| INESC (7) | *Animated software agents (incl. VR models);*<br><br>*Agent models of perception and interaction;*<br><br>*Intelligent support* | *local scenarios, esp. models of human perception (developer)* | |
| UAN (8) | | *remote scenarios*<br><br>*(co-developer, provider)* | *potential user (undergraduate acad.), link to schools in OUS* |

# 2. Description of the participants

## 2.1 University of Duisburg

## Partner profile

COLLIDE Research Group at the University of Duisburg, Germany

The University of Duisburg (Gerhard-Mercator-Universität) has about 15000 students in areas including humanities, science, engineering and higher teacher education. The recently created Computer Science Department has a modern profile with 12 professor positions. It has recently started two new study programmes: an interdisciplinary B.Sc./M.Sc. programme in "Applied Media and Communication Science" and a diploma programme in "Applied Computer Science". Due to it its involvement in higher teacher education in computer science (M.Sc. equivalent), there are strong links to schools and other local and regional educational institutions. E.g., the classroom environment of the ESE project NIMIS (Esprit 29301) has been co-sponsored by the City Council of Duisburg as the institution responsible for school budgets and equipment. There is also a continuous engagement of our computer science colleagues in teacher training on the regional level. These links can be easily activated in the project proposed here. There are a number of local schools interested in co-operating with the envisaged project.

The COLLIDE ("Collaborative Learning in Intelligent Distributed Environments", link: http://collide.informatik.uni-duisburg.de) research group belongs to the Institute of Informatics and Interactive Systems within the new Computer Science department. COLLIDE aims at developing distributed, intelligently supported environments for collaborative learning. It has been engaged in European projects on distributed classroom technology for both virtual and presence scenarios. Recently, COLLIDE initiated and coordinated a European project on developing innovative classroom technology for pre-school children and school beginners in the framework of a European programme on "Experimental School Environments". The specialities of NIMIS are characterised by combining a computer-integrated classroom environment ("roomware") with new interaction techniques (pen-based input, speech output) and intelligent analysis and support. Additionally, COLLIDE participates in a European IST project on "Distributed Virtual Laboratories" (DiViLab), in which it is responsible for the areas of conceptual modelling (task analysis, task ontologies) and creativity tools for modelling and interactive documentation in scientific experimentation and discovery. This April,

Since its foundation in 1995, the COLLIDE group has conducted a number research projects in areas relevant to this proposal:

- Open distributed environments for collaborative learning (European projects DEMOS, 1996-97; NIMIS,1998-2000; DiViLab, 2000-02, SEED, 2001-2004)

- Multimedia and "roomware" concepts for academic teaching ("Electronic Lecture Hall" at Duisburg University; regional project IBL-GS, 1998/99)

- Analysis, modelling, and intelligent support of collaborative learning processes (Initiative "Net-based Knowledge Communication in Groups" of the German Science Foundation DFG, started in 1999)

## Short CVs of the key persons

COLLIDE was founded and is directed by **H. Ulrich Hoppe** who holds a full professorship for "Applied Computer Science and Computer Science Education" at the University of Duisburg. With an original background in mathematics and educational technology (Master in Mathematics and Physics from Marburg University, 1978; PhD in Educational Technology from Tuebingen University in 1984), Ulrich Hoppe has been working for about ten years in the area of intelligent user interfaces and cognitive models in HCI (Fraunhofer Society Stuttgart, 1984-87, GMD Darmstadt 1987-95), before he re-focused his research on intelligent support in educational systems and distributed collaborative environments. He joined the University of Duisburg as a full professor in 1995. He is a member of the Executive Committee of the International Artificial Intelligence in Education Society (AI-ED Society). Also, he is co-editor of the German interdisciplinary journal "Kognitionswissenschaft" (Cognitive Science), and he was one of the proposers of a new research initiative on "Net-based Knowledge Communication in Groups" which was recently accepted and established by the German Science Foundation (DFG). This initiative is devoted to further developing and studying networked media for supporting collaborative learning and knowledge management from an interdisciplinary perspective including cognitive science, social psychology, education, and applied computer science. Recently, he was one of the keynote speakers at the first European conference on Computer-Supported Collaborative Learning (Euro-CSCL in Maastricht, March 2001).

Other members of the COLLIDE research group who would contribute to this project are:

**Dr. Martin Mühlenbrock** has received his PhD in Computer Science in December 2000 with a thesis on the automatic action-based analysis of collaborative learning processes in open distributed environments. He is currently responsible for the DFG project on the analysis of collaborative learning in which he works, among other things, on the development of on an ontology of collaborative learning activities.

**Niels Pinkwar**t, graduated as a high school teacher in computer science ( M.Sc. level) from Duisburg University and currently working on the IST project DiviLab (IST99-12017). Engaged in research on using Activity Theory in systems design and on collaborative visual language environments for educational systems.

Within the Institute of Informatics and Interactive Systems, there is a close cooperation between COLLIDE and the research group on computer graphics and visualisation lead by **Prof. Dr. Wolfram Luther**. This group has been working on specialised learning environments for users with perceptual disabilities and on the authoring of highly interactive study materials for computer science (e.g., an interactive supplement to a Computer Graphics textbook co-authored by W. Luther).

## 2.2    University of Chile

## Partner profile

<u>Department of Computer Science of the Faculty of Engineering of Universidad de Chile</u>

The University of Chile is the oldest and biggest university in Chile and been leading the academic field in research activities as well as in the formation of  professionals and scientists. The Faculty of Engineering alone has some 5000 students and is responsible of carrying out an important part of the technological research carried  out in Chile. Its Department of Astronomy has an outstanding role in the astronomy in Chile and a high international reputation. The astronomy Department has a telescope for learning purposes in the environs of Santiago which will be updated in the near future to be controlled remotely.

The department of computer science is the biggest of its kind in Chile with respect to the number of students, professors, and also according to the amount and quality of research activities and publications. The department was one of the first in introducing Unix and internet in Latin America. It is nowadays responsible of the .cl Domain Name Service for Chile. The Department hosts two important centres "C5" and "AccessNova" which will participate in this project.

The C5 center arose from a proposal to the Ministry of Education by the University of Chile to develop activities in the realm of Education and  Computer Science for Project Enlaces. Enlaces provides educational establishments with the opportunity for innovation and change by supporting the insertion and integration of New Technologies of Information and Communication into the school system.

In order to accomplish these goals, the C5 centre counts on a significant amount of work with educational establishments in addition to its  research in Informatics and Education. Informatics and Education is a discipline that encompasses diverse areas of knowledge.  The Centre is  orientated towards offering different consultancy and training alternatives; as a result, schools can choose according to their particular needs, interests, and experience in Informatics and Education. This center, will be instrumental in the dissemination of the achivements of the project among the schools in Chile.

AccessNova started as a project aimed at introducing broadband communication in Chile financed by the Chilean Office for Scientific and Technologic Development (CONICYT). Nowadays it acts as a technological research center within the Department which works in close cooperation with the industry, serving as a link between the academic and the industry. It is now directed to the  of commercial systems which are innovative in the field of multimedia and networking.

## Short CVs of the key persons

**Nelson Baloian** is an Assistant Professor in the Dept. of Computer Science. He obtained his diploma of "Civil Engineer in Computing" from the Universidad de Chile in 1987. He joined the Department of Computer Science in 1989. In 1997 he obtained his PhD degree from the University of Duisburg thanks to a fellowship of the German Academic Exchange Service working on computer supported collaborative learning, first at the GMD-IPSI institute in

Darmstadt (1992-1995) and then joining the Collide research group at the University of Duisburg (from 1995 to 1997). After his PhD he rejoined the Computer Science department and joined also the Access Nova research programme where he works in the development of distributed systems supporting learning. Since April 2000 he is also visiting part-time professor at the University of Waseda in Tokyo. Currently he is a guest professor at the University of Duisburg.

**Jaime Sánchez**, Associate Professor in the Dept. of Computer Science, started his biology studies at the Catholic University of Chile in 1975, finishing in 1978 as Biology Educator. He pursued Master of Arts(1983), Master of Science (1984), and Ph.D.(1985) degrees at Columbia University, New York, USA. His doctoral dissertation was related to cognition, learning theories, and informatics in education. After that, he held a joined post-doctoral fellowship (1987) at Cornell University (Metacognition), Columbia University (Informatics and Education), and MIT(Computers and Learning). He has been researcher and professor in the University "Arturo Prat" (1986-1987) and University of Antofagasta (1998-1993). There he was the Director of Postgraduate Studies, Department Chairman and Director of the Educational Computing Center, besides to his teaching and research duties. In 1994 he joined the Department of Computer Science at the University of Chile. His work has been in the areas of Informatics, Education, and Cognition. He has been involved in research in the areas of Informatics and Education, Human-Computer Interaction, Educational Software, Multimedia/Hypermedia, and Computer Educational Games. Since 1995 he has joined the National Project on Informatics and Education, Enlaces, as the Director of the branch located in the Department of Computer Science, University of Chile.

**Nelson Zamorano** is an Associate Professor in the Physics Dept. of Universidad de Chile. He holds Master degree from Universidad de Chile (1974) and a PhD from the University of Texas at Austin (1979), both in physics. His speciality is theoretical physics and astronomy. Nelson Zamorano has been involved in several net-based teaching activities in his area. E.g., he has developed a net-based course on astronomy.

## 2.3    Växjö University

## Partner profile

School of Mathematics and Systems Engineering (MSI)

Växjö University started as a university branch to Lund University in 1967, became an independent university college in 1977, and a full university in 1999. The vigorous expansion of recent years has resulted in a university with approximately 10 000 students. About 1 500 of them are studying at the School of Mathematics and Systems Engineering (MSI), half of whom follow different study programmes and the other half are following single subject courses.

There are eight schools at Växjö University. These are, besides MSI, the School of Management and Economics, the School of Education, the School of Humanities, the School of Social Sciences, the School of Bio-Sciences and Process Technology, the School of Industrial Engineering and the School of Health Science and Social Work. Växjö University has about 650 employees, 80 of whom are employed by MSI.

MSI offers courses and research education in Mathematics, Physics, Engineering, Computer Science, Information Systems Science, and Media Technology. During the last ten years the Media Technology unit at MSI offers courses in the areas of hypermedia, multimedia design and Internet technology. This unit has participated in national and international projects related to multimedia design and distance learning. In most cases, the projects have dealt with multimedia and computer-support for education in traditional teaching and net-based distance learning settings.

Recently, MSI has started a new program named the Media Technology Research program. This program aims at providing a multidisciplinary environment for research and development intended to support learning and communication. The major goal of this program is to contribute to the development of new tools and methods for interactive multimedia and broadband mobile communication.

Växjö university has close links to the regional Science Center **Xperiment Huset**, which intends to cooperate with the COLDEX project. periment Huset is a non-profit organisation and is a member of NSCF the Nordic Association of Science Centres, and associated member of ECSITE, the European Collaboration for Science, Industry and Technology Exhibitions. The main task of Xperiment Huset is to promote the interest in science and technology among young students and the public in general. The centre is based on an exhibition with around 100 interactive experiments within physics, technology and human  perception. Programs comprise teacher training, activities with school classes, outreach school programs,  science shows and development of pedagogical methods. Specially we focus on gender issues. Xperiment Huset also manufactures and sells exhibits for science centres in Sweden, Europe and Central America.

## Short CVs of the key persons

**de Sousa Pires, Jorge:** Ass. Prof. Jorge de Sousa Pires is about to join MSI. Previously, he worked as a researcher and a senior lecturer at Uppsala University in Sweden for 17 years and in Apple Sweden in 1988 as their Research and Education Manager. Between 1998-1999 he worked at Malmö University with the specific goal of improving Computer Assisted Learning at that University.  He is the author of several books and numerous articles and he regularly opens major conferences in Education due to his experience of IT-based education and his knowledge of the trends of the emerging Broker Society.

**Cerratto, Tessy**: Teresa Cerratto, holds a PhD in Cognitive Psychology and Human Computer interaction. She is a post-doctoral researcher at KTH/IPLab in Stockholm since August 1999 and an associate researcher at Växjö university since January this year. Prior to these positions, she worked at the University of Paris 8, Department of Cognitive Psychology and at Centre National de la Recherche Scientifique (CNRS) in Lyon. Her main research interests are in how computers support communication and learning activities.

**Milrad, Marcelo:** Marcelo Milrad works as a researcher at the School of Mathematics and Systems Engineering at Växjö University (VXU) since November last year. His main research areas concern the design and implementation of interactive learning environments (ILE) and intelligent software agents as tools to support learning. Prior to entering VXU, he has been working at the Institute for Media Technology, at the Center for Human-Computer Studies (CMD) at Uppsala University, and at the Weizmann Institute of Science, Israel.

During the last years, Marcelo has been directly involved in the development of multimedia based learning environments both in schools and in industrial settings.

## 2.4    Universitaet des Saarlandes

## Partner profile

Computer Science Department

Saarland University was founded in 1948 by the French administration of the Saarland. It comprises schools of law, business, medicine, the humanities, the natural sciences, and engineering. Student enrolment is roughly 20000.

The Computer Science Department is one of the strongest in the country. It has high profile research groups in the following areas, programming languages and their implementation, data bases, information retrieval, and workflow, cryptography, algorithms and complexity, and computer architecture. Current student enrolment in Computer Science is roughly 1200.

The Computer Science Department, the neighbouring Max-Planck-Institute for Computer Science, the German Research Center for Artificial Intelligence, and the International Conference and Research Center for Computer Science in Schloss Dagstuhl together form one of the largest concentrations of computer science research in Germany.

The research group of Prof. Reinhard Wilhelm has played a central role in the ESPRIT project COMPARE and is currently involved in the ESPRIT project JOSES. The visualization research group lead by Prof. Wilhelm and Dr. Stephan Diehl has developed learning software, visualization technologies and distributed 3D internet applications.

## Short CVs of the key persons

**Dr. Stephan Diehl**, Computer Science Department, assistant professor received his MS in computer science as a Fulbright scholar at Worcester Polytechnic Institute, Massachusetts, in 1993, and his PhD as a DFG scholar at University of Saarland in 1996.  Stephan Diehl is currently assistant professor (wissenschaftlicher Assistant, C1) at the University of Saarland at Saarbrücken and works in the research group of Prof. Reinhard Wilhelm. Stephan Diehl is author of two books with Addison-Wesley and one with Springer Verlag and in the last four years he has published over 30 scientific papers about programming language theory, internet technology, visualisation, Java and VRML. He teaches courses and seminars at university and in industry about these topics. He is a professional member of the Web3D Consortium, which coordinates the development and standardization of 3D-technologies for the internet. Stephan Diehl was program chair of the Fourth International ACM SIGGraph Conference on VRML and Web 3D Technologies in 1999 and general chair of the same conference in 2001. Since summer 1998 he is project leader of the project GANIMAL sponsored by DFG (German Research Council), which develops generative approaches for learning software.

## 2.5 Fundacion Universidad Empresa

## Partner profile

The ILE-UNED Group

The Spanish Open University (UNED for short) http://www.uned.es, began its activities in October 1972 with the aim of making higher education accessible to anyone with the necessary aptitude and interest, regardless of formal qualifications. The UNED is an independent government-financed institution with its own board, administration and academic staff, and examination system. There are study centres associated with the university providing access to resources such as library or multimedia material, advice and counseling, as well as tuition and facilities for practical work. All certificates and qualifications obtained from the UNED have the same legal and academic status as those obtained from traditional higher education institutions. In essence, it is the UNED's teaching methodology that distinguishes it from the mainstream of Spanish higher education. The key to this methodology being the guided autonomous use made of printed and audiovisual teaching material, the tutorials given, and the ever-increasing use of the so called new technologies of information and communication. The UNED is proving to be an enormous success: with 160.000 registered students in the year 2000, it is one of the largest universities in Spain, with 58 study centres there, and 9 abroad (Bonn, Brussels, Caracas, Geneva, London, Paris and Rosario, Mexico D.R and Sao Paulo), and has a strong commitment towards the Latin American countries.

The recently formed Computer Science Department (LSI: Lenguajes y Sistemas Informáticos) is currently involved in teaching computer science in two centers: (1) Escuela Técnica Superior de Ingenieros Industriales (Industrial Engineering) and (2) Escuela Técnica de Ingeniería Informática. In addition to educational activities the department carries out extensive research and development work in 5 areas of specialization.

The ILE group, in the LSI Department, is strongly involved in basic and applied research on distance learning environments. Members of the group participate in the IFIP WG 3.6 on Distance Learning, as well as in RIBIE, an Iberoamerican network for computer based learning. We are also involved in the PROMETEUS MoU initiative and follow the study Groups of the IEEE Learning Technology Standards Committee (LTSC P1484).

Members of the research group have been involved in a variety of Spanish and EC funded projects, for example, **EPOS**: developing European learning through technological advance (DELTA exploratory action), **TOSKA**: tools and methods for knowledge based authoring (DELTA exploratory action**), ACQUILEX I, II:** Acquisition of lexical Knowledge for NLP Systems (BRA Esprit, 89-92, 93-95), **EuroWordNet** (LE 96-99), The **LE training showcase** (ElSNET & ACO*HUM 98/99), as well as projects funded by Spanish public Institutions together with private IT Companies: **CAPRA**, including a Natural-Language Interface for a tutoring system (83-88), **ESCAD** (92-95), a computer environment to support cooperative work for distance learning activities, **ITEM** (96-99) a system for Textual Information Retrieval with NLP techniques. Recent and current projects are **STEED** (97/2000) a telematic environment to support distance learners, and two EU projects: European Treasury Browser **ETB** (IST99-11781) devoted to build a Web educational resource metadata networking infrastructure for schools in Europe, and Distributed Virtual

laboratories **DiViLab** (IST99-12017) focusing on the design and implementation of computer models for supporting experimental activities.

Furthermore the group has developed services and products for the UNED students at a worldwide scale focusing on (1) improving the support given to the individual learner in distance education, (2) facilitating the authoring and production of interactive content material and, (3) providing computer environments for collaborative learning activities in a distance framework. The group is active in the organization of International Conferences, workshops and summer schools, for example, *The virtual campus: trends for higher education and training*, an IFIP event held at UNED in November 97.

## Short CVs of the key persons

**M.Felisa Verdejo** has been a professor of Computer Science at the UNED since 1991. She obtained a degree in Computing Science from the University Pierre et Marie Curie (Paris, Francia) in 1976, and a Ph.D. in Sciences from the Universidad Complutense (Madrid, Spain) in 1981. She has previously held lecturing posts at the Universities of the Basque Country (San Sebastian, Spain) and the Politécnica de Cataluña (Barcelona, Spain).

Her main research interests are in the areas of Natural Language Processing, and Interactive Systems to support human learning. She has been involved in national and international R+D projects related to DELTA, ESPRIT, SOCRATES and TELEMATICS APPLICATIONS for more than twenty years. Products and services from these projects are currently being used to support UNED students, covering a wide scope: technical studies, professional training and adult open learning. She is co-editor of the following books: Collaborative dialogue technologies in distance learning (Vol 133, Nato ASI Series, Springer-Verlag 1994) and The virtual campus: Trends for Higher Education and Training (IFIP, Chapman and Hall 1998), and has also published several papers in these areas. She has been appointed as an expert in several events organized by the European Community as well as the Spanish Research Agency. She has been recently involved in the organization of the First European Conference on Collaborative Learning participating in the Steering and Committee Programs.

**Beatriz Barros** received her Computer Science degree in 1994 and her Ph.D. in Computer Science in 1999 at the Technical University of Madrid (UPM). She has been a lecturer at the UNED since 1996. She has been working in research projects on collaborative systems and collaborative learning applications during that time. She was involved in the STEED project (the development a telematics support system for distance learning) and is currently working in the DiViLab project (the development of a virtual laboratory environment for distance learning).

**Tim Read** obtained a degree in Computer Science from the University of the West of England in 1991 and a Ph.D. in Cognitive Science from the University of Birmingham four years later. He has held teaching posts at the University of Birmingham and the University of Granada, and is currently an associate lecturer in the UNED. He has also held professional engineer posts in multinational companies such as STC Components (formerly a branch of ITT), Rolls Royce, and Hewlett Packard. His research interests include computational linguistics, distributed systems, and distance learning environments, and is currently involved in two externally funded research projects: Hermes (the generation of electronic libraries based upon multilingual text recovery and semantic extraction; funded by the Spanish government) and DiViLab (as per the previous entry; funded by the European Commission).

**Miguel Rodríguez-Artacho** received his Computer Science degree in 1994. M.S. on Telecommunications Systems and Computer Networks in 1998 and Ph.D. in Computer Science in 2000. He is assistant professor at UNED University since 1995 and has participated as researcher in national and international R+D projects in the areas of Learning Technologies, learning standards and collaborative learning systems. He participates now in the development of STEED and DiViLAB projects to improve science and engineering distance learning systems and also with some regularity in different learning technologies normalization committees like CEN/ISSS WS and IEEE LTSC.

## 2.6    Universidad Politécnica De Madrid

## Partner profile

The *Universidad Politécnica de Madrid* (UPM) has about 40.000 students and over 5.000 employees. Its primary objective is the formation of graduates in the sciences of technology of engineering, architecture and computing. Also, it is made up of many of the most recognized and ancient technological centers in Spain. UPM has a very large experience in transferring R&D results to the industry and in participating in R&D European projects, being this work co-ordinated by its OTRI (Industrial Results Transfer Office).

The researchers belonging to the UPM who are going to participate in this project have a large experience in research projects including projects in the European frameworks. Following are the main European projects in which we have been involved during the last years:

- ° BRITE-4336-CT91.0393 "On-line Quality Control of Strip Cast Aluminium Alloys"

- ° CRAFT-29 "Artificial Vision System for Edge Detection of Stacked Furs"

- ° CECA PP-183 "Experte Multisensorial System for Quality Control of Cold Strip Moving at High Speed"

- ° ESPRIT-623 "Operation Control for Robot System Integration in CIM"

- ° ESPRIT-2202 "CIM-PLATO: Computer Integrated Manufacturing System and Process Execution Planning Toolbox"

- ° ESPRIT-2483 "PANORAMA: Perception and Navigation Organization for Autonomous Mobile Application"

- ° ESPRIT-6447 "HINT: Heterogeneous Integration Architecture for Intelligent Control Systems"

- ° ESPRIT-6450 "Robot Assembly System for Computer Integrated Construction"

- ° ESPRIT 7280 "ATLAS: Architecture, Methodology and Tools for Computer Integrated Large Scale Engineering"

- ° ESPRIT-8286 "Cost Effective Robot Conttrol System"

- ° ESPRIT 9049 "PDTAG-AM: Product Data Technology Group"

- ESPRIT-22130 "DIXIT: Distributed Information Technology for Strategic Multiobjective Process Control"

- ESPRIT- 23011  "IMDEX: Integrated system for multimedia indexing, matching & classification"

- INTAS  "DYROS: Dynamic Robot Simulation"

- TMR  "Mobile Robotics Technology for Health Care Services Network"

- IST-1999-11056, "PSI3: Personalized services  for integrated Internet Information"

- IST- 1999- 10258, "DOTS: Distributed Objects Telecontrol Systems and Networks"

- IST-2000-28443, "PERSEO, Personalized Multichannel Services for Advanced Multimedia Stream Management"

- IST- 2000- 29456, "Web Fair: Web Access to Commercial Fairs Through Mobile Agents"

- EURET. Proyecto VII/92-B2H1 de la Dirección General de Transportes de la Comisión de las Comunidades Europeas:  "The direct compatibility of the bimodal rail road techniques of combined traffic and the possibilities of utilization as pilot projects for international traffic".

- EURET. Dirección General de Transportes de la Comisión de las Comunidades Europeas: "Smart Inter Modal Transfer (SIMET)".

- EURET. Dirección General de Transportes de la Comisión de las Comunidades Europeas: "ADRIA: Advanced Crash Dummy Research for Injury Assessement in Frontal Test Collisions". Diseño de un nuevo dummy que cumpla con nuevas especificaciones. Ref. RO-97-SC.1074

- DGIB de la Comisión de las Comunidades Europeas: "Creación del Centro Piloto Nacional para la Formación Profesional en Mecánica Automotriz (CEMA) en Venezuela" REF: VEN/B7-310/96/119-01

UPM is also involved in several national research projects and has established very important collaboration links between European Community and Latin-America centers.

UPM contributes to the project its large experience in self-learning via Internet. In this sense, during the last five years UPM has developed several National projects in the area of remote self-training, focusing in fields such as VR/3D modeling and simulation, image processing, automatic control and elasticity and material resistance. Its main technological contributions are related to video sequence handling, remote control of physical devices and management of shared resources accessed by several users.

## Short CVs of the key persons

**Prof. Jesus Felez** received his Mechanical Engineer and Doctoral degrees from the University of Zaragoza in 1985 and 1989. He started as Associate Professor at the Polytechnic University of Madrid in 1990 and becomes Full Professor in 1997. His main activities and

research interests are mainly focused in the field of simulation, computer graphics and virtual reality. His research includes simulation techniques based on bond graph methodology integrating computer graphics and virtual reality techniques, mainly addressed to the development of simulators. He has published over 50 technical papers and has been actively involved in over 25 research and development projects. He has served as thesis advisor for 30 master's theses and four doctoral dissertations. Prof. Felez is member of ACM, SCS and IEEE having a very active participation. He is also member of the International Program Committee of the Bond Graph Modeling Conference of SCS and he is he is regular reviewer of papers for technical journals, transactions and conferences like Journal of the Franklin Institute and Simulation.

**Dr José María Sebastián** received the Automatic Control and Electronics Engineer and Doctorate engineering degrees from Universidad Politécnica de Madrid (UPM) in 1982 and 1987 respectively. He has been associate professor at UPM since 1987 and teaches courses in automatic control, computer vision and manufacturing automation. He has participated in many research projects regarding the introduction of Computer Vision techniques in the Industry, focussed on three main application areas: Automated visual inspection, 3D vision and Visual information management systems. He has participated in projects funded by the EU, like ESPRIT, EUREKA, BRITE and CECA. During the last years he has developed some projects concerning remote training via the Internet, in which different physical devices may be controlled and visualized. Dr. Sebastián is author or co-author of 50 international publications in different journals and symposia. He is member of IFAC, IEEE and SPIE. He is also a regular reviewer of papers for technical journals, transactions and conferences.

## 2.7   INESC - Instituto de Engenharia de Sistemas e Computadores

## Partner profile

INESC - Instituto de Engenharia de Sistemas e Computadores (Institute for Systems and Computer Engineering) is a private, non-profit association, dedicated to research, technological development, technology transfer and advanced training in information technologies and telecommunications. INESC was legally incorporated in August 1980; (following a joint executive order between the Ministry of Transports and Communications and the Ministry of Education, published in the DR Nº 167 of July the 22nd 1980). Recognition of its research activity has led the Prime Minister to declare INESC as an Institution of Public Interest on 6 February 1987.

Since its creation, INESC has succeeded in finding the organisational formulas that enabled it to tackle the tremendous increase of activities, fruit of the continuous enlargement of R&D activities and advanced technological professional training, allowing it to maintain a high level of productivity both in R&D and in service supplying. Throughout its existence, INESC has developed R&D and technological training activities, in what has become a model of University-Industry relationships, being the first institution in Portugal to show that even in a less developed country, Research and Development has its worth and place in the social-economic context. Nowadays the INESC model is a paradigm of the University's bonds with the outside world, combining the enterprise management's rigour with the university environment and scientific creativity in a flexible institutional way. Innovation would not occur without such links.

Innovation and Technological Transfer has always been considered as a key field of INESC's actions. It is well-known for its importance in creating and increasing the value of the Portugese SME's, with which the institution maintains close links through various contracts of technical and specialised assistance. In addition, INESC has applied for a group of supporting actions in the PEDIP (Specific Programme for the Development of the Portuguese Industry), which aim at the establishment of several demonstration units and technology transfer centres, for the reinforcement of its technological transfer capacity towards Portugese companies. If, as seems likely, PEDIP supports INESC's proposal, INESC will be able to maintain an important and continuing technological transfer capacity towards the industrial activity in Portugal. So, industry will find in this institution the privileged interface, through which they gain easy access to creativity, innovation, methodologies, and even prototypes of high commercial value and specialised knowledge capable of recommending present and future action, as well as to specialised know-how.

In fact, INESC combines an entrepreneurial management with academic creativity which results in a special institutional flexibility. Scientific research and technological development activities are currently structured in four scientific-technological areas: telecommunications and new services, computers and informatics, electronic systems and technology, and computer integrated manufacturing. Each area is chosen to have strategic character and be pertinent to current scientific-technological domains of activity.

INESC has participated and is participating in quite a few European projects and initiatives: ESPRIT (44 Projects), RACE (3 Projects), EUREKA (4 Projects), BRITE/EURAM (2 Projects), DELTA (2 Projects), SFS/NATO (2 Projects), SPRINT (participation in 3 Projects being evaluated by the Commission), AIM (4 Projects), COMETT (2 Projects), COMAC/BME (2 Projects), SCIENCE, COST, CTS, Y-NET, JESSI, OMI, ESSI. These strengthen and increase INESC's institutional connections at an international level; for example, in the first semester of 1990, INESC maintained connections with 50 partners in the U.K., 50 in France, 35 in Italy, 28 in Germany, and 16 in Denmark. These data underscore the fact that INESC is integrated in an international institutional network of great relevance, with supported links in a strong field of personal relationships between its researchers and their project colleagues from other institutes in other countries. INESC can be found on the Web at www.inesc.pt.

## Short CVs of the key persons

**Professor Ana Maria Severino de Almeida Paiva** is a senior research member of INESC and a Professor at Instituto Superior Técnico. She is well known in the area of Intelligent Agents in Virtual Environments, Affective Interactions, User Modelling and Artificial Intelligence Applied to Education. After her PhD in the UK at the University of Lancaster, she has worked in Germany (in GMD) and in France (CNRS-COAST team at the ENS of Lyon). In 1996 she returned to Portugal where she created a group on intelligent agents and synthetic characters. Her research is focused on the affective elements in the interactions between users and computers. She was member of numerous Program Committees of International Conferences, and workshops and was one of the co-chairs of the 1996 European Conference on Artificial Intelligence in Education. She has (co-)authored over 50 publications in refereed journals, conferences and books. She was co-ordinator in the participation of INESC within several European projects, such as the IDEALS (funded under the Telematics program), NIMIS, an I3-ESE project, DiViLab and Safira- recently funded.