EUROPEAN
COMMISSION

SCIENCE
RESEARCH
DEVELOPMENT

Accompanying Measures

Practical Training Courses

TRAINING AND MOBILITY OF RESEARCHERS 1994-1998

Information package - Annexes
(Proposal form)
Edition 1997
6th call - 972

Annex I
Proposal Form

NOTES

Before filling in this form, please read the relevant parts of the Accompanying Measures Information Package and the notes at the end of the form.

Note that the format and text of the proposal form should not be altered.
Proposals submitted on altered forms may be rejected.

Proposers working on the basis of the electronic version should download the proposal form using appropriate software. It may then be filled in on screen, in which case care should be taken not to alter the structure of the form. Alternatively, the blank form can be printed out and filled in using a typewriter or, through a process of trial and error, using a computer and its printer.

EUROPEAN COMMISSION
DG XII SCIENCE RESEARCH AND DEVELOPMENT
PROPOSAL FORM: Accompanying Measures of the TMR Programme

1. GENERAL PROPOSAL INFORMATION

Overall Proposal Title (1) →	EUROPEAN RESEARCH ON NEW TESTBEDS (EUROBOT)
Disciplines (2) →	1 __I-07____ 2 ___I-05___ 3 ___M-31___ 4 __M-33____
Type of proposed activity (3) *(Mark 'X' for one only)* →	1_____ Euroconference 2______ Summer School 3__X___ Practical Training Course
Total cost of project →	ECU 97,700 = 27,950 + 31,000 + 38,750
EC funding requested (4)	
from TMR Programme →	ECU 37,650 = 11,*588* + *12,000* + *14,063*
from INCO Programme →	ECU 12,550 = 3,*863* + *4,000* + *4,688*

Scientist in charge of the proposal: this person will be the main contact point for public enquiries

Title; Family name →	Dr. DE LA ROSA i ESTEVA
First name →	JOSEP LLUIS
Organisation (if different from below) →	INSTITUT D'INFORMÀTICA I APLICACIONS
Telephone n° (5) →	+34-72-41 83 91
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Less Favoured Region (6) →	-

Responsible administrator in organisation who will sign the contract, if the proposal is selected.

Responsible administrator	
Title, Family name →	NADAL
First name →	BERTA
Telephone n° (5) →	34-72-418024
Fax n° (5) →	34-72-418031
Name of organisation →	UNIVERSITY OF GIRONA
Type of organization *(Mark X for one only)* →	1__X__ University/higher education instution 2____ Research organisation 3______ Industrial or commercial enterprise 4______ Other
Department/section →	VICERECTORAT DE RECERCA
Street/postbox, etc. →	PLAÇA SANT DOMÈNECH
City/Cedex →	GIRONA
Post code →	E17071
Less Favoured Region (6) →	-
ISO country code (7) →	ES

Reserved for Commission use	Reserved for Commission stamp

Read the full TMR Accompanying Measures Information Package before completing this form

2. OPERATIONAL SUMMARY OF PROPOSED EVENTS (7)

Proposal number: *(To be entered by the Commission)*	ERB __ __ __ __ __ __ __ __ __ __ __ __
EVENT N° →	1
Title of event (9) →	EUROBOT PRACTICAL TRAINING COURSE 98
Location / Country (10) →	ULM, GERMANY ___ LFR (5)
Duration in days →	5
Date (day/month/year) (11) →	06-JUN- 98 – 10-JUN- 98
Number of participants (12) →	15
Total costs in ECU →	ECU: 27,950
EC funding requested: (4)	
From TMR Programme →	ECU: 11,588
From INCO Programme →	ECU: 3,863
EVENT N° →	2
Title of event (9) →	EUROBOT PRACTICAL TRAINING COURSE 99
Location / Country (10) →	LONDON, UK
Duration in days →	5
Date (day/month/year) (11) →	30-NOV-98 – 04-DEC- 98 (provisional)
Number of participants(12) →	20
Total costs in ECU →	ECU: 31,000
EC funding requested: (4)	
From TMR Programme →	ECU: 12,000
From INCO Programme →	ECU: 4,300
EVENT N° →	3
Title of event (9) →	EUROBOT PRACTICAL TRAINING COURSE 2000
Location / Country (10) →	BARCELONA, ES
Duration in days →	5
Date (day/month/year) (11) →	06-DEC-1999 - 10-DEC-1999 (provisional)
Number of participants(12) →	30
Total costs in ECU →	ECU: 38,750
EC funding requested: (4)	
From TMR Programme →	ECU: 14,062
From INCO Programme →	ECU: 4,688

3. PROPOSAL ABSTRACT

PROPOSAL NUMBER ERB __ __ __ __ __ __ __ __ __ __ __ __
(To be entered by the Commission)

SUMMARY

This project, EUROBOT, is an innovative proposal involving both robotics (computer science and engineering) and social sciences. That is why we think it is fully ELIGIBLE for TMR. EUROBOT focuses on a new and promising testbed in research, transfer of technology, and the society-university paradigm development.

The core of EUROBOT can be summarised in one question: ”What kind of robot should be designed to enable a team to be well organised in order to solve a specific complex problem?”

The specific complex problem retained is, as a first step, the problem of playing football. Based on the rules of some international associations of researchers (FIRA and RoboCup), the football game is defined as follows*: the robots run and play completely autonomously in a special field under the conditions determined by the scientific community*. Researchers, then, evaluate the quality of the performance.

The game of playing football implies a lot of industrial problems because several issues must be taken into account simultaneously: dynamic environment, hostile environment and real-time operating conditions. The enumeration of applicable industries is very large. At present, in Asia, SONY, SAMSUNG and other enterprises are investing substantial amounts in this field of research. An analogy in Europe is highly recommendable and some initial public investments are necessary. One of the advantages of this project, is that it covers such a large scope of domains that its successful outcome can only be reached through the narrow collaboration between the university and industrial society.

EUROBOT proposes to use a testbed inspired by the football game. It consists of *co-operative* mobile robots that run in a *hostile dynamic* environment.

In general terms, this testbed contains the following benefits compared to existing testbeds,

- For University. Updating scientific challenges for new trends of artificial intelligence (AI) and software engineering, such as the chess game triggered challenges in the past.
- For Industry. Promoting investments in technological innovation, such as F1 car competitions encouraged the innovation in the automobile industry.
- For Society. Promoting technological entertainment using the wide public (laymen, institutions, university students and research institutions) interest in the game of football.

In fact, the subject of this proposal has already been placed in an open international discussion. Indeed, several competitions held in Korea in November 96 and June 97, and in Japan in August 97, proved that this subject is very promising at international level. Facing this, an European stream is under construction (today 14 countries in Europe, including the Mediterranean and Eastern countries, are participating in this project). This stream is certainly important compared to the 21 countries world-wide that are already working on the subject.

Three Co-ordinated Proposals

EUROBOT co-ordinates three TMR proposals at the present deadline:

- Mobility by means of technical courses for European staff, object of this proposal, presented by Spain.
- A yearly European conference, object of the second TMR proposal, presented by Dominique Duhaut, University of Paris VI, France.
- Summer Schools for European doctorate (and graduate) students, which will take place immediately after the scheduled Euroconferences. This is the object of the third TMR proposal, presented by Jeffrey Johnson, Open University, UK.

4.A. SCIENTIFIC INFORMATION - BACKGROUND

PROPOSAL NUMBER ERB __ __ __ __ __ __ __ __ __ __ __ __
(To be entered by the Commission)

THE EUROPEAN PROJECT ON NEW TESTBEDS

The aim in Europe is to help research teams to spend part of their research in this testbed so that the European technological resources could highly benefit and keep on being competitive with respect to Asia and America. This is therefore the proper moment to encourage basic events such as Euroconferences, **Practical Training Courses** and Summer Schools in order to avoid that European technology cannot keep up with the rest of the world. The scope of target groups includes qualified research groups from developed countries and meridian countries of the European Union and Eastern Europe. The countries carrying out pioneering work in this field, and included in this proposal, are: France, Spain, UK, Italy, Finland, Sweden, Germany, Austria, Portugal, Poland, Hungary, Rumania, Switzerland, and Israel.

The goal of this conference is set forth in the following points:

- **Senior Researchers**. Scientists will present to other senior researchers their basic research linked to the subject.

For this purpose an European committee has been created, consisting of senior researchers in the field. Here below follows a list in which for each country only one senior researcher is appointed:

Silvia Coradeschi	University Linköping	SWEDEN
Marie-Claude THOMAS	University of NICE	FRANCE
Paolo Dario	Scuola Sup. Santa Anna, of Pisa	ITALY
Jeffrey Johnson	Open University	UNITED KINGDOM
Gerhard Kraetzschmar	University of Ulm	GERMANY
Jgar VERNER	Technion-Israel Institute of Technology	ISRAEL
Juha Röning	University of Oulu	FINLAND
Josep Lluis de la Rosa	University of Girona	SPAIN
Peter Bikfalvi	University of Miskolc	HUNGARY
Krzysztof Kozlowski	Technical University of Poznan	POLAND

All these people have already worked in the domain of this testbed, by real or simulated robots.

- **Real Competition**. The real competition will be the real test of the theoretical aspects presented previously. A tournament will be held to evaluate the efficiency of the different research, technologies, and developments. As for the international development, we will start this type of competition by using the international rules edited by the FIRA and RoboCup community, which are the international organisations in this domain.

- **Summary Meeting**. A *summary meeting* will follow the competition. Conclusions about several aspects of the research will be obtained. Moreover, the industrial applicability will be evaluated. The definition of some standard platform for entertainment, research, and education will be defined. An European standard should emerge from these conferences to benefit the industry-university paradigm (today, the USA propose to build teams of robots with the requirements and objectives of this testbed, which can, and should be, done at an European level).

- **European Stream**. One issue of these EUROBOT Practical Training Courses is to present a large European stream of research in the major international conferences related to this subject: ICMAS, IEEE in Robotics and Automation, IJCAI, IROS (all of these conferences are associated to FIRA or RoboCup competition).

REMARK . These European Practical Training Courses need to be supported at least 3 years to allow the promotion of the industrial interest in the technology of the European research laboratories.

IMPORTANCE AND BENEFITS OF THESE PRACTICAL TRAINING COURSES

The Euroconferences will contain scientific “competitions”. They will be an European alternative (balance, equilibrium) to the actual competition sponsored by IEEE Robotics and Automation Society, AI societies, and the FIRA organisation of Korea and RoboCup of Japan.

The EUROBOT Practical Training Courses aim to explain and exchange recent technological and scientific improvements and developments of the participating teams all over Europe. This has an extraordinary added value because *real demos for skilled senior researchers are the basis of these courses*. Real demos imply to have robotic teams’ participants in scientific competitions, where all technical features are tested in real-like operating conditions. *Real demos contain obviously much more added value than the existing videotape based or simulation results*. This added value is due to in site inspection developments by people from other research teams, and the scientific discussion is therefore richer. To organise this kind of events in Europe is necessary in order to have sufficient skilled robotic and human teams and to maintain an European leadership in the international community.

RELATION OF THE EUROBOT AND THE INTERNATIONAL COMMUNITY

This idea is refereed world-wide by important scientists in the field of robotics and artificial intelligence who are already involved in this kind of research:

Here is a list of very active people (outside of Europe) in the field of mobile robotics research with this testbed:

Minoru ASADA	University of Osaka	Japan
Alan MACKWORTH	University of British Columbia	Canada
Sean LUKE	University of Maryland	USA
Hiroaki KITANO	Sony Computer Science Laboratory	Japan
Itsuki NODA	Electromechanical Lab Tokyo	Japan
Andrew PRICE	Royal Melbourne Inst of Technology	Australia
John Hwan KIM	KAIST Taejon	Korea
Tishio FUKUDA	Nagoya University	Japan
Randy SARGENT	Newton lab, MIT	USA
Manuela VELOSO	University of Carnegie Mellon	USA

This list tries to show that this subject is alive in several very famous centres of research.

WHAT IS THE IMPORTANCE FOR THE INDUSTRY

Leading private multinational companies from Japan (SONY and HONDA), Korea (SAMSUNG and LG) and the USA (SUN) invest a lot in this idea and aggressively compete with each other. We expect that European industries (THOMSON, and others) will join this project in the following years.

ABOUT YOUNG RESEARCHERS. THEY ARE SPECIAL TARGET BECAUSE EUROBOT IS HIGHLY APPEALING.

Young researchers are the special target of this proposal since the EUROBOT ideas are especially attractive for the younger scientific generations. They will have much more facilities to TEST technology and PROVE research on this testbed (which will become universal in few years) than older scientists had some time ago. Industrial developments will be transferred more easily than before from universities and research centres to the industry, because the

EUROBOT Euroconferences will be the ideal demonstration environment for both research and industrial needs. And, the Practical Training Courses will be the tool to convince seniors to create research teams on the topics promoted by the testbed. It is absolutely necessary to be competitive, and leaders, in this cutting edge technologies and to improve the research-industry transfer. Therefore, it is of the utmost importance to have younger scientific generations skilled in this testbed. Since this testbed is a big integrated system, interdisciplinary research and researchers (at any age) from several backgrounds will work on it. They will learn to deal with as well time constraints, material development, teamwork, industrial delays as the proper interface to the industrial development. That is why these TMR Practical Training Courses are so essential for the related TMR series of EUROBOT Euroconferences and Summer Schools.

Remark that the participation of senior researchers to call for PhD students in the competition is crucial.

To invite researchers from eastern European countries is also considered. They equally have technological lacks to enter in these EUROBOT conferences, thus this action tries to promote their participation.

These courses are necessary to introduce doctorate students into this new field and to spread robot-football teams based research all over Europe. The Practical Training Courses are oriented to obtain new human teams around the subject who participate in European and world competitions and who start their research in the testbed of this proposal.

A non-exhaustive list of subjects to be analysed in the Practical Training Courses follows hereafter:

Electronics & Communication
Software design & Real-Time Control
Mechanics & Energy
High speed control & Supervision
Artificial Intelligence (AI)
Vision & Sensors
Agent Behaviour & Distributed AI
Simulation & Real systems implementation.

Courses development

The courses are introductory for senior researchers to understand the management of technology and research in this testbed. The senior researchers who participated in previous international conferences will explain their experiences about the testbed from a scientific, industrial, educational, and social impact point of view.

FURTHER INFORMATION ABOUT THE FIRST EVENT IS SET FORTH IN SECTION 4.C

Electronics & Communication	Software Design & Real-Time Control	Robotics	High Speed Control & Supervision
Peter Kopacek & Industrial partner	Dominique Duhaut & Industrial partner	Paolo Dario & Industrial partner	Joseph Aguilar

Artificial Intelligence (AI)	Vision & Sensors	Agent Behaviour & Distributed AI	Simulation
Ramon L. De Mantaras	Jeffrey Johnson & Industrial Partner	Jörg Müller	Juha Röning

Experts are described at the end of this 4.A part.

Recognised Experts.

The variety of teachers for Practical Training Courses and related series of Summer Schools will range from very senior researchers to the very active participants in the EUROBOT testbed.

1. Paolo Dario, Scuola Superirore Santa Ana, Pisa, Italy, dario@shamash.sssup.it
   Contact person → Luca Odetti, luco@shamash.sssup.it

2. Joseph Aguilar-Martin, LAAS-CNRS, Toulouse, France, aguilar@laas.fr
3. Ramon Lopez de Mantaras, IIIA-CSIC, Barcelona, Spain, mantaras@sinera.iiia.csic.es
4. Walter Graeffe, Universität der Bundeswehr, Munchen, Germany
5. Peter Kopacek, Technical University of Vienna, Kopacek@ihrt1.ihrt.tuwien.ac.at
6. Josep Amat, UPC, Barcelona, Spain.
7. Antoni Ligeza, Institute of Mining, Cracow, Poland, ali@ia.agh.edu.pl, ligeza@eia.udg.es
8. Juha Röning, University of Oulu, Finland, Juha.Roning@oulu.fi
9. Jörg Müller, jpm@dlib.com
10. Dominique Duhaut, Paris VI, Paris, France, ddu@robot.uvsq.fr
11. Jeffrey Johnson, Open University, London, U.K., J.H.Johnson@open.ac.uk
12. Josep Ll. de la Rosa, IIiA, Girona, Spain, peplluis@eia.udg.es
13. Alexis Drogoul, LIP6, Paris, France.
14. Krzysztof R. Kozlowski, Poland, kk@ar-kari.put.poznan.pl
15. Joan Batlle, IIiA, Girona, Spain, jbatlle@eia.udg.es
16. Jussi Suomela, HUT, Helsinki, Finland. Jussi.suomela@hut.fi
17. Peter Bikfalvi, University of Miskolc, Hungary, bik@mazsola.iit.uni-miskolc.hu
18. Silvia Coradeschi, Univesity Linköping, Sweden, silco@ida.liu.se
19. Marie-Claude Thomas, University of Nice, France
20. Gerhard k. Kraetzschmar, University of Ulm, Germany, gkk@neuro.informatik.uni-ulm.de
21. Igor Verner , Technion-israel institute of technology, Israel, ttrigor@techunix.technion.ac.il

4.B. SCIENTIFIC INFORMATION - EXPECTED IMPACT

PROPOSAL NUMBER ERB __ __ __ __ __ __ __ __ __ __ __ __ __
(To be entered by the Commission)

EXPECTED RESULTS

EUROBOT offers significant long-term challenges, which will take over a few decades to accomplish. However, the clarity of the final target allows deducing several sub-goals which define mid-term and short-term challenges. One of the major reasons why EUROBOT attracts so many researchers, is that it requires the integration of a broad range of technologies into a team of complete agents, as opposed to a task-specific functional module. The list of long-term research issues is extremely broad. It is clear that the challenges exposed in 4.A (abstract) will involve a broad range of technological issues ranging from the development of physical components, such as high performance batteries and motors, to highly intelligent real-time perception and control software.

The mid-term technical challenges, which are the target for the next 10 years, are more concrete, and a partial list of specific topics can be compiled. Hereafter follows a partial list of the research areas involved in EUROBOT, to be carried out within a mid-term time span:

- Integrated Systems
- Agent Architecture in general and Multi-agent systems in general
- Combining reactive approach and modelling/planning approach
- Real-time recognition, planning, and reasoning
- Reasoning and action in dynamic environment
- Sensor fusion
- Behaviour learning for complex tasks
- Strategy acquisition
- Cognitive modelling in general
- Mechatronics
- Real-time systems
- Entertainment Robotics

In addition to these technologies, providing network-based football server with high quality 3D graphics capability requires a substantial progress of the technologies to be applied to the real-time animation of simulated football players and the network-based interactive multi-user server system. These are key technologies for network-based services in the coming years.

The EUROBOT challenge should be understood in the context of larger and longer term challenges, rather than a one-shot challenge. Thus, we wish to provide a series of short-term challenges, which automatically lead to the accomplishment of the mid-term and long-term challenges.

ABOUT THE IMPORTANCE OF ENTERPRISE PARTICIPATION

We are doing a prospective work on the collaboration of companies in this project. The interest of multinational companies from Asia and America makes us confident that we will succeed in the obtaining of the participation of European enterprises. The big European companies that are potentially interested are THOMSON, FRANCE TELECOM, PHILIPS, ALCATEL, etc.

DIFFUSION OF THE CALL FOR PARTICIPATION AND DISSEMINATION OF RESULTS

For the scientific diffusion: the call for participation will be diffused by the Internet, through the proceedings of EUROBOT, and through the co-operation of the international community that is refereeing on the EUROBOT events (see the call for papers in the next sections).

For the industrial companies and public diffusion: these events will receive big announcement by standard media like TV, radio, and newspapers. Actually, several channels of TV and a lot of newspapers already discussed this idea. Just as an example, two major French newspapers (*le Monde*, and *le Figaro*) and two mass French journals (*VSD*, and *Science et Avenir*) and several French, Spanish, British and American TV channels (*Canal Plus* France and Spain, *TV3*, *LCI*, and CNN international) have spoken about this event.

EUROBOT in fact presents the first Practical Training Course as the first event of a series. Taking into account the big expectations and the very long-term issues of the proposal, there exist big guaranties that this event will last for several years.

MORE INFORMATION ABOUT THE FIRST EVENT ENCLOSED IN 4.C ADDITIONAL ELEMENTS.

4.C. SCIENTIFIC INFORMATION - ADDITIONAL ELEMENTS

PROPOSAL NUMBER ERB __ __ __ __ __ __ __ __ __ __ __ __
(To be entered by the Commission)

Operational Summary of Proposed Events

Months	**Year**	**Euroconferences**	**Summer School**	**Practical Training Courses**
January-March	1998			
April-June				June'98 Benchmark Ulm, Germany
July-September		July'98 EUROBOT'98 Paris. // IMACS'98	July-August '98 Paris	
October-December				Dec'98 London
January-March	1999			
April-June				
July-September		July '99 EUROBOT'99 Stockholm	July-August '99 Stockholm	
October-December				Dec'99 Barcelona
January-March	2000			
April-June				
July-September		July-Sept. 2000 EUROBOT'2000 Barcelona	Oct'2000 London (depending on Euroconference)	
October-December				Dec'2000 Pisa

Note that the Practical Training Courses are connected to the Euroconferences. This stimulates the attendance of senior researchers at the Practical Training Courses where they will be introduced in the very large possibilities and constraints of the testbed.

Here follows more information about the first event, the 1st EUROBOT Practical Training Course that is to be held in parallel to the *Ulm Robotics Week,* in Germany.

1st EUROBOT Practical Training Course

Date: June 6 to June 10, 1998
Detailed schedule of events will be sent in a follow-up email!
The first EUROBOT Practical Training Course and all EUROBOT events will have the preliminary meeting in the *Ulm Robotics Week*. Date: March 21 to March 28 or 29, 1998
Details of the 1st EUROBOT Practical Training Course will be obtained from the senior organisers as shown in section 4.A, together with the experience from this preliminary event.

Introduction

What is The Ulm Robotics Week?

It is a bundle of robotics events. The *EUROBOT* Trials are the main event, where teams of both real and simulated robots play soccer. Three workshops on *Co-operative Robotics*, on *Multi-agent Systems and Simulation*, and on *Innovative Science and Engineering Education* provide a forum for scientific exchange. A number of tutorials, in terms of *Practical Training Courses* for senior researchers, allow novices and experienced participants to learn more about specific topics and to gain practical experience in building and programming robots during the accompanying lab sessions. The public, media and press are invited to watch the final competitions of the various events. Several organisational meetings (EUROBOT Committee meeting, etc.) and social events (excursion to Daimler, dinner, etc.) round up the list of events.

Why do we want The Ulm Robotics Week?

There are scientific, educational, and organisational reasons for such an event. Therefore, we expect that a significant number of people will attend. We estimate an attendance of 10 to 40 European researchers, 10 to 40 German researchers, about one or two dozen local university students, about 20 high school students, and about 10 adult students and high school teachers.

The scientific reasons are that the exchange of both theoretical and practical scientific experience in a number of areas, including robotics, vision, real-time control, neural networks, evolutionary computation, artificial intelligence, intelligent agents, and multi-agent systems, is fostered. The educational and organisational reasons include the ability to organise a series of tutorials on a wide range of topics related to the above fields with a significantly reduced cost, if organised at the same time than the Practical Training Courses. In addition, a great learning opportunity is provided for local, German, and European students of various age groups.

Which development led to The Ulm Robotics Week

Besides having participated in the *Robot Building Lab* at AAAI-93 and enjoyed the thrill of building and programming robots to compete on a task, I have been actively involved in a number of similar events at universities and colleges, research institutes, conferences and summer schools.

At IK-97, we met several colleagues and professors, some of whom have participated in former Robot Building Labs. They expressed a strong interest in a new event that -- among other activities – would include Robot Building Lab activities and provide an opportunity for German roboticists and educators to meet.

At IJCAI-97 in Nagoya, Japan, the EUROBOT Committee was created. One of the first decisions was to hold a EUROBOT Trial about 3 months before the next RoboCup World Championships in Japan. Gerhard K. Kraetzschmar offered to organise this event in Ulm.

Advisory Board in Germany

- Günther Palm, University of Ulm
- Bernhard Nebel, University of Freiburg
- Jörg Siekmann, DFKI and University of Saarbrücken group in Germany
- Wolfgang Wahlster
- Uli Furbach
- Wilfried Brauer
- Armin Cremers
- Steffen Hölldobler

Overview of Events

The following events are planned for the Ulm Robotics Week:

- EUROBOT Trials
- *Robotics Tutorials oriented to the 1st EUROBOT Practical Training Course.*
- Robot Programming Lab (for researchers and college students)
- Workshop CR-98: Co-operative Robotics -- The RoboCup Challenge
- Workshop MASSIM-98: Multi-agent Systems and Simulation – The RoboCup Challenge
- Workshop SEE-98: Science and Engineering Education High school students RBL (optional, in German only)
- Adult education RBL (optional, tutorial in German only)
- Robot Exhibition and Demonstration
- EUROBOT Committee Meeting
- Press Conference (optional)
- Opening Reception, Farewell Party (mandatory), Banquet (optional)

EUROBOT Trials

The main event during the Ulm Robotics Week are the EUROBOT Trials, which present a forum for EUROBOT teams to test their technology under real competitive conditions. According to the subdivisions of RoboCup Competitions, determined by the International RoboCup Committee, we will have three categories of trials:

- Simulator League Trials
- Small Robot League Trials
- Medium-Size Robot League Trials

The primary goal of these events is to provide an opportunity for practical sessions and a forum for the exchange of scientific and engineering experience for potential participants of RoboCup-98 (to be held in Paris in July 98). Anyone interested in participating in Paris is strongly encouraged to use this opportunity and to make his team even stronger for Paris. In order to foster this intention, we will try to restrict media and press coverage to a single day, when finals will be played.

Preliminary list of interested participants in Germany (to be extended):

- Humboldt University Berlin (Prof. Hans-Dieter Burkhard)
- University of Ulm (Prof. Günther Palm, Dr. Gerhard Kraetzschmar)
- University of Dortmund (Prof. Katharina Morik)
- University of Freiburg (Prof. Bernhard Nebel)
- DFKI (Prof. Wolfgang Wahlster + Dr. Elisabeth Andre)
- University of Chemnitz-Zwickau (Prof. Dilger)
- GMD (Prof. Thomas Christaller)

There are more interested participants from all over Europe.

Tutorials (Co-ordinated with the 1st EUROBOT Practical Training Course)

A variety of tutorials, which are open to all participants, are planned.

Anyone who plans to give a tutorial at the first EUROBOT Practical Training Course (in June '98) or Summer School (in August '98) is given the opportunity to test his tutorial in Ulm.

A list of possible tutorials (together with potential speakers in collaboration with the general Training Staff described in section 4.A) is given hereafter:

- Robot Building Lab Tutorial (Kraetzschmar)
- Intro to RoboCup (Burkhard/ Kraetzschmar)
- RoboCup Simulator and Agent Prog Basics (Hannebauer/Wendler)
- Mobile bases, Kinematics and Dynamics (Tibken/Lahres/ Kraetzschmar)
- Motors and Energy (Tibken/Lahres/ Kraetzschmar)
- Intro to Real-time Control (Tibken/Lahres/ Kraetzschmar)
- Sensors for Mobile Robots (Kaiser/ Kraetzschmar)
- Survey of Electronics (Kaiser/Frank/ Kraetzschmar)
- Robot Programming Environments and Techniques (Enderle/Sablatnög/ Kraetzschmar)
- Robot and Agent Control Architectures (Beetz/Kraetzschmar/HDB/Fischer)
- Robot Localisation and Position Estimation (Burgard/Fox/Gutmann)
- Robot Vision (for RoboCup) (Neumann/Mallot)
- Robot Planning (Beetz)
- Robot Learning (Thrun/Burgard)
- Reinforcement Learning for Robotics (Kraetzschmar/Vollbrecht)
- Neural Networks for Robotics (Palm/Schwenker)
- AI Techniques for Robotics (Beetz/ Kraetzschmar)
- Evolutionary Computation for Robotics (Banzhaf)

A selection of them will be offered as a *Practical Training Course* for senior researchers.

Robot Programming Lab

A limited number of students work in groups to solve small robot programming tasks on our robots. The goal is to give students some practical experience with typical robot programming environments.

We have a variety of robots in our lab. We will probably be able to borrow extra robots from nearby labs, so that we may have available up to 12 or more Pioneers, 3 B21, a Nomad 200, between 4 and 10 Kheperas, and a variety of small LEGO-based or custom-built robots.

Workshop CR-98: Co-operative Robotics --- The RoboCup Challenge

- Co-operative Agents.
- Distributed Artificial Intelligence.
- Robotics & Autonomous Systems.

Workshop MASSIM-98: Multi-agent Systems and Simulation – the RoboCup Challenge

- Real-time simulation.
- Simulating physics.
- Weather circumstances.
- Virtual reality, 3D, ...

Workshop SEE-98: Science and Engineering Education

- robotics education for computer scientists
- technical education in high schools
- adult engineering education

High School Students Robot Building Lab

(a modified version of our classical RBL)

Adult Education Robot Building Lab

(see above)

Robot Exhibition and Demonstration

If you have a performant robot, then come and show it off...

Organisation of the Ulm Robotics Week

Local Organising Committee:

- Gerhard K. Kraetzschmar (Chair)
- Marlene Hartmann (General Administration)
- Stefan Enderle (Competitions and Trials)
- Thomas Boss (Competitions and Trials)
- Stefan Sablatnög (Tutorials)
- Volker Baier (Labs)
- Gerd Meyer (HW and SW set up)
- Thomas Ketterle (HW and SW set up)
- Hans Utz (Web Publications)

Available facilities

- H20 lecture hall
- Sun-Pool 1: 35 workstations
- Sun-Pool 2: 20 workstations
- PC-Pool: 40 PCs
- Ulm Robot Lab (robots.... plus more Pioneers from Tuebingen and Freiburg)
- Seminar rooms etc.
- Cafeteria, delivery services and nearby restaurant.

5.B. DETAILS OF PROPOSED SPECIFIC EVENTS: SUMMER SCHOOLS OR PRACTICAL TRAINING COURSES (12)

Event N° →	**1**
Title of proposed event →	EUROBOT PRACTICAL TRAINING COURSE '98

Organiser

Gerhard KRAETZSCHMAR Associate Professor University of ULM GERMANY

Teaching / training staff and participating experts (14)

Paolo DARIO	Professor	Scuola Sup. Santa Anna	ITALY
Josep AGUILAR	Senior Researcher	LAAS-CNRS	FRANCE
Peter KOPACEK	Professor	Tech. Univ. of Vienna	AUSTRIA
Ramon DE MANTARAS	Senior Researcher	IIIA-CSIC	SPAIN
Dominique DUHAUT	Associate Professor	University of Paris VI	FRANCE
Jeffrey JOHNSON	Associate Professor	Open University	UK
Juha RÖNING	Associate Professor	Oulu University	FINLAND
Jörg Müller	Research Engineer	Zuno Ltd	UK

They are the co-ordinators of the areas which compose the Practical Training Courses, that is described in section 4.A, and will participate in the first and, eventually, in the following EUROBOT Practical Training Courses.

Teaching / training material / special equipment to be made available to participants

- H20 lecture hall
- Sun-Pool 1: 35 workstations
- Sun-Pool 2: 20 workstations
- PC-Pool: 40 PCs
- Ulm Robot Lab (robots.... plus more Pioneers from Tuebingen and Freiburg)
- Electronic devices.
- Seminar rooms etc.
- Delivery services, cafeteria, and nearby restaurant

Participation (18)

We will use the same large diffusion as for EUROBOT 98 in Paris. The Practical Training Courses will call people for participation under the same conditions as for the series of Euroconferences that are organised in co-ordination with this proposal.

There is a special interest in and a priority given to target groups of young researchers from Less Favoured Regions and eastern associated European Countries.

The testbed used in this Practical Training Course is a LOW COST platform that will be simultaneously promoted for immediate use in ALL Europe. Such promotion aims to highly motivate wide participation in these Practical Training Courses.

Site of proposed event (15)

University of Ulm, ULM, GERMANY
Neural Information Processing
It offers good facilities for practical works in robotics and simulation. T**he venue can be easily reached as regular bus and railway services stop at the university**.

Advance publicity and proposed programme (16)

The diffusion will be linked to the excellent diffusion of the EUROBOT Euroconference.
The programme is described in section 4.C of this proposal. **This diffusion will provide enough information about the events to all target groups (scientific circles, young researchers, industries, women researchers and so on).**

5.B. DETAILS OF PROPOSED SPECIFIC EVENTS: SUMMER SCHOOLS OR PRACTICAL TRAINING COURSES (12)

Event N° →	**2**
Title of proposed event →	EUROBOT PRACTICAL TRAINING COURSE ‘99

Organiser

Jeffrey JOHNSON	Associate Professor	Open University	UK

Teaching / training staff and participating experts (14)

Paolo DARIO	Professor	Scuola Sup. Santa Anna	ITALY
Josep AGUILAR	Senior Researcher	LAAS-CNRS	FRANCE
Peter KOPACEK	Professor	Tech. Univ. of Vienna	AUSTRIA
Ramon DE MANTARAS	Senior Researcher	IIIA-CSIC	SPAIN
Dominique DUHAUT	Associate Professor	University of Paris VI	FRANCE
Jeffrey JOHNSON	Associate Professor	Open University	UK
Juha RÖNING	Associate Professor	Oulu University	FINLAND
Jörg Müller	Research Engineer	Zuno Ltd	UK

They are the co-ordinators of the areas which compose the Practical Training Courses, that is described in section 4.A, and will participate in the first and, eventually, in the following EUROBOT Practical Training Courses.

Teaching / training material / special equipment to be made available to participants

- H20 lecture hall
- Sun-Pool 2: 20 workstations
- PC-Pool: 40 PCs
- Open University Robot Lab.
- Electronic devices.
- Seminar rooms etc.
- Delivery services, cafeteria, and nearby restaurant

Participation (18)

We will use the same large diffusion as for EUROBOT 99 in Stockholm. The Practical Training Courses will call people for participation under the same conditions as for the series of Euroconferences that are organised in co-ordination with this proposal.

There is a special interest in and a priority given to target groups of young researchers from Less Favoured Regions and eastern associated European Countries.

The testbed used in this Practical Training Course is a LOW COST platform that will be simultaneously promoted for immediate use in ALL Europe. Such promotion aims to highly motivate wide participation in these Practical Training Courses.

Site of proposed event (15)

The Open University, LONDON
It offers good facilities for practical works in robotics and simulation. T**he venue can be easily reached as regular bus and railway services stop at the university**.

Advance publicity and proposed programme (16)

The diffusion will be linked to the excellent diffusion of the EUROBOT Euroconference.
The programme is described in section 4.C of this proposal. **This diffusion will provide enough information about the events to all target groups (scientific circles, young researchers, industries, women researchers and so on).**

5.B. DETAILS OF PROPOSED SPECIFIC EVENTS: SUMMER SCHOOLS OR PRACTICAL TRAINING COURSES (12)

Event N° → **3**

Title of proposed event → EUROBOT PRACTICAL TRAINING COURSE 2000

Organiser

J. Ll. de la ROSA	Associate Professor	University of Girona	SPAIN

Teaching / training staff and participating experts (14)

Paolo DARIO	Professor	Scuola Sup. Santa Anna	ITALY
Josep AGUILAR	Senior Researcher	LAAS-CNRS	FRANCE
Peter KOPACEK	Professor	Tech. Univ. of Vienna	AUSTRIA
Ramon DE MANTARAS	Senior Researcher	IIIA-CSIC	SPAIN
Dominique DUHAUT	Associate Professor	University of Paris VI	FRANCE
Jeffrey JOHNSON	Associate Professor	Open University	UK
Juha RÖNING	Associate Professor	Oulu University	FINLAND
Jörg Müller	Research Engineer	Zuno Ltd	UK

They are the co-ordinators of the areas which compose the Practical Training Courses, that is described in section 4.A, and will participate in the first and, eventually, in the following EUROBOT Practical Training Courses.

Teaching / training material / special equipment to be made available to participants

- H20 lecture hall
- Sun-Pool 2: 20 workstations
- PC-Pool: 40 PCs
- IiiA Robot Lab in Girona.
- Electronic devices.
- Seminar rooms etc
- Delivery services, cafeteria, and nearby restaurant.

Participation (18)

We will use the same large diffusion as for EUROBOT 2000 in Barcelona. The Practical Training Courses will call people for participation under the same conditions as for the series of Euroconferences that are organised in co-ordination with this proposal.

There is a special interest in and a priority given to target groups of young researchers from Less Favoured Regions and eastern associated European Countries.

The testbed used in this Practical Training Course is a LOW COST platform that will be simultaneously promoted for immediate use in ALL Europe. Such promotion aims to highly motivate wide participation in these Practical Training Courses.

Site of proposed event (15)

Institute of Informatics and Applications.
University of Girona, in BARCELONA, SPAIN
It offers good facilities for practical works in robotics and simulation. T**he venue can be easily reached as regular bus and railway services stop at the university.**

Advance publicity and proposed programme (16)

The diffusion will be linked to the excellent diffusion of the EUROBOT Euroconference.
The programme is described in section 4.C of this proposal. **This diffusion will provide enough information about the events to all target groups (scientific circles, young researchers, industries, women researchers and so on).**

6. DRAFT BUDGET

	Event 1	Event 2	Event 3
ESTIMATED EXPENSES			
Category A: Young Researchers			
Travel →	X 15 researchers 400	X 20 researchers 300	X 30 researchers 300
Accomodation →	X 5 days X 15 researchers 50	X 5 days X 20 researchers 50	X 5 days X 30 researchers 30
Participation fees →	X 15 researchers 500	X 20 researchers 500	X 30 researchers 500
	17,250	21,000	28,500
Category B: Invited Speakers			
Travel →	X 7 people 500	X 7 people 400	X 7 people 400
Accommodation →	X 5 days X 7 people 100	X 5 days X 7 people 100	X 5 days X 7 people 100
	7,000	6,300	6,300
	24,250 SUBTOTAL	27,300 SUBTOTAL	34,800 SUBTOTAL
Category C: Organisation			
Renting of venue →	0	0	0
Renting of equipment →	0	0	0
Mailings →	200	200	200
Printwork →	500	500	750
Publicity →	1,000	1,000	1,000
Secretarial support →	2,000	2,000	2,000
Other Expenses			
→			
→			
Total Estimated Expenses	**27,950**	**31,000**	**38,750**
ESTIMATED INCOME			
Requested TMR support →	**11,588**	**12,000**	**14,063**
Requested INCO support →	**3,863**	**4,000**	**4,688**
Conference fees →	**7,500**	**10,000**	**15,000**
Support from other sources →	**5,000**	**5,000**	**5,000**
Total Estimated Income	**27,950**	**31,000**	**38,750**

7. APPLICANT ORGANIZATION

PROPOSAL NUMBER
(To be entered by the Commission)

ERB __ __ __ __ __ __ __ __ __ __ __ __

Similar proposal submitted to an EC programme (19)

Have you submitted a similar proposal before? → (State Yes or No) If Yes, state: Name of programme → Year of submission → Proposal (or contract) n →	NO, because this is an extremely INNOVATIVE and new way of holding Practical Training Courses

Previous experience with similar events (20)

The organisers of these EUROBOT Practical Training Courses are active members of the FIRA and RoboCup International Organisations which, up to now, organised THREE conferences in which all the organisers of EUROBOT have participated. Two of them were the ***FIRA RWC*** in November 9-12, 1996 and in June 1-5,1997 in Taejon, Korea, at which 90 researchers attended together with 200 attendants of the parallel SEAL event. The third previous conference was ***RoboCup*** in August 24-29, 1997 in Nagoya, Japan, at which 120 researchers attended, and in parallel, the IJCAI conference attracted 800 researchers.

A pre-event of EUROBOT is the ULM Robotics Week, where the final contents and methods to be applied to the series of Practical Training Courses will be discussed and proposed. Consequently, the series of Summer Schools and Euroconferences will be discussed and planned in detail.

Available resources (including staff) (21)

Mobile Robots and associated equipment from participant laboratories.
Josep Lluís DE LA ROSA, general chairman, 10% of work time.
Local Organising Committee, only 1person, 10% of work time.
Staff of the Practical Training Courses: 10 days per year.

Support from third parties (22)

- FIRA (Federation of International Robot-soccer Association), Taejon, Korea. Support to International Teams Participation (5,000 ECU).
- RoboCup (Association of Robot-Soccer World Cup), Nagoya, Japan. Support to International Teams Participation (5,000 ECU).
- SONY, HONDA, SUN, SAMSUNG, Japan and Korea. Support to events budget (20,000 ECU). These quantities will definitively be determined by their competitive position in the world market.

We certify that the information in this proposal is accurate and authorize the European Commission to use the information at their discretion in the performance of their duties.		Stamp of organization
Date September 25, 1997 Josep Lluís DE LA ROSA Signature of scientist in charge	Date September 26, 1997 Berta NADAL Signature of responsible administrator	

NOTES FOR COMPLETING FORMS

1. Not more than 20 words. The title should give a clear indication of the scientific subjects to be dealt with.

2. Choose up to four discipline codes from the list given at the end of this application form (e.g.E-06 for geophysics). Enter them in the order of relevance to the project.

3. Tick the type of event to which the proposal relates.

4. See relevant parts on budget, financial guidelines and allowable costs in Chapters 1, 3 and 7 of the TMR Information Package.

5. When filling in the phone and fax numbers, give the direct line if there is one, and type numbers in the following way:
   Country code - town code - local number
   For example, 44-171-123 4567 for a number in central London; 34-1-123 4567 for a number in Madrid.

6. If located in a Less Favoured Region (LFR), please indicate the LFR code (see page 47)

7. Use the following ISO country codes:

Austria	AT	Ireland	IE	United Kingdom*	GB
Belgium	BE	Italy	IT	Iceland	IS
Denmark	DK	Luxembourg	LU	Liechtenstein	LI
Finland	FI	Netherlands	NL	Norway	NO
France	FR	Portugal	PT	Switzerland	CH
Germany	DE	Spain	ES	Israel	IL
Greece	GR	Sweden	SE		

   For other countries, enter code OT.

   For organizations based in the UK, please also specify the legal jurisdiction: GBEW (England and Wales), GBNI (Northern Ireland), GBSC (Scotland).

8. If the proposed series includes more than three specific events, please copy the page as many times as you need.

9. Where each event has a different title, each title should give a clear indication of the scientific subject to be dealt with. Where this is not the case, reference to the 'Overall Proposal Title' may be made (e.g. state 'see above').

10. Places (e.g. town, country) must be indicated, even if provisional. Do not give name of a small place e.g. a village, without also the name of the province, region or nearest important town that enables it to be easily located.

11. Conference dates must be indicated, even if provisional. Type dates in the form: 'DD-MMM-YY' (e.g. for an event lasting from 30 September to 2 October 1997, write 30-SEP-97 - 02-OCT-97).

12. Give estimates, bearing in mind that the total number of participants should be between the following figures:
    Euroconferences or Summer Schools 30-100; Practical Training Courses 15-50.

13. If the proposal comprises more than one event, copy this page as many times as you need.

14. Please give names, nationality, and home institution of prominent speakers, training staff, committee members etc. and describe the role of each in the event.

15. For Euroconferences and Summer Schools, indicate the type of venue: conference centre, university, etc. and explain how it can be reached. For Practical Training Courses details must be provided with regard to the type of laboratory offering the course, its technical installations, scientific facilities and equipment, etc.

16. Please provide, preferably on a separate sheet, details of the programme of the event(s) and describe the publicity to be made to the following audiences:
    a. appropriate scientific circles
    b. young researchers
    c. special target groups such as researchers from industry, women researchers, and researchers who work in less favoured regions.
    d. other (specify).

17. While contractors are not obliged to publish proceedings or conference reports, the Commission should know whether the event is planned to lead to results in terms of publications, or otherwise lead to knowledge transfer.

18. Give details of intended participants and any measures to secure participation of researchers from target groups.

19. Give details of any similar proposal (whether funded or not) submitted to an EC programme; if more than one, attach a separate sheet. This should also be done if the present proposal is a resubmission or revised version of a previous one to the HCM or TMR Programmes; it is then advantageous to identify in the main text the modifications introduced. Please do not forget to indicate the official proposal number.

20. Give dates, location, theme, and number of participants of previous, comparable events you have organized.

21. Indicate roles and numbers of staff (in percentages of their work time) to be actively involved in the preparation and organization of the proposed event(s).

22. State names and addresses of other organisations to be involved in preparation and organisation of the events, and specify the