

**CONFIRMING THE INTERNATIONAL ROLE OF  
COMMUNITY RESEARCH**

**Support for centres of excellence**

**(Accompanying Measures, Call identifier: ICFP599A1AM03, June 15, 1999)**

**Computer and Automation Research Institute (SZTAKI),  
Hungarian Academy of Sciences**

**Centre of Excellence in Information  
Technology, Computer Science and Control**

**TECHNICAL ANNEX to the CONTRACT**

based on PART B of the Proposal

**Proposal Title:**

***Technology and Science for the Information Society***

HUN-TING

**TITLE PAGE**

**Proposal Full Title:** Technology and Science for the Information Society

**Proposal Acronym:** HUN-TING

**Proposer:** Computer and Automation Research Institute  
(SZTAKI), Hungarian Academy of Sciences  
Kende u. 13-17. H-1111 Budapest, Hungary  
Tel.: (36 1) 4665-644, Fax: (36 1) 4667-503

**Proposal date:** October 15, 1999

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## B2 OBJECTIVES

The objective of the HUN-TING project is to further integrate the Computer and Automation Research Institute of the Hungarian Academy of Sciences (SZTAKI), Hungary's largest research institute in Computer Science, Information Technology, and Control, into the European network of leading institutions working in this field.

With this proposal, the IT society of HUNGary TINGs at the invisible doors of the EU, to join our common knowledge, technology, and last but not least, our human resources in order to strengthen the European position in the world-wide competition in the key areas of Information Technologies, Computer Science, and Control. Through the networking, twinning activities, virtual laboratories aimed at with this proposal, the critical mass can be achieved, which is required in many research and development areas of this capital and human intensive field.

The expected increase of the Hungarian ICT potential can significantly contribute to the restructuring process in Hungary, not only in the industrial, but also on the social domains. Taking Hungary's geographical position and its historical role into account, the results of this project can radiate into the countries of the region, in conformity with the interest of the Union as a whole.

The Institute has a multidisciplinary approach in its scientific, R&D and educational activities. Our theoretical results and applications traditionally support the Hungarian economy and society. In spite of our limited resources, our scientific achievements are widely known, and the staff members are accepted world-wide as visiting researchers and professors. We work and have leading positions in international organisations, as IEEE, IFAC, IFIP, ERCIM, the W<sup>3</sup> consortium, etc. Our objective is to increase our international role by means of better organised, wider multi- and bi-lateral co-operations with European key research centres and universities through joint research projects, exchange of young and experienced researchers and professors to attain better scientific results, holding joint workshops and conferences.

HUN-TINGS's proposed workplan defined 34 work packages with starting and closing dates, involvement of partners, manmonth efforts, expected results, deliverables and milestones. Later, the thematic Workpackages had been grouped into 12 WPs. Infrastructure WPs support the realisation of the Thematic Workpackages and the networking, twinning, and exploitation/dissemination activities. Integrated Workpackages have been formulated for the exploitation /dissemination tasks, and for the overall project management.

Partly due to the comprehensive nature of our disciplines, and partly due to SZTAKI's wide-scale activities, the Thematic Workpackages (Clusters) formulated in this proposal, relate to 12 Key Actions of the 5<sup>th</sup> Framework Programme of the EU (Fig. B2.1).

The Institute, when operating as a Centre of Excellence,

- will be a favourable workplace for many EU and Hungarian scientists, to work at,
- will increase the international dissemination of the Hungarian results,
- will enable Hungarian scientists to more effectively join EU scientific networks and groups,
- will enable to upgrade thematic virtual laboratories with most recently accessible features, facilities,
- will create more efficient conferences and workshops, will facilitate more researchers to attend international meetings, Workshops, Conferences,
- will provide video-conferencing and multimedia technology facilities for many scientists,
- will create a friendly and fruitful co-operation-targeted atmosphere,
- will help to generate successful proposals based on novel, innovative ideas, and thus
- **will increase the successful participation in many EU FP5 (FP6,...) programs.**

<b>EU 5<sup>th</sup> FWP Key Action No and title</b>		<b>Thematic WP clusters</b>						
<b>No</b>	<b>Title</b>	<b>WPC I</b>	<b>WPC II</b>	<b>WPC III</b>	<b>WPC IV</b>	<b>WPC V</b>	<b>WPC VI</b>	<b>WPC VII</b>
4.	Environment and health	√		√		√		
6.	The ageing population and disabilities	√						
7.	Systems and services for the citizen	√						√
8.	New methods of work and electronic commerce					√		
9.	Multimedia content and tools							√
10.	Essential technologies and infrastructures	√	√	√	√	√	√	√
11.	Innovative products, processes and organisation	√	√	√	√			√
12.	Sustainable mobility and intermodality		√					
13.	Land transport and marine technologies							√
15.	Sustainable management and quality of water						√	
18.	The city of tomorrow and cultural heritage							√
23.	Improving the socio-economic knowledge base			√	√			

Figure B2.1.: Relation of the thematic WP clusters to the Key Actions of the 5<sup>th</sup> Framework Programme

The work is best characterised with the following main consecutive/parallel activities:

1. Detailed planning,
2. Scheduling and resource planning, final plans,
3. Establishing the co-operations, virtual laboratories,
4. Joint work in groups
5. Joint seminars, conferences
6. Mutual short-term and long-term visits, Ph.D. works.
7. Infrastructure/service work packages for distributed digital library, advanced multimedia architecture and video-conference environment upgrading
8. Dissemination and exploitation starts as early as possible by scientific publications, demonstrations, exhibitions, etc.
9. Project management will care for all co-operations, distribute tasks properly, manage task dependencies, keeping the time-tables and solving unexpected problems; keep contact with the project officer, guarantee proper deliverables, etc.

The co-existence of theoretical and applied research, the multi-disciplinary nature of the Institute, and its wide national and international contacts (See Appendices in Part C of the proposal) make SZTAKI an especially flexible, and open organisation. Through the opportunities provided with Centre of Excellence Grant, these features can be of service for the country, the region, and the Union.

## B3 INNOVATION

HUN-TING is in accordance with the objectives of the 5<sup>th</sup> Framework of the EU, since it contributes to

- the *strengthening of the innovative capacity of the European industry* and the fostering of the creation of businesses and services built on emerging technologies and new market opportunities, by
  - increased networking between Centres,
  - increased scope concerning regional coverage, subjects and activities of the Centres,
  - contribution to capacity building through attracting young researchers.
- the *stimulation of European added value* through
  - integrating different academic institutions (universities, research institutes) and industrial firms with complementary competencies from various European regions,
  - reaching the critical mass relating to human and technical sources,
  - enhancing participation in other areas of the 5<sup>th</sup> Framework Programme.
- the support of *European competitiveness* by
  - translating scientific knowledge into innovation,
  - supporting economic and social needs of the region,
  - increased linking with economic and social environment,
  - exploiting and disseminating the gathered knowledge towards other countries in the region, including the SMEs being in fragile starting periods.

### Potential risks and their management

HUN-TING is based mostly on established co-operation of the involved institutions and firms covering different areas of Information Technology, Computer Science, and Control. The members of the Institute are represented in prestigious European Networks, Working Groups and Institutions, such as ICIMS-NOE, IMS, IIMB, DYCOMANS, AMETMAS-NOE, EuriTools, European GRID.

The institute acts as the Regional Centre in Hungary concerning the IT-related activities within the 5<sup>th</sup> Framework Programme.

Also the scientific level of the Institute significantly contributes to the expected success of the Centre. The corresponding data are enumerated in the appendices of Part C of the proposal (indicating the No. of the appendices):

- 10.1 Memberships in scientific boards and committees
- 10.2 International projects from the past years
- 10.3 List of foreign Ph.D. students at SZTAKI in the past years
- 10.4 List of longer research periods of staff members abroad
- 10.5 International scientific events organised by SZTAKI (1991 – 2001)
- 10.6 Some of the visitors of the past years
- 10.7 Letters of Recommendation

The well-established combination of theoretical and applied research activities of the Institute, the qualification and age distribution of the staff all contribute to the minimisation of the potential risks of the Project.

The Work Packages formulated comply with the main directions of the Institute, further decreasing the risk potential.

SZTAKI enjoys a well-established central position within the circle of Hungarian Research Institutes / Universities. Through its full professors and leading scientists taking part at the higher education, including the External University Departments of the Institute, and through its versatile industrial / governmental contacts, the exploitation and dissemination of the results are guaranteed with no or limited risk.

## B4 WORK-PLAN

### Introduction

The technical and scientific Work Packages (WPs) described in the proposal had been integrated and merged to decrease their number from 34 to 12. They are of *three categories*:

- Exploitation & dissemination , Project management, co-ordination, clustering with networks (WP1)
- Infrastructure, multimedia, video-conferencing (WP2)
- Thematic WP Clusters (WPCs) (WP3 – WP12) which represent the main research directions of the Institute, such as:
  - Analogical and Neural Systems (WP3)
  - Meta Computing (WP4)
  - Language Theory, multiagent systems (WP5)
  - Symbolic computation, financial math. (WP6)
  - Virtual Lab for IMS, (WP7)
  - Virtual Lab for extended and virtual enterprise, PLANET (WP8)
  - Group decision Support Systems, mathematical physics (WP9)
  - Distributed digital library, networking (WP10)
  - IS Technology, BPR and SW quality improvement (WP11)
  - Intelligent road vehicle systems virtual lab for vision in the loop (WP12)

HUN-TING's workplan structure has been designed to match the main objectives of the proposal, and the diversity of the Institute's activity in the field of Information Technologies, Computer Science and Control. Figure B4.1 represents the structure of HUN-TING Work Packages.

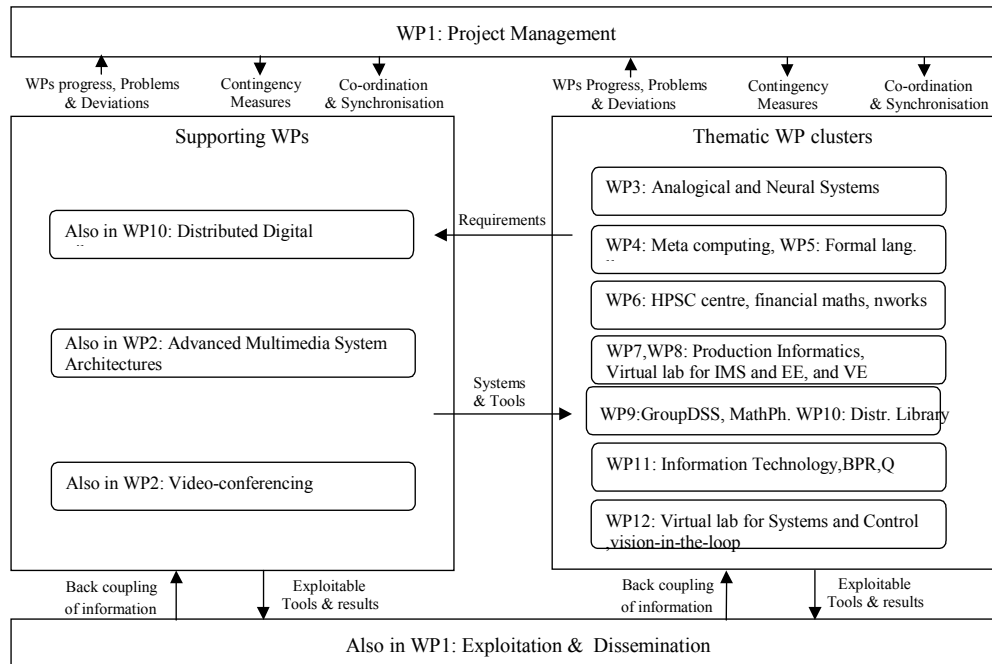


Figure B4.1: Structure of HUN-TING Workplan by Work Packages



The technical-scientific WP categories in HUN-TING are as follows:

### **Exploitation & Dissemination, Project Management**

Throughout the time frame of HUN-TING, the *Project Management Staff* prepares and refines its strategy related to diffusion and commercial exploitation of the information and results of activities, such as potential market analysis, identification of dissemination and distribution channels, industrialisation plans. These objectives are accomplished also in WP 1.

Project management is to organise the Centre of Excellence activities as a whole, direct SZTAKI Laboratories according to the workplan and strategy, interact with all partners and the Commission, monitor and account project activities, do risk assessment and contingency management, and project infrastructure maintenance. These activities will be carried out in WP1.

### **Thematic WP Clusters**

The project main body consists of WP clusters representing the main R&D directions of the Institute related to the objectives of the Centre of Excellence. Each WPC includes the description of the activity aimed at in the given WPC (usually with type of activity CO), followed by WPs, which constitute supplementary activities such as visits, or conference organisations.

### **Supporting WPs**

The realisation of the activities given in the Thematic WP Clusters is supported by enabling measures, such as establishment of video-conferencing facilities, higher level computer network services, database maintenance, digital library, and multimedia preparation facilities, etc.

Interrelations between the Thematic Clusters and the Supporting WPs are managed by the *Project Management Staff*, which has the primary objective of ensuring proper co-ordination between teams working in each different area.

As a result, it is expected that SZTAKI will be a recognised member of the European Network of Institutions working in the field of Information Technologies, Computer Science and Control. The grant of Centre of Excellence constitutes an indispensable mental and material support, the influence of which is hard to be overestimated. At the end of the three-year period, SZTAKI will be an Institute with well established connections to the high-edge Research Centres in the EU with a significant radiation towards the economic and social environment within Hungary and in the surrounding region, supporting the needs arising. And last but not least, an enhanced participation of the Institute and industrial partners, including SMEs in other areas of the 5<sup>th</sup> Framework Programme is expected, with a long-term sustainable effect on the development of the Centre.

The relation of the thematic WP clusters to the Key Actions of the 5<sup>th</sup> Framework Programme was previously illustrated in Figure B2.1.

During the Contract negotiation phase, the 12 technically and scientifically clustered Workpackages horizontally had been restructured, to enable verification and confirmation of the progress throughout the project time-frame.

In the following tables and in the consecutive paragraphs, the set of horizontal Workpackages A,B,C,D and E are detailed, while reference to these are made within the WP1-12 by giving the activity type of V1,V2,V3,V4, VR,WS,CF,CO,networking, twinning, other.

The horizontal (administrative) workpackages are as follows:

<b>B4.1 The Measures: Work package list</b>						
<b>WP No.<sup>1</sup></b>	<b>Work package title</b>	<b>Type of activity<sup>2</sup></b>	<b>EU contribution requested<sup>3</sup></b>	<b>Start month<sup>4</sup></b>	<b>End month<sup>5</sup></b>	<b>Deliverables<sup>6</sup></b>
WPA	Project management & co-ordination,	CO, other	<b>78700</b>	0	36	D.A.x
WPB	Exploitation and dissemination, twinning, advanced multimedia system architectures and educational and training courseware applications for infrastructure, adoption of video-conferencing infrastructure to support enhanced co-operation means	CO, other	<b>12000</b>	0	36	D.B.x
WPC	Foreign visitors at SZTAKI, virtual laboratories	V1,V2, V3,V4, other	<b>420800</b>	0	36	D.C.x
WPD	Organising Workshops, Conferences and scientific meetings	CO, CF, WS, other	<b>27700</b>	0	36	D.D.x
WPE	Visits to another research Centre	VR, other	<b>60800</b>	0	36	D.E.x
	<b>TOTAL</b>		<b>600000</b>			

<sup>1</sup> Work package number WP-A – WP-E

<sup>2</sup> use the following description:

senior visitor: V1, Workshop: WS,  
junior visitor: V2, Conference: CF,  
post doc: V3, Twinning, networking, co-ordination: CO,  
Ph.D. student: V4, Visit to another research Centre: VR

<sup>3</sup> The requested EU contribution cost allocated for the work package, the break down of these costs has to be introduced in form B4.2,

<sup>4</sup> Start date of work in this specific work package, month 0 being the start of the overall package of measures and all single work packages start at dates being relative to this.

<sup>5</sup> End date from the start of the overall package of measures

<sup>6</sup> D.A.x.–D.E.x.: Number for deliverables/results as mentioned in the work package description for WP-A, WP-B, ..., WP-E.

Workpackage No	Workpackage Short Name	Duration	Number of person/months	Personnel Costs	Durable Equipment	Consumables	Travel and Subistence	Computing	Subcontracting	Subtotal part I/2
WPA	Project management, co-ordination	36	12	27700	51000					78700
WPB	Exploitation and dissemination, twinning, advanced multimedia system ...	36	5	12000						12000
WPC	Foreign visitors at SZTAKI, virtual laboratories	36	68	232800						232800
WPD	Organising Workshops, Conferences and scientific meetings	36	12	27700						27700
WPE	Visits to another research Centre	36	-	-			60800			60800
<b>GRAND-TOTAL</b>				<b>97</b>	<b>300200</b>	<b>51000</b>	<b>60800</b>			<b>412000</b>

B4.2 Cost Summary<sup>1</sup> in euro (part 1/2)

Workpackage No	Workpackage Short Name	Duration	Subtotal of part 1/2	Other Specific project Costs	Protection of Knowledge	Overhead Costs	Total Costs	% Requested from the Community	Requested Contribution from the Community
WPA	Project management, co-ordination	36	78700				78700	100	78700
WPB	Exploitation and dissemination, twinning, advanced multimedia system ...	36	12000				12000	100	12000
WPC	Foreign visitors at SZTAKI, virtual laboratories	36	232800			188000	420800	100	420800
WPD	Organising Workshops, Conferences and scientific meetings	36	27700				27700	100	27700
WPE	Visits to another research Centre	36	60800				60800	100	60800
<b>TOTAL</b>			<b>412000</b>			<b>188000</b>	<b>600000</b>	<b>100</b>	<b>600000</b>

B4.2 Cost Summary <sup>1</sup> in euro (part 2/2)

The following set of WORKPACKAGES A+B+C+D+E reflect the types of key activity classes within the Centre-of-Excellence concept. The theoretical and scientific description of the various research topics are discussed in the Annex, under the originally planned 34 Workpackages, which were later clustered into 12 multiple Workpackages.

B4.3

**Work package description****Work package number and title: WP-A***Project Management & co-ordination,***Type of activity : CO, other****Relative start month<sup>1</sup>: 0****Timetable: months 0 - 36****Objectives:**

To direct and co-ordinate all activities, balancing objectives and strategic directions, managing risks, and overcoming constraints to successfully meet the goals of the Centre. These goals are: increased networking between Centres; increased scope in respect to regional coverage, subjects, and activities; attraction of young researchers; support for economic and social needs of the region; increased linkage with economic and social environment; and enhanced participation in other areas of the 5<sup>th</sup> FWP. To define and realise measures which contribute to the success of the Centre.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

The work will consist of the following activities:

- *Implementing and managing* the Project Management structure, defining the boards.
- *Project co-ordination*, that means the overall direction and formal administration of the project, including interaction with the partners and the EC, preparation of reports and formal documents by the management team, meetings scheduling and organisation, circulation of official documents inside and outside the Centre.
- *Project monitoring and contingency management*: that means Workpackages progress assessment, monitoring of resources and milestones, Workplan evaluation and revision and contingency checking.
- *Co-ordination of project infrastructure set-up and maintenance*.

**Deliverables:**

Official project reports: Periodic Progress Reports, and Final Report, as specified in the Accompanying Measures programme contract and the related Annexes. The physical results from the Project Management activities are represented in the above listed reports. Other tangible results are the documentation of project meetings (agenda, minutes, and presentations).

D.A.1.: Increased networking among centres,

D.A.2.: Enhanced participation of the Centre in other areas of the 5<sup>th</sup> Framework Program

D A.3.: Periodic Progress Report, +12 months

D A.4.: Periodic Progress Report, +24 months

D A.5.: Periodic Progress Report, +36 months

D A.6.: Final Report, +36 months

**B4.3 Work package description****Work package number and title: WP B*****Exploitation and dissemination, twinning, advanced multimedia system architectures and educational and training courseware applications for infrastructure, adoption of video-conferencing infrastructure to support enhanced co-operation means***

**Type of activity: other: technology pilot implementation, dissemination+exploitation support measure, other: demonstrations, exhibitions, etc.**

**Relative start month: 0**

**Timetable: months 0-36**

**Objectives:**

The educational multimedia courseware is an important application in the European Programmes. The advances in interactive simulations and virtual learning environments led to a new generation of educational applications based on multimedia tools.

The main objective of this WP is to help and accelerate our joining the network of the leading European institutions in this field. The activities in the WP are oriented towards experimentation of distributed teaching and learning facilities for co-operation between institutions. This will allow them to share teachers and students on all the possible levels as well as resources (e.g. courses, laboratories, etc.) and to apply common solutions for generic distributed learning services.

Video-conferencing is by now a well-known technology used also by the Commission and by many research facilities, but industrial entities are also catching up fast with this technique.

The objective is to accelerate our capability to use video-conferencing tools in our co-operation activities to spare travel-time, and spare resources. Our presently available pilot video-conferencing facilities need a harmonised upgrade to match the present and future needs. The upgraded environment will also allow tests to be performed for Community declared key actions, such as investigating tele-work, distance learning, virtual enterprise functions.

Additional objectives are to identify distribution policies and channels, planning and implementation of dissemination and exploitation actions throughout the project; technology transfer for SMEs.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

Maintaining and strengthening our existing contacts and building new ones with leading European research centres via increased multimedia and in video-conferencing means by:

- organizing training events and seminars,
- exchanging educational and training materials,
- developing new educational materials,
- establishing pilot virtual laboratories and common multimedia repositories,
- extending network activities,
- finally, to set up an infrastructure pilot implementation of multimedia course-ware and for video-conferencing facility.

The output for most workpackages in our proposal could take the advantage of using this advanced infrastructure service, gaining experience and disseminating our test results.

- Dissemination actions to be undertaken from the project beginning,
- Presentation of the results at conferences, workshops and in scientific journals.
- Set-up and maintenance of the project public web site,
- Organisation of Bridge-Conferences between East and West in the fields of the activities of the Centre, i.e. Technology and Science for the Information Society.
- Establishment and maintenance of a repository of Ph.D. works, activities, conferences, networks
- Presentation of the results for SMEs, technology transfer

**Deliverables:**

- D B.1: Requirement analysis for a pilot implementation
- D B.2: Detailed plans, Preliminary exploitation and dissemination plans
- D B.3: Report on implementation and exploitation and dissemination, statistics
- D.B.4.: Contribution to capacity building through attracting young researchers
- D.B.5.: Increased linkage with economic and social environment
- D.B.6.: Enhanced participation of the Centre in other areas of the 5th Framework Program

**B4.3****Work package description****Work package number and title: WP-C***Foreign visitors at SZTAKI, virtual laboratories***Type of activity :** V1,V2,V3,V4, other**Relative start month<sup>1</sup>:** 0**Timetable:** months 0 - 36**Objectives:**

To gain internationally respected experts to carry out specific research work and management of research activities, by devoting significant time and effort at SZTAKI.

The result of their undertaken work will directly influence the local expert teams, will help young researchers to get highly motivated for their carrier, will influence the local research community and related industrial partnership to drive for increased participation in all areas of the 5<sup>th</sup> FWP.

By the establishment of virtual laboratories, the twinning and co-operation among other research sites will also enable increased efficiency of international joint research actions.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

The work will consist of the following activities:

- *Identifying the currently open fields for international experts to work at SZTAKI,*
- *Inviting targeted key experts using SZTAKI's broad international relations for the positions available.*
- *Selection of candidates,*
- *Defining together the workplan for each visitor,*
- *Arrangements for the long-term and short-term visits,*
- *Defining the exploitation, dissemination plans,*
- *Establishment and maintenance of a repository of results*
- *Evaluation of each visit*

**Deliverables:**

Each Progress Report will include the details of the selection process, the detailed workplan for the visitors, the visitors' report, and the evaluation.

D.C.1.: Increased networking among centres,

D.C.2.: Increased scope of the Centre,

D.C.3.: Enhanced participation of the Centre in other areas of the 5<sup>th</sup> Framework Program

D C.4.: Periodic Progress Report, +12 months

D C.5.: Periodic Progress Report, +24 months

D C.6.: Periodic Progress Report, +36 months

D C.7.: Final Report, statistics, +36 months



**B4.3 Work package description****Work package number and title: WP D*****Organising Workshops, Conferences and scientific meetings*****Type of activity: WS, CF, twinning, networking, other, like demonstrations, exhibitions, technology pilot implementation, dissemination+exploitation support measures,****Relative start month: 0****Timetable: months 0-36****Objectives:**

The driving force for this workpackage is to enable a widespread dissemination for ideas, theories, methods and technologies among experts of devoted research fields, to give opportunities for foreign scientists and experts to see and hear other colleagues from the same field. The face-to-face meetings are just as important as the remote or tele-conferencing, and each conferencing method has its own importance and benefits compared to the others. Workshops, with limited number of attendees can inspire more effective debates and discussions, while Conferences and Congresses attract attendees from a wider base. Exhibitions, open days, tutorials, SME-targeted technology-transfer and technology-demonstration days, etc. are also planned under this workpackage

**Description of the contents, the workplan, the steps, the approach or the methodology:**

- Developing a detailed plan for the management of the events,
- Selection of dates and topics for the events,
- Development of the WEB site of the event and the database for the contributions,
- Invitation and selection of the international and national program committees,
- Selection of the referees, preparation for the Preprints, Proceedings – Data-bases/CDs,etc,
- Management of the events,
- Evaluation of the events,
- Planning and managing the publications,
- Applying multimedia and video-conferencing techniques,

**Deliverables:**

- D.D.1.: Increased networking among Centres
- D.D.2.: Increased scope of the Centre
- D.D.3.: Contribution to capacity building through attracting young researchers
- D.D.4.: Support for economic and social needs of the region
- D.D.5.: Increased linkage with economic and social environment
- D.D.6.: Enhanced participation of the Centre in other areas of the 5th Framework Programme
- D D.6: Evaluation report on each event
- D D.7: Final report on implementation, statistics

B4.3

**Work package description****Work package number and title: WP-E***Visits to another research Centre***Type of activity : VR, other****Relative start month<sup>1</sup>: 0****Timetable: months 0 - 36****Objectives:**

To learn, to gain experiences and increase the co-operation efficiency among European research sites, the mobility of local experts are also needed. Long-term visits to other research centres are planned, and active participation at international conferences, workshops, working group meetings are indeed, treated as fundamental steps to reach effective co-operation with other European research groups.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

The work will consist of the following activities:

- *Selection of local experts, those, who ought to participate at foreign events or stay at foreign laboratories,*
- *Selection of those international laboratory sites, that are ready to host Hungarian experts of a given research filed,*
- *Matching the requirements with the opportunities,*
- *Management of the visits,*
- *Developing a detailed plan, workplan, exploitation plan,*
- *Reporting on the long or short-term visit*
- *Evaluation of the visit.*

**Deliverables:**

Each report will detail the visitor's progress, with the plan, the report and the evaluation.

D.E.1.: Increased networking among Centres

D.E.2.: Increased scope of the Centre

D.E.3.: Contribution to capacity building through attracting young researchers

D.E.4.: Increased linkage with economic and social environment

D.E.5.: Enhanced participation of the Centre in other areas of the 5<sup>th</sup> Framework Programme

D E.6.: Periodic Progress Report, +12 months

D E.7.: Periodic Progress Report, +24 months

D E.8.: Periodic Progress Report, +36 months

D E.9.: Final Report, statistics+36 months

As a reference, we do keep the thematic, technically and scientifically clustered planned WPs (WP1-to WP34/12) in the Technical annex of the contract as Appendix.

As a summary, please refer to the following table:

<b>B4.1 The Measures: Work package list</b>						
<b>WP No.<sup>1</sup></b>	<b>Work package title</b>	<b>Type of activity<sup>2</sup></b>	<b>EU contribution requested<sup>3</sup></b>	<b>Start month<sup>4</sup></b>	<b>End month<sup>5</sup></b>	<b>Deliverables<sup>6</sup></b>
WP1	Exploitation and dissemination, Project management & co-ordination,	CO, VR		0	36	D 1.x
WP2	Infrastructure, multimedia, video-conferencing	CO, CF		0	36	D 2.x
WP3	Analogic CNN theory	CO,V1,4		0	36	D 3.x
WP4	Supercomputing centre and corresponding workshops, conferences, visits	CO, CF, WS,CF, V1,demo		0	36	D 4.x
WP5	Formal language, agent-based computing	V1,CF, WS,VR		0	36	D 5.x
WP6	HPSC resource centre, financial math., networking, Conference, WS	CO, CF, WS,VR, V1,3,4		0	36	D 6.x
WP7	Virtual lab for IMS, networks, conferences	V1,CO, CF VR, WS		0	36	D 7.x
WP8	Virtual lab for EE,VE, PLANET networking, visits	CO,V1 WS,CF, VR		0	36	D 8.x
WP9	Group Decision Support System, Math. Phys.	CO, VR, V1		0	36	D 9.x
WP10	Distributed digital library	CO, V1,other		0	36	D 10.x
WP11	IS Techn., BPR and SW quality improvement	CO, VR, WS		0	36	D 11.x
WP12	Lab. for intelligent road vehicle systems, control with vision-in-the-loop.	CO, CF, VR V1		0	36	D 12.x
	<b>TOTAL</b>		<b>600000</b> (1082581)			

<sup>1</sup> Work package number WP1 – WP n

<sup>2</sup> use the following description:

senior visitor: V1, Workshop: WS,  
junior visitor: V2, Conference: CF,  
post doc: V3, Twinning, networking, co-ordination: CO,  
Ph.D. student: V4, Visit to another research Centre: VR

<sup>3</sup> The requested EU contribution cost allocated for the work package, the break down of these costs has to be introduced in form B4.2,

<sup>4</sup> Start date of work in this specific work package, month 0 being the start of the overall package of measures and all single work packages start at dates being relative to this.

<sup>5</sup> End date from the start of the overall package of measures

<sup>6</sup> D1-Dn: Number for deliverables/results as mentioned in the work package description

B4.3

**Work package description****Work package number and title: WP1***Exploitation and dissemination, travels, workshops, conferences,  
Project Management & co-ordination,***Type of activity : CO, other****Relative start month<sup>1</sup>: 0****Timetable: months 0 - 36****Description of the contents, the workplan, the steps, the approach or the methodology:**

The work will consist of the following activities:

*Project co-ordination*, that means the overall direction and formal administration of the project, including interaction with the partners and the EC, preparation of reports and formal documents by the management team, meetings scheduling and organisation, circulation of official documents inside and outside the Centre.*Project monitoring and contingency management*: that means Workpackages progress assessment, monitoring of resources and milestones, Workplan evaluation and revision and contingency checking.*Co-ordination of project infrastructure set-up and maintenance.**Dissemination actions* to be undertaken from the project beginning, include:

Presentation of the results at conferences, workshops and in scientific journals.

Set-up and maintenance of the project public web site,

Organisation of Bridge-Conferences between East and West in the fields of the activities of the Centre, i.e. Technology and Science for the Information Society.

Establishment and maintenance of a repository of Ph.D. works, activities, conferences, networks

Presentation of the results for SMEs, technology transfer.

As a member of ERCIM, SZTAKI experts are to take more active participation within the ERCIM Working groups. Hopefully several ERCIM WGs will benefit from our participation, and new projects will emerge from those scientific seeds.

**Deliverables, expected results, milestone for the overall package:**

Official project reports: Periodic Progress Reports, and Final Report, as specified in the Accompanying Measures programme contract and the related Annexes. The physical results from the Project Management activities are represented in the above listed reports. Other tangible results are the documentation of project meetings (agenda, minutes, and presentations) , ERCIM joint results, joint projects and joint proposals.

Effectiveness of Project Management can be measured at each Milestone in terms of:

Performance of the Centre of Excellence in delivering the expected results in time, in proper quality, and employing the planned amount of resources.

Homogeneity of results and degree of co-operation between the thematic WPCs

Effectiveness of the contingency management in the case of exceptions and problems.

Preliminary exploitation and dissemination plans.

The dissemination activities themselves are not directed to release specific Deliverables, but will produce tangible results from the first project quarter, in terms of publications, presentations, web site contents and repositories, which will be summarised as yearly Deliverables.

**Deliverables:**

- D 1.1.: Periodic Progress Report, +12 months  
Preliminary exploitation and dissemination plans
- D 1.2.: Periodic Progress Report, +24 months  
Report on exploitation and dissemination
- D 1.3.: Periodic Progress Report, +36 months  
Report on exploitation and dissemination
- D 1.4.: Final Report, +36 months

1

Month 0 being the start of the project

**B4.3 Work package description****Work package number and title: WP 2*****Advanced multimedia system architectures and educational and training courseware applications for infrastructure, adoption of video-conferencing infrastructure to support enhanced co-operation means*****Type of activity: CO, other: technology pilot implementation, dissemination+exploitation support measure, demonstration, V4,VR****Relative start month: 0****Timetable: months 0-36****Objectives:**

The educational multimedia courseware is an important application in the European Programmes. The advances in interactive simulations and virtual learning environments led to a new generation of educational applications based on multimedia tools.

The main objective of this WP is to help and accelerate our joining the network of the leading European institutions in the field. The activities in the WP are oriented towards experimentation of distributed teaching and learning facilities for cooperation between institutions. This will allow them to share teachers and students on all the possible levels as well as resources (e.g. courses, laboratories, etc.) and to apply common solutions for generic distributed learning services.

Video-conferencing is by now a well-known technology used also by the Commission and by many research facilities, but industrial entities are also catching up fast with this technique.

The objective is to accelerate our capability to use video-conferencing tools in our cooperation activities to spare travel-time, and spare resources. Our presently available pilot video-conferencing facilities need a harmonized upgrade to match the present and future needs. The upgraded environment will also allow tests to be performed for Community declared key actions, such as investigating tele-work, distance learning, virtual enterprise functions.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

Maintaining and strengthening our existing contacts and building new ones with leading European research centres in multimedia and in video-conferencing by:

- organizing training events and seminars,
- exchanging educational and training materials,
- developing new educational materials,
- establishing pilot virtual laboratories and common multimedia repositories,
- extended network activities,
- finally, to set up an infrastructure pilot implementation of multimedia course-ware and for video-conferencing facility.

The output for most workpackages in our proposal could take the advantage of using this advanced infrastructure service, gaining experience and disseminating our test results.

**Partners involved:**

Technical University of Crete, Greece; Maison Des Sciences De L'Homme, Paris, France; Institute of Mathematics and Informatics Bulgarian Academy of Sciences, Sofia, Bulgaria; Centro de Computacac Grafica, Coimbra, Portugal; University of Graz, Austria; INRIA, Paris, France; National University of Athens, Greece; University of Stuttgart, Germany, University of Vienna, Austria; Barcelona University UPC, Spain; ELTE University of Sciences, Budapest, Hungary; KLTE University, Debrecen, Hungary  
Ph.D. students from national and international sources will be involved.

**Deliverables, expected results:**

**B4.3****Work package description****Work package number and title: WP 3***Analogic CNN (Cellular Neural Network) theory, algorithms and their application in medical diagnosis***Type of activity : CO, V1-4, WS****Relative start month<sup>1</sup>: 0****Timetable: months 0-36****Objectives:**

The Cellular Neural/Nonlinear Network (CNN) paradigm was founded in 1988 by L.O. Chua in Berkeley. Based on this paradigm, the CNN Universal Machine (CNN-UM) architecture, invented in 1992 by our Institute's senior scientist, Acad.T. Roska and L.O. Chua, is a novel spatio-temporal array computer. It is also termed *analogic* CNN computer because analog spatio-temporal dynamics is combined with logic operations, embedded in a stored programmable framework. The enormous computing power (several Tera equivalent floating point operation/second/cm<sup>2</sup>) of the first experimental chips (made in Berkeley and Seville), using standard CMOS fabrication technology, is the consequence of an entirely new processing method. The cellular grid-like structure and the mainly local interconnection topology are not only resembling the anatomy of the retina and the visual system, but they are very close to the operation of the eye, especially when photosensors are placed over each tiny analogic processor. Several thousands of these tiny processors (or cells) can be placed on a chip, which is also called a *visual microprocessor* or *cellular analogic processor*.

In Europe our Institute plays the key role in this field. Leading the joint activity of interdisciplinary institutions is a challenging task that we are pleased to undertake.

The effects of our work would be a world-wide push to the benefit of many application areas. This project is directed to work on new types of spatio-temporal algorithms and apply them in several medical fields. Test cases for applications are foreseen in the field of medical diagnosis based on two dimensional images.

**Description of the contents, the workplan, the steps, the approach or the methodology:***(1) Joint activity on non-equilibrium spatio-temporal algorithms*

National and international experts will investigate new algorithms embedding wave-like phenomena. Active contour detection on echocardiographic images will be evaluated with potential end-users at S. Francis Hospital, Budapest (Prof. A. Tahy). Feature extraction from these images is of great importance both for qualitative and quantitative analysis of the heart function. Results will be verified and disseminated.

*(2) Further development of the Analogic Mammogram Diagnostics Workstation*

We have been working in this field for 3 years with several foreign partners, in cooperation with the Mammogram Screening Centre at the National Institute of Oncology in Budapest (Prof. Gy. Liszka). Last year we made a major upgrade in our Analogic Mammogram Diagnostics Workstation (AMDW) and installed it at that centre for clinical use. The first experimental results and statistical tests we have recently completed are really encouraging. Based on the test results algorithms will be refined.

*(3) Development of typical morphology and motion related diagnostic algorithm base*

Based on the experience in the above two projects, typical analogic cellular algorithms will be developed for morphology classification and motion related image enhancement. These algorithms can be used for other medical imaging and diagnostics.

Ph.D. students will be involved in all work-package items.

**Partners involved**

National Institute of Oncology in Budapest  
S. Francis Hospital, Budapest (Prof. A. Tahy),  
IMSE- Centro Nacional de Microelectronica- Universidad de Sevilla ( Prof. A. Rodriguez- Vazquez),  
Katholieke Univ. Leuven, (Prof. J. Vandewalle)  
Pázmány Peter Catholic University, Budapest

**Deliverables, expected results, milestone for the overall package:**

Papers containing new analogic spatio-temporal algorithms.  
The evaluation of the proposed CNN based diagnostic workstation providing fast, reliable filtering and feature extraction. The proposed methods help doctors to make correct diagnosis.  
Organising a workshop on analogic CNN computing technology.  
Developing teaching materials, multimedia materials and organise video-conferencing to show the capabilities of this new type of computing.



**B4.3 Work package description****Work package number and title: WP 4***Supercomputing centre and corresponding workshops, conferences, mutual visits***Type of activity : WS, CF, V1, CO, demonstrations****Relative start month<sup>1</sup>: 0****Timetable: months 0-34****Objectives:**

Our Institute had decided to establish a supercomputing centre one that could facilitate new emerging technologies such as cluster computing, metacomputing and GRID computing.

The aim of the centre is to provide nation-wide knowledge, research, education and industrial service in the field of supercomputing. Beyond the national services, our staff will conduct research on cluster programming and metacomputing particularly in the field of supporting tools and environment where they have long running experience based on previous COPERNICUS and ESPRIT projects. Another important research area will be the application of these new infrastructures in the field of environment and health, economic and efficient energy as well as in sciences like biotechnology, chemistry, physics, economy and transport.

Our Institute has been successfully organising the Austrian-Hungarian workshops on Distributed and Parallel Systems (DAPSYS) since 1996 in every second year. The 3<sup>rd</sup> workshop (DAPSYS'2000) will be held in Balatonfüred and co-organised with the 7<sup>th</sup> EuroPVM/MPI conference. Participants of the two events will share invited talks, tutorials and social events while contributed paper presentations will go on in separate tracks in parallel.

Meanwhile EuroPVM/MPI is dedicated to the latest developments of PVM and MPI, DAPSYS is expected to be a major event to discuss the general aspects of distributed and parallel systems. In this way, the two events are complements to each other and participants of DAPSYS'2000 workshop can benefit from the joint organization of the two events. This joint event will be the greatest event in Hungary to disseminate the results of supercomputing, cluster computing and metacomputing.

We plan to organise the 7<sup>th</sup> EuroPVM/MPI conference at Lake Balaton together with DAPSYS'2000. This joint event will be the greatest event in Hungary to disseminate the results of supercomputing, cluster computing and metacomputing.

In 2002 we would like to further increase the attraction of European and American scientists to Hungary and plan to combine DAPSYS'2002 with the CERN led DataGrid project.

There is a European GRID Forum under preparation and we are acting as funding members of the consortium. The aim of this network is to promote metacomputing and GRID computing in Europe based on recent research results and experiences. The other goal of the consortium is to initiate European collaborative research projects in this new field.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

The detailed workplan for organizing EuroPVM/MPI is as follows:

Setting up the Programme Committee: November, 1999

First Call for Papers: December, 1999

Final Date for Submissions: 31<sup>st</sup> March, 2000

Notification of Acceptance: 1<sup>st</sup> May, 2000

Final Copy and Author registration: 1<sup>st</sup> June, 2000

**Description of the contents, the workplan, the steps, the approach or the methodology:**

The key elements of the workplan are to create a supercomputing centre based on a 29-node beowulf cluster at the SZTAKI. This centre will provide technology transfer in three aspects:

Supercomputing knowledge transfer from the leading centres of the European Union and from the U.S. to Hungary.

Supercomputing technology transfer from the academic world to the Hungarian industry.

To conduct IT and interdisciplinary research for the further development and applications of cluster computing and metacomputing.

In accordance with the first aspect of technology transfer, we would like to participate in existing European networks of excellence and to contribute to the creation of new networks. Accordingly, we are already associated members in the EuroTools consortium which was established in the 4<sup>th</sup> Framework Programme with the aim of disseminating the knowledge of supercomputing programming tools and environments. From among the CEE countries, our Institute is the only one participating in this network.

There is a European Grid Forum under preparation and we are acting as funding members of the consortium. The aim of this network is to promote metacomputing and GRID computing in Europe, based on recent research results and experiences. The other goal of the consortium is to initiate European collaborative research projects in this new field. The head of the centre, Prof. Peter Kacsuk will act as the leader of the work package Performance Analysis in the European Grid Forum.

As for the technology transfer role of our supercomputing centre, we would like to collaborate with several universities, national institutes and industrial companies in the field of environment and health, economy and efficient energy as well as sciences such as biotechnology, chemistry, physics, economy and transport. We plan collaborative projects with the Hungarian Weather Forecast Service, Paks Nuclear Power Plant and some other companies. We shall disseminate basic knowledge of adapting, writing and maintaining parallel software systems as well as giving courses to industrialists on parallel programming, cluster computing and metacomputing.

The SZTAKI has a strong background in designing, installing and maintaining networking services for the institutes of the Hungarian Academy of Sciences and for the Hungarian universities. In the field of metacomputing we are going to rely on this background and to combine it with the clustering technology to be explored during the current project. We plan to establish a Hungarian metacomputing system testbed by interconnecting two main institutions: the SZTAKI and the Technical Univ. of Budapest. Such a testbed will help us to gain experience and compare them with the results of European metacomputing testbed systems.

As to the research aspects of cluster computing and metacomputing, we recognized that the lack of suitable tools and programming environments is a serious obstacle of the wide-spread usage of supercomputing systems. We will conduct research on the theoretical background and practical development of graphical tools and environments for maintaining and controlling supercomputer systems, as well as for designing and debugging parallel and distributed programs.

Detailed workplan for DAPSYS'2000:

We have already signed the contract with Kluwer Academic Publishers for DAPSYS'2000 and distributed the First Announcement on the workshop.

The Call for Papers were distributed in November 1999.

Submission deadline was: 15. February, 2000

Notification of acceptance: 31. March, 2000

Papers in camera ready form: 30. April, 2000

Camera ready proceedings to Kluwer: 15. May, 2000

Workshop: 10-13. September, 2000

Composing special issue into the New Generation Computing journal: November, 2000

The detailed workplan of DAPSYS'2002 will follow a scheme similar to DAPSYS'2000

The detailed workplan for organizing EuroPVM/MPI is as follows:

Setting up the Programme Committee: November, 1999

First Call for Papers: December, 1999

Final Date for Submissions: 31<sup>st</sup> March, 2000

Notification of Acceptance: 1<sup>st</sup> May, 2000

Final Copy and Author registration: 1<sup>st</sup> June, 2000

For the European GRID network we would like to invite:  
 Dr. Domenico Laforenza and Carl Kesselman in order to give a short course on metacomputing, we would like to visit:  
 Univ. of Bergen to give a seminar talk on metacomputing tools and environments  
 Univ. of Stuttgart to get information and experience on the German Metacomputing testbed  
 Univ. of Padernborn to exchange ideas on metacomputing tools and environments  
 Participation in the European Grid Forum workshops:  
 2000, Berlin  
 2001, Lecce  
 2002, the location is not specified yet.

#### **Partners involved**

From the EU countries the following partners are envisaged to have a stronger collaboration during the current project:  
 Technical Univ. of Munich (Prof. Arnt Bode), Genias GmbH (Prof. Wolfgang Gentsch), Univ. of Southampton (Dr. Barbara Chapman), Univ. of Westminster (Prof. Stephen Winter, Dr. Vladimir Getov), Vienna Centre for Parallel Computing (Dr. Willy Weiss), Barcelona Supercomputing Centre (Prof. Mateo Valero), Univ. of Amsterdam (Prof. Bob Hertzberger), CNUCE, Pisa, Italy (Dr. Domenico Laforenza), Stuttgart Supercomputing Centre (Dr. Michael Resch), Univ. of Bergen (Prof. Tor Soverik), University of Lecce, ...  
 Expected Hungarian partners: Univ. of Miskolc, Technical Univ. of Budapest, Loránt Eötvös Univ. of Sciences, Budapest, Paks Nuclear Power Plant, Hungarian Weather Forecast Service, Hungarian Geophysical Service, Ikarus Holding, Raba Holding, Silicon Graphics Hungary Ltd., ASK Ltd.

#### **Deliverables, expected results, milestone for the overall package:**

D 4.1: Operational version of the 29-node beowulf cluster, +6 months  
 D 4.2: Graphical programming environment for the beowulf cluster, +12 months  
     Proceedings of the 7<sup>th</sup> EuroPVM/MPI Conference  
     Proceedings of the 3<sup>rd</sup> Austrian-Hungarian WS on Distributed and Parallel Systems  
 D 4.3: Specification study of the Hungarian metacomputing testbed, +18 months  
     Special issue in the New Generation Computing Journal  
 D 4.4: Operational version of the Hungarian metacomputing testbed, +36 months  
     Proceedings of the DAPSYS'2002

**B4.3 Work package description****Work package number and title: WP5*****Promoting the development of a research network in modelling multi-agent systems*****Type of activity : CO , WS, VR, V1, V3, V4****Relative start month<sup>1</sup>: 0****Timetable:months 0-36**

**Objectives:** Our aim is to promote joint research and knowledge dissemination in the field of Grammar Systems, an active recognised area of formal language theory, which provides formal models for multi-agent systems. Grammar Systems theory is cultivated by researchers of an informal research network with members from 10 European countries where 4 countries are in the phase of pre-accession (Hungary, The Czech Republic, Slovakia, Romania). Achievements and results of the above network could promote the development of computer science, especially the theoretical foundations of technological fields, dealing with information dissemination, co-operation, and preservation of the state of the environment. At the same time we are also interested in agent-based computation methods for logistic systems, we want to investigate especially the emergent behaviour of multi-agent systems in this domain. Our study will focus on the relation between agent behaviour, agent and organisation structure, as well as constrained optimisation.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

Maintaining and strengthening our existing contacts and building new ones to European Research Centres cultivating the above and related areas, by networking activities, exchanging both scientific and educational materials, arranging mutual visits and organising a workshop. Establishing and developing an on-line accessible web site.

**Potential partners involved**

University of Leiden (The Netherlands), CWI, Amsterdam (The Netherlands), University of Magdeburg (Germany), University of Frankfurt (Germany), University of Pisa (Italy), University Rovira i Virgili, Tarragona (Spain), Technical University of Wien (Austria), Turku Centre for Computer Science (Finland), Silesian University at Opava (The Czech Republic), University of Bucharest (Romania), Mathematical Institute of the Romanian Academy, Bucharest (Romania), University of Szeged (Hungary), University of Debrecen (Hungary).

**Deliverables, expected results, milestone for the overall package**

Deliverables: Publications, WS proceedings, Annual Progress Reports and web updates.

D 5.1: Annual Progress Report and Report on the web site, +12 months

D 5.2: Annual Progress Report and Report on the web site, +24 months

D 5.3: Annual Progress Report and Report on the web site, +34months

<sup>1</sup> Month 0 being the start of the project

<b>B4.3</b>	<b>Work package description</b>
<p><b>Work package number and title: WP 6</b>  <i>High-performance symbolic computation -HPSC Resource Centre, HPSC network and courses,  Courses in financial mathematics</i></p> <p><b>Type of activity CO, V2, WS, V1, other.</b></p> <p><b>Relative start month<sup>1</sup>: 0</b></p> <p><b>Timetable: months 0-36</b></p>	
<p><b>Objectives:</b> By establishing a centre of resources for high performance symbolic computation, we could join the European mainstream. We could then implement our existing methods, which have received scientific recognition as theoretical/experimental results on up to date platforms. These are of significance in relation to Key Actions (ii) and (iv) of Theme 2 of the Programme. The centre will contribute to research and education in cryptography and in the development and spreading new technologies for processing scientific information. We intend to establish regular and permanent contacts (in the form of a network of interested partners) with groups of similar profile in Europe, most notably with one from the TUE. We shall establish contact with universities of the region having (or intending to have) related topics in their curricula (BME, ELTE, KLTE).</p> <p>We wish to organize a minicourse for interested professionals (graduate students, teachers, users of symbolic tools) to demonstrate the power and applicability of symbolic computational tools for large instances of problems.</p>	
<p><b>Description of the contents, the workplan, the steps, the approach or the methodology:</b> Symbolic computational systems, such as Mathematica, Maple, etc., have become important tools in education and, to a certain extent, in the design process of engineering as well. These systems offer a rich variety of efficient tools for handling various mathematical structures. In addition to the traditional approach of numerical calculations, where approximate computations prevail, these systems support the exact (symbolic) handling of the objects. Also they are complete with user-friendly interfaces and applications-building capabilities. Until recently, however, the use of these systems was limited to problems of modest size. This was due to both hardware (lack of sufficient computing power) and software (very robust but slow algorithms) reasons. It appears that the above situation is changing these days. The recent advances of computing science and technology are about to make it possible to solve large problems emerging in scientific research and engineering practice with the next generation of symbolic systems. A substantial part of the developments have taken place in the European Community. It would be advantageous for Hungary and possibly for the wider geographical area to acquire the new know-how, which, among other things, allows to build more precise and refined mathematical models and hence allows to better take some key European issues (such as safety, preserving the environment and minimal use of natural resources) into consideration.</p> <p>In response to these developments, the group at the Informatics Laboratory, led by Dr. Lajos Ronyai intends to establish a centre of resources which could serve the region by providing tools of and disseminating knowledge on high-performance symbolic computation.</p> <p>Setting up a resource centre for high-performance symbolic computations at the SZTAKI. Months: 0-12.</p> <p>We plan to run test suits with up-to-date hardware workstation power and strong software platforms for testing new models and evaluating the new limits of complex tasks that could be solved with high-performance symbolic computation techniques. In particular, we intend to upgrade our existing software, and wish to collect the best freeware (such as GAP and Macaulay2).</p> <p>We intend to build regular contacts with some major centres of symbolic computation in Europe. This way, we could share experiences, research results and know-how. In particular, we would like to strengthen the existing ties with the TUE. This would provide an advantageous blend of complementary expertise. Our long-term goal is to belong to the group of research institutions now forming the core of ESPRIT Project 24969 (OpenMath). We plan to cooperate with the major Hungarian universities which have related topics in their curricula. These would include the BME, ELTE and KLTE. This way, we could disseminate our results and knowledge to a large number of future professionals of computer technologies. Considering that some aspects of symbolic computation seem to be in high demand on the market (for example cryptography based on</p>	

algebraic/arithmetical structures), this would improve their employment prospects. We would then jointly develop courses, or integrate our speciality into existing ones.

We organize a mini-course for interested professionals (graduate students, teachers, users of symbolic tools) to demonstrate the power and applicability of symbolic computational tools for large instances of problems. Months 19-26 for preparation, organization. In addition to our staff members, we wish to invite 1-2 leading experts from Western Europe to give tutorial- and survey-type lectures. Here we would highlight on the usefulness and applicability of symbolic computational devices in the solution of a wide variety of problems coming from different application areas.

We intend to establish a working group and deliver a mini-course on financial mathematics.

#### **Partners involved**

The Department of Discrete Mathematics and Computer Science, Technical University of Eindhoven (TUE), Eindhoven, The Netherlands.

The Department of Computer Science and Information Theory, Technical University of Budapest (BME), Budapest, Hungary.

The Department of Information Sciences, Eötvös Loránd University of Sciences (ELTE), Budapest, Hungary.

The Department of Computer Science, Kossuth Lajos University (KLTE), Debrecen, Hungary.

CNR Latseb, Padova

#### **Deliverables, expected results, milestone for the overall package**

As the principal result of the package, a centre of resources in high-performance symbolic computations would be established. The group of participating researchers would be, on the one hand, firmly embedded into the wide European community of the field, on the other hand, could disseminate their knowledge and know-how in Hungary and possibly in the neighbouring regions of Central Europe.:

D 6.1: A report on the operational resource centre +12 months

#### *Milestones:*

M1: The equipment for the resource centre is operational +6 months

M2: Application of the symbolic testbed to a large problem is completed +12 months.

M3: Running mini-course

Month 0 being the start of the project

**B4.3****Work package description****Work package number and title: WP7**

*Virtual Laboratory for IMS, (intelligent manufacturing processes and systems), corresponding networking, conferences (IEA/AIE-2001 and 10<sup>th</sup> IMECO TC-10) and mutual visits*

**Type of activity :** CO, other, VR,CF, V1-4

**Relative start month<sup>1</sup>:** 0

**Timetable:** months 0-36

**Objectives:**

One of the first definitions of *Intelligent Manufacturing Systems (IMSS)* comes from the SZTAKI (J. Hatvany, 1978): IMSSs are expected to solve, within certain limits, unprecedented, unforeseen problems on the basis even of incomplete and imprecise information. Though the *World-wide IMS Programme* initiated by H. Yoshikawa, Science Council, Japan, in 1992 was closed for this region of Europe, our activities were recognised by holding *The Second World Congress on Intelligent Manufacturing Processes & Systems* in Budapest, 1997. The main objective of this WP is to support and accelerate our active participation in the European Network of Laboratories working in the field of IMSSs.

We wish to set up a virtual laboratory on IMS at the SZTAKI in order to have a compatible platform with leading European institutions working in the field of IMSSs. This includes the purchasing and installation of the necessary sw/hw tools and establishing the network connection to some of these Laboratories. The IMS virtual laboratory will constitute an integral part of a laboratory of Digital Factories.

We need to support the organisation of two prestigious conferences in Budapest:

The Third International Workshop on Learning in IMSSs (*CIRP, International Institution of Production Engineering Research*)

*The 14th International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems* (International Society of Applied Intelligence)

We plan several mutual visits to and from European IMS Research Centres, to near the research activities, develop new ideas, elaborate new project proposals for the 5<sup>th</sup> Framework Programme, and last but not least, to strengthen personal contacts.

We are organizing the 10<sup>th</sup> IMECO TC -10 International Conference on Technical Diagnostics, September, 2001 , Budapest.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

Maintaining and strengthening our existing contacts and building new ones to leading European research Centres of the field, by: networking activities, twinning arrangement, exchanging educational material, harmonising curricula, establishing virtual laboratories, arranging mutual visits, and organising conferences.

Design and specification of the elements of the virtual laboratory, taking the compatibility with potential partner Centres into account, purchasing the selected hw/sw tools, installation and test of the tools. Making the virtual laboratory available for regular use.

At *The Third International Workshop on Learning in IMSSs*, as the title indicates, novel approaches of machine learning and their applicability in IMSSs are addressed.

At *The 14th International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems*, the scope is related to both the AI techniques and fields of application.

**Potential partners**

Catholic University, Leuven, Belgium (Prof. H. Van Brussel); Klaus Grund, Frankfurt, Germany, University of Kaiserslautern, Germany (Prof. G. Warnecke); Fraunhofer Institute for Manufacturing Engineering and Automation, Stuttgart, Germany (Prof. E. Westkämper); ITIA-CNR, Milan, Italy (Prof. F. Jovane); Technical University, Milan (Prof. M. Garetti), University of Patras, Greece (Prof. P. Groumpos); Technical University, Budapest, Hungary (Prof. M. Horváth); University of Miskolc, Hungary (Prof. T. Tóth);

**Deliverables, expected results, milestone for the overall package:**

The expected results are as follows: increased networking between centres, contribution to capacity building through attracting young researchers, enhanced participation in other areas of the 5<sup>th</sup> Framework Programme, disseminating the knowledge in Hungary and in the region.

## Deliverables:

D 7.1.: Yearly Report on activities, the virtual lab, travels, Conf. proceedings,+12 months

D 7.2.: Yearly Report on activities, the virtual lab, travels, Conf. +24 months

D 7.3.: Yearly Report on activities, the virtual lab, travels, Conf. +36 months

1

Month 0 being the start of the project



B4.3	Work package description
<p><b>Work package number and title: WP8</b>  <i>Information systems for Extended and Virtual Enterprises, Holonic Manufacturing, Virtual laboratory, Visits to and from EU Research Centres, Membership and activity in PLANET network.</i></p> <p><b>Type of activity : CO, VR, V1-4, other</b>  <b>Relative start month<sup>1</sup>: 0</b>  <b>Timetable: months 0-36</b></p>	
<p><b>Objectives:</b></p> <p>Extended and virtual and holonic enterprises (EEs, VE, HEs) as manifestations of globalisation, using the latest results of information technology, on the one hand, strive for spanning the whole value chain, and on the other hand, enter into alliance with temporal or strategic partners for accomplishing special tasks within the chain. The main objective of this WP is to support SZTAKI's joining the network of the European institutions working in this new field.</p> <p>The other objective of this WP is to set up a virtual laboratory at SZTAKI in order to have a compatible platform with leading European institutions working in the field of EEs. This includes the purchasing and installation of the necessary SW/HW tools and establishing the network connection to some other Laboratories.</p> <p>We plan to support mutual visits to and from European Research Centres focusing on information systems for extended or virtual enterprises. Other important goals are: to harmonise the research activities, develop new ideas, elaborate new project proposals for the 5<sup>th</sup> Framework Programme, and last but not least, to strengthen personal contacts.</p> <p>Active membership in PLANET, the leading scientific organisation in Europe in the field of Artificial Intelligence Planning and Scheduling is another objective.</p>	
<p><b>Description of the contents, the workplan, the steps, the approach or the methodology:</b></p> <p>Maintaining and strengthening our existing contacts and building new ones to leading European research Centres of the field, by: arranging mutual visits, using compatible tools, establishing virtual laboratories, networking activities.</p> <p>The work will consist of the following activities:  Design and specification of the elements of the virtual laboratory, taking the compatibility with potential partner Centres into account.  Purchasing the selected SW/HW tools.  Installation and test of the tools.  Making the virtual laboratory available for experimental use.</p> <p>The expected results of the visits are: publications in prestigious journals, presentations at international conferences, development of the virtual laboratory, and the initiation of new project proposals within the 5<sup>th</sup> Framework Programme.</p> <p>PLANET is a Network of Excellence funded from Esprit, the European Information Technologies Programme. PLANET is a coordinating organisation for European research and development in the field of Artificial Intelligence Planning and Scheduling. It aims at increasing the cooperation and visibility of planning and scheduling research and application, and promoting the transfer of this leading-edge technology into European industry.</p> <p>Currently, work in PLANET is concentrated on several topics of interest. The SZTAKI can contribute in particular to Dynamic Scheduling, planning and scheduling aspects of Intelligent Manufacturing, and to Knowledge Engineering for planning and scheduling. The SZTAKI can be active in three areas: (1) research co-ordination (2) teaching and training, and (3) infrastructure and management. Our work in PLANET will focus on:</p>	

- \* *Participation* in PLANET's events.
- \* *Teaching*: Introductory, advanced and postgraduate courses on AI planning and its industrial applications.
- \* *Infrastructure and management*

**Potential Partners:**

University of Galway, Ireland (Prof. J. Browne), Catholic University, Leuven, Belgium (Prof. H. Van Brussel); Chalmers University of Technology, Sweden (Prof. N. Martensson), University of Hannover, Germany (Prof. H.-P. Wiendahl); Fraunhofer Institute for Manufacturing Engineering and Automation, Stuttgart, Germany (Prof. E. Westkämper); BIBA, Bremen, Germany (Prof. Hirsch); University of Patras, Greece (Prof. P. Groumpos); University of Metz, France (Prof. F. Vernadat); ITIA-CNR, Milan, Italy (Prof. F. Jovane); SINTEF, Norway; Technical University of Budapest, Hungary (Prof. M. Horváth); University of Miskolc, Hungary (Prof. T. Tóth);

Members of the PLANET (<http://planet.dfki.de>), and thus more than 50 members, referenced as "nodes" which are typically either university departments or companies are active in this research area.

**Deliverables, expected results, milestone for the overall package:**

- D 8.1 Report on the installation of the virtual laboratory +12
- D 8.2 Report on HMS –related activities +24
- D 8.3 Report on PLANET activities +24
- D 8.4. Report on contacts and visits. +34 months
- D.8.5 Public course materials on intelligent planning and scheduling

<sup>1</sup> Month 0 being the start of the project

B4.3

**Work package description****Work package number and title: WP9*****Group decision support systems (GDSS) in environmental protection (EP),  
Visits to and from centres for methodological studies in operations research and  
mathematical physics*****Type of activity : CO, VR****Relative start month<sup>1</sup>: 0****Timetable: months 0-36**

**Objectives:** While EP has become a global problem for Europe, even on the local level the decision process is too complex. It requires a joint effort of people from different branches of the (inter)national economy, also from different institutes and organisations including scientific and civil ones. In the process of co-operation and reconciliation of experts, group decision support systems (GDSS) become of exceptional importance. The main objective of this WP is to accelerate the development of GDSS for EP by joining the contributions at the European research Centres.

We wish to strengthen the contacts and building new ones between the leading groups by the support of mutual visits for carrying out joint research and reporting the results at conferences

**Description of the contents, the workplan, the steps, the approach or the methodology:**

In the past few years we were involved into several decision processes concerning environmental impact analysis. A flexible Windows-based Group Decision Support System with visualisation tools was developed and used for aggregating the evaluation given by the experts. On the other hand, environmental pollution problems caused by waste depositories, incinerators, etc. were analysed for municipal or governmental authorities. By mathematical modelling and consequent computation, the pollution of the surrounding territory, including ground water, the river Danube or the air was simulated.

For maintaining and strengthening existing international contacts and building new ones, for exchange and joint preparation of case studies, experiencing with several GDSS for protection of different natural resources; mutual visits for comparing and developing the theoretical background behind GDSS; participation in workshops and conferences, visits up to 2-week length are planned, as total of 2 months.

The methodological research of the Laboratory of Operations Research and Decision Systems has been aiming at application-oriented theoretical studies in a wide variety of topics. Results in optimisation including smooth optimisation, global optimisation, non-smooth optimisation, techniques for large-scale linear programming as well as achievements in singular differential equations including differential-algebraic equations and their discrete counterparts have been published in prestigious international journals. They have been acknowledged by the international scientific community and regularly referred to in the scientific literature. Senior researchers of the Laboratory have been regularly invited to the leading conferences of their fields. A book by T.Rapcsák was published by Kluwer Academic Publishers. For the purpose of joint research and reading reports at conferences, about seven visits are planned in the region, each of 1-2 months long, as a total of 6 months.

**Potential Partners involved:**

Vrije Universiteit Brussel, Belgium; Université Paris-Dauphine, France; University of Strathclyde, United Kingdom; University of Piraeus, Greece; National Environmental Research Institute, Roskilde, Denmark; Technical University of Madrid, Spain; CWI, Amsterdam, The Netherlands. Partners for mutual visits:

University of Pisa, Italy; Technical University of Delft, The Netherlands; University of Zürich, Switzerland; Institute of Mathematics, Hanoi, Vietnam; University of Blaise Pascal, France; Free University of Berlin, Germany; Humboldt University, Berlin, Germany; CWI, Amsterdam, The Netherlands; University of Trier, Germany; Eötvös Loránd University of Sciences, Budapest; Laboratory of Numerical Methods, Computing Centre of Russian Academy of Sciences, Moscow, Russia.

**Deliverables, expected results, milestone for the overall package:**

- D 9.1.: Progress Reports, +15 months
- D 9.2.: Travel summary report, +18 months
- D 9.3.: Progress Reports, +30 months
- D 9.4.: Case studies, +36 months
- D 9.5.: Joint publications, +36 months

**B4.3****Work package description****Work package number and title: WP 10*****Digital Library Technology Research and Development Co-operation,  
Distributed Digital Library Infrastructure for Computer Science and Technology Knowledge  
Dissemination*****Type of activity : CO, V1 , technology demonstration, implementation****Relative start month<sup>1</sup>: 0****Timetable: months 0-36**

**Objectives:** Creation of shared workspaces and other groupware means fostering the co-operation within groups working in the research and development of digital library technologies and other parties interested. Dissemination of digital library technology information among potential users. Organization of scientific and technical workshops and face-to-face meetings and other technical information dissemination channels. Technology demonstration within the interested target user communities (academic, governmental, industrial, etc.).

Foundation of a distributed networked digital library system environment for computer science and technology digital documents, gray literature, scientific, technical papers, reports, course materials, etc. Basic digital library system is created in parallel with the digital document collection process. New advanced features are to be integrated.

Description of the contents, the workplan, the steps, the approach or the methodology:

The rapid expansion of global networks today makes the vision of a global library - the set of all libraries linked in a network, which the user can access from office or home to search, retrieve, and browse collections of interest - increasingly feasible. The accessibility of networked libraries, if properly designed, will give the library a new and more significant role in society than it has traditionally had. However, to explore the full benefits of the networked library, the problem for research and development is not merely how to connect everyone and everything together in the network but rather to achieve a feasible from economic point of view capability to digitise massive corpora of extant and new information from heterogeneous and distributed sources; then to store, search, process and retrieve information from them in a user-friendly way.

The spread of Internet, and the new achievements in information technology give the new time/cost effective basis for exchange of views and opinions on R&D and technical subjects. Electronic publishing and Internet digital library technologies supported by appropriate tools could become the real solutions for researchers and other interested parties all over the world.

Within this Workpackage digital library technology research results are expected and new technology development information dissemination is planned. Workshops, technology demonstrations are organised to foster the acceptance process of these new technologies. Workpackage creates an "umbrella", a focal point of involved interested parties (scientists, engineers, technical and administrative staff, students, etc. ) working in the research and development of digital library technologies providing shared workspaces for the exchange of ideas, research results, technology information, product evaluations, opinions, etc. to support the co-operation between groups of similar interests and work. Co-operation is supported via personal visits to other EU centres of digital library research and development, as well as by inviting internationally respected specialists for short visits, lectures, and short courses.

A digital library is a large corpus of electronically represented information that can be accessed by users. Today information sources are connected via network services thus a mixture of publicly available information and private information shared by collaborators are available. They include reference volumes, books, journals, newspapers, national phone directories, sound and voice recordings, images, video clips, scientific data (raw data streams from instruments and processed information), and private information services. These information sources, when connected electronically through a network, represent important components of an emerging, universally accessible, digital library.

Within this workpackage a specialized distributed digital library system environment is going to be developed. Independently managed repositories of digital entities/documents are going to be connected via standardized protocols thus a universally accessible virtual digital library system is created. The digital library of this type provides a financially feasible capability to digitize massive corpora of extant and new information from heterogeneous and distributed sources; then to store, search, process and retrieve

information from them in a user-friendly way. Anyone with a communication-capable desktop workstation or personal computer can browse through any digitized piece of information, books, papers, reports, images etc. The digital library system of the project provides with the basic storage capability for computer science and technologies' digitized entities, digital documents, gray literature, scientific, technical papers and reports, course materials, product evaluations etc. Digitized corpora of scientific and technical information entities provides with an electronic way of information dissemination for wide target audiences including academic, industrials, governmental or civil users. Partners of this workpackage include national research and (higher) educational centers, departments of computer science and technologies.

The distributed digital library system to be established provides with gateway services for the connection towards international (European and US) information repositories of similar contents. International and national technology transfer processes are to be supported by this new digitized information infrastructure.

**Potential Partners: :**

Shared workspaces, forums, and electronic information dissemination are opened for the public. European ERCIM (The European Research Consortium for Informatics and Mathematics) institutions are partners within this workpackage.

CNR - Consiglio Nazionale delle Ricerche - Italy,

FORTH - Foundation of Research and Technology - Hellas - Greece,

GMD - Gesellschaft für Mathematik und Datenverarbeitung GmbH - Germany,

INRIA - Institut National de Recherche en Informatique et en Automatique -

France, SICS - Swedish Institute of Computer Science - Sweden

**Deliverables, expected results, milestone for the overall package:**

D 10.1: Shared workspace services establishment (+6 months) Word Wide Web technology-based groupware application providing shared workspace service and other supports for collaborative work is set up for information exchange and transfer purposes.

D 10.2: Organization of a workshop to demonstrate the advantages of digital library technologies. (+18 months,)

D 10.3: Short courses of foreign experts (months 12, months 24)6

D 10.4: DDL Basic system establishment +6 months

The basic distributed digital library system is created and digital document content collection is initiated.

D 10.5: Advanced system services integration +12 months

New advanced services are added to the distributed digital library system. Session-oriented search and browse services are integrated and attached.

D 10.6: Digital document entities collection process (continuous)

Digitized document entities collection process is managed during the process. Partners search is carried out to foster the organization of a integrated network of digital repositories of computer science and technology knowledge.

**B4.3 Work package description****Work package number and title: WP 11**

*Information System Technologies and Business Process R-engineering Methods,  
Knowledge transfer and dissemination for quality improvement of software products and processes*

**Type of activity :** CO, V1-4, WS

**Relative start month<sup>1</sup>:** 0

**Timetable:** months 0-36

**Objectives:**

The main objectives of this WP is to help and accelerate our joining the network of the leading European institutions in the field of the most powerful information system-building technologies. These technologies include the latest data modeling results, data mining and data warehouse technologies and the tools of BPR. The other goal is to disseminate European knowledge in the information system and information system building methods in the region.

Our Institute's objective is to encourage the use of software product and process assessment and improvement methodologies in Hungary. The strategy is to establish an expert forum consisting of Hungarian and invited European Union experts who will discuss the best ways of achieving the objective. The expert forum will organise conferences with both local and international scope, and will form a resources pool where team members for specific projects can be drawn according to the actual customer's needs.

**Description of the contents, the workplan, the steps, the approach or the methodology:**

Maintaining and strengthening our existing contacts and building new ones to leading European research centres in information systems by:

arranging mutual visits,  
organizing training events and seminars,  
exchanging educational and training materials,  
developing new educational materials,  
extended network activities

MTA SZTAKI will be a central co-ordinator of dissemination, collaboration, and the establishment of a Competence Pool in the area of software product and process quality improvement in Hungary.

Dissemination will be performed through newsletters, workshops, and conferences. Collaboration will be achieved by bringing together local and European Union experts into an Expert Forum which would regularly meet preferably in connection with Conferences and also through a World-wide Web forum operated by MTA SZTAKI.

The Expert Forum would be used as a Competence Pool where team members for specific projects can be drawn according to the actual customers' needs. SME's would get special attention when initiating such projects.

**Partners involved:**

Institute of Mathematics and Informatics Bulgarian Academy of Sciences, Sofia, Bulgaria; University of Graz; INRIA, Paris, France; ELTE University of Sciences, Budapest, Hungary; KLTE University, Debrecen, Hungary

**Deliverables, expected results, milestone for the overall package:**

Increased information exchange and dissemination among the partners,

Contribution to capacity building through attracting young researchers,

Enhanced participation in the 5th Framework Programme RTD actions,

Dissemination of the knowledge in the information systems and BPR methods in Hungary and in the region (training courses, workshops, seminars, etc.),

D 11.1: Development of a Ph.D. course in database management and BPR methods,

D 11.2: Organisation of national workshops and seminars.

Increased communication between the partners,

Contribution to capacity building through attracting young researchers,

Enhanced participation in the 5th Framework Programme,

D 11.3.: Dissemination of the knowledge in software product and process quality improvement in Hungary and in the region (training courses, workshops, seminars, etc.); report

D 11.4. Ph.D. courses in software product and process quality improvement; report

D 11.5: Organisation of workshops and conferences; report

<b>B4.3</b>	<b>Work package description</b>
<p><b>Work package number and title: WP12</b></p> <p style="text-align: center;"><i>Virtual laboratory for vision in the loop control experiments</i>  <i>Intelligent road vehicle systems: modelling, detection and control</i>  <i>Symposium and workshop organization</i>  <i>Visits to from Research Centres</i></p> <p><b>Type of activity : CO, CF, VR, other</b>  <b>Relative start month<sup>1</sup>: 0</b>  <b>Timetable: months 0-36</b></p>	
<p><b>Objectives:</b></p> <p>The main goal is to set up a compatible laboratory platform to exchange experimental data and modelling, control results.</p> <p>The next goal is to set up and maintain co-ordination among research groups in the field of applying visual information for lane departure and obstacle detection systems for road vehicles to avoid accidents.</p> <p>We will support the dissemination of the results and to have a feedback from the scientific community by organising an informal session related to the IFAC symposium SAFEPROCESS, 2000.</p> <p>For a closer co-operation we offer to organise a special Workshop in Budapest.</p> <p>Mutual visits to and from European Research Centres will assist all the planned work.</p>	
<p><b>Description of the contents, the workplan, the steps, the approach or the methodology:</b></p> <p>High percentage of accidents has been occurred from unintentional lane departures and collisions of heavy road vehicles mainly due to situations where the driver was ignorant, asleep or he/she had an incorrect estimate on the speed of the vehicle when manoeuvring.</p> <p>Applying on-board systems that is capable to sense and predict the dangerous situations can significantly reduce the risk of this situation. This can be realised by applying vision systems and lane detectors that will warn the driver and, in case there is no appropriate response, it controls the vehicle back to the lane and possible slows it down.</p> <p>The vision system can be based on the processing of the image signal of a camera. Edge detection and line recognition methods has to be developed that are capable to perform this computing power demanding problem in real time adapting to the speed of the vehicle.</p> <p>The control of the vehicle back to the lane and keeping it there can be performed by elaborating a suitable <i>vision in the loop</i> control system that applies unilateral braking. This real time control should be adaptive to take the change in vehicle parameters into consideration and robust against unmodelled dynamics and disturbances.</p> <p>The design of experiments, the dissemination of the measurements and the use of these in building the detection and control systems can be organised by setting up virtual laboratories connected to each other by existing computer networks. These laboratories, besides the verification by simulations, can also build prototype architectures for these systems composed of the cameras, image processing hardware and software, operating systems environments and data communication networking on the vehicle.</p> <p>The scope of the IFAC Symposium SAFEPROCESS puts special emphasis on the theoretic and experimental results on integrating fault detection and control (also called safety control) for systems. The vehicle systems applications are one of the most important and emerging areas here. The proposed informal session provides possibilities to bring expected collaborators together.</p> <p>A special workshop is the most useful form of bringing researchers and scientists together for inspiring discussions in the given field of interest.</p> <p>Several visits are planned. The expected results are the elaboration of the joint research profile, find possibilities for joint publications and to establish personal contacts.</p>	



**Partners involved**

Department of Transport Automation, Technical University of Budapest  
Department of Road Vehicles, Technical University of Budapest  
Knorr Bremse R&D, Kecskemét,  
Laboratoire d'Automati

que, National Polytechnique de Grenoble Cedex France,  
Institute of Mechanics, University of Technology, Vienna,  
Institut fuer Automatisierungstechnik, Technische Universitaet Darmstadt.

**Deliverables, expected results, milestone for the overall package:**

Expected results are in increased networking among research centres and enhanced participation in the 5<sup>th</sup> Framework Programme, disseminating the knowledge in Hungary and in the region.

D 12.1.: Yearly Report, installation of the virtual lab. +12 months

D 12.2.: Yearly Report , use of the lab., +24 months

D 12.3.: Final Report , publications, report on the conference and travels +36 months

**Work package number and title: WP1**

*Exploitation and dissemination, travels, workshops, conferences,  
Project Management & co-ordination,*

- D 1.1.: Periodic Progress Report, +12 months  
Preliminary exploitation and dissemination plans
- D 1.2.: Periodic Progress Report, +24 months  
Report on exploitation and dissemination
- D 1.3.: Periodic Progress Report, +36 months  
Report on exploitation and dissemination
- D 1.4.: Final Report, +36 months

Work package number and title: WP 2

Advanced multimedia system architectures and educational and training courseware applications for infrastructure, adoption of video-conferencing infrastructure to support enhanced co-operation means

D 2.1: Report on implementation and exploitation, statistics

**Work package number and title: WP 3**

*Analogic CNN (Cellular Neural Network) theory, algorithms and their application in medical diagnosis*

**Type of activity : CO, V1-4, WS**

**Deliverables, expected results, milestone for the overall package:**

- D 3.1: Papers containing new analogic spatio-temporal algorithms.
- D 3.2: The evaluation of the proposed CNN based diagnostic workstation providing fast, reliable filtering and feature extraction. The proposed methods help doctors to make correct diagnosis.
- D 3.3: Organising a workshop on analogic CNN computing technology.
- D 3.4 Developing teaching materials, multimedia materials and organise video-conferencing to show the capabilities of this new type of computing

**Work package number and title: WP 4**

*Supercomputing centre and corresponding workshops, conferences, mutual visits*

**Type of activity : WS, CF, VI, CO, demonstrations**

- D 4.1: Operational version of the 29-node beowulf cluster, +6 months
- D 4.2: Graphical programming environment for the beowulf cluster, +12 months  
Proceedings of the 7<sup>th</sup> EuroPVM/MPI Conference  
Proceedings of the 3<sup>rd</sup> Austrian-Hungarian WS on Distributed and Parallel Systems
- D 4.3: Specification study of the Hungarian metacomputing testbed, +18 months  
Special issue in the New Generation Computing Journal
- D 4.4: Operational version of the Hungarian metacomputing testbed, +36 months  
Proceedings of the DAPSYS'2002

**Work package number and title: WP5**

***Promoting the development of a research network in modelling multi-agent systems***

**Type of activity : CO , WS, VR, V1, V3, V4**

D 5.1: Annual Progress Report and Report on the web site, +12 months

D 5.2: Annual Progress Report and Report on the web site, +24 months

D 5.3: Annual Progress Report and Report on the web site, +34months

30/11/2000

HUN-TING  
Appendix to the Technical Annex

**Work package number and title: WP 6**

*High-performance symbolic computation -HPSC Resource Centre, HPSC network and courses,  
Courses in financial mathematics*

**Type of activity CO, V2, WS, V1, other.**

D 6.1: A report on the operational resource centre +12 months

**Work package number and title: WP7**

*Virtual Laboratory for IMS,(intelligent manufacturing processes and systems), corresponding networking, conferences (IEA/AIE-2001 and 10<sup>th</sup> IMECO TC-10) and mutual visits*

**Type of activity : CO, other, VR,CF, V1-**

D 7.1.: Yearly Report on activities, the virtual lab, travels, Conf. proceedings,+12 months

D 7.2.: Yearly Report on activities, the virtual lab, travels, Conf. +24 months

D 7.3.: Yearly Report on activities, the virtual lab, travels, Conf. +36 months



**Work package number and title: WP8**

*Information systems for Extended and Virtual Enterprises, Holonic Manufacturing,  
Virtual laboratory, Visits to and from EU Research Centres, Membership and activity in PLANET network.*

**Type of activity : CO, VR, V1-4, other**

- D 8.1 Report on the installation of the virtual laboratory +12
- D 8.2 Report on HMS –related activities +24
- D 8.3 Report on PLANET activities +24
- D 8.4. Report on contacts and visits. +34 months
- D.8.5 Public course materials on intelligent planning and scheduling

**Work package number and title: WP9**

***Group decision support systems (GDSS) in environmental protection (EP),  
Visits to and from centres for methodological studies in operations research and mathematical physics***

**Type of activity : CO, VR**

- D 9.1.: Progress Reports, +15 months
- D 9.2.: Travel summary report, +18 months
- D 9.3.: Progress Reports, +30 months
- D 9.4.: Case studies, +36 months
- D 9.5.: Joint publications, +36 months

**Work package number and title: WP 10*****Digital Library Technology Research and Development Co-operation,  
Distributed Digital Library Infrastructure for Computer Science and Technology Knowledge Dissemination*****Type of activity : CO, V1 , technology demonstration, implementation**

D 10.1: Shared workspace services establishment (+6 months) Word Wide Web technology-based groupware application providing shared workspace service and other supports for collaborative work is set up for information exchange and transfer purposes.

D 10.2: Organization of a workshop to demonstrate the advantages of digital library technologies. (+18 months,)

D 10.3: Short courses of foreign experts (months 12, months 24)6

D 10.4: DDL Basic system establishment +6 months

The basic distributed digital library system is created and digital document content collection is initiated.

D 10.5: Advanced system services integration +12 months

New advanced services are added to the distributed digital library system. Session-oriented search and browse services are integrated and attached.

D 10.6: Digital document entities collection process (continuous)

Digitized document entities collection process is managed during the process. Partners search is carried out to foster the organization of a integrated network of digital repositories of computer science and technology knowledge.

**Work package number and title: WP 11**

***Information System Technologies and Business Process R-engineering Methods,  
Knowledge transfer and dissemination for quality improvement of software products and processes***

**Type of activity : CO, V1-4, WS**

D 11.1: Development of a Ph.D. course in database management and BPR methods,

D 11.2: Organisation of national workshops and seminars.

Increased communication between the partners,

Contribution to capacity building through attracting young researchers,

Enhanced participation in the 5th Framework Programme,

D 11.3.: Dissemination of the knowledge in software product and process quality improvement in Hungary and in the region (training courses, workshops, seminars, etc.); report

D 11.4. Ph.D. courses in software product and process quality improvement; report

D 11.5: Organisation of workshops and conferences; report

**Work package number and title: WP12**

*Virtual laboratory for vision in the loop control experiments  
Intelligent road vehicle systems: modelling, detection and control  
Symposium and workshop organization  
Visits to from Research Centres*

**Type of activity : CO, CF, VR, other**

D 12.1.: Yearly Report, installation of the virtual lab. +12 months

D 12.2.: Yearly Report , use of the lab., +24 months

D 12.3.: Final Report , publications, report on the conference and travels +36 months