

**INFORMATION SOCIETY TECHNOLOGIES
(IST)
PROGRAMME**



ECVision
European Research Network for
Cognitive AI-enabled Computer Vision Systems

Thematic Network

Second Six-Monthly Periodic Management Report

*IST 2001 Workprogramme
Section IV.2.1 – Real-Time Distributed Systems
Sub-section (ii) – Cognitive Vision systems*

Project Acronym:	<i>ECVision</i>
Project Full Title:	European Research Network for Cognitive AI-enabled Computer Vision Systems
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1. INTRODUCTION

This document summarizes the main activities of *ECVision* during its second six months of operation. It also presents a synopsis of the main outcomes under the headings of the various deliverables identified in the contract. Many of the deliverables represent work in progress and, as such, several versions of the same deliverable are to be developed over the lifetime of the project. The versions reported on in this document represent current progress in the achievement of the overall goals. Inevitably, more progress has been made in some areas rather than others. However, all areas – Research Planning, Education and Training, Information Dissemination, Industrial Liaison, Information Infrastructure, and Management – are active and working towards achieving their objectives.

It is probably worth recalling at the outset that the essential goal of *ECVision* is to create a community from disparate backgrounds with the express intent of defining the emerging discipline of cognitive vision and of identifying the best ways of furthering our understanding of the area through research and education, industrial application, and information dissemination. The second six months of *ECVision* has seen considerable advances in achieving this goal and there are several tangible outcomes of the work of the members:

- An initial version of the research roadmap has been developed:
http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf
- An ontology of cognitive computer vision has been created:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/CCVOentry.htm>
- A model curriculum for a course in computer vision has been developed:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>
- An indexed and annotated bibliography of publications has been started:
http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm

All of these are living documents and continue to evolve and grow as the network expands and develops.

2. NEW MEMBERS

Seven new members from four different institutes joined ECVision in this semester. These are as follows:

September 2002 **Vaclav Hlavac**,
Head of the Machine Perception Centre, Czech Technical University.

November 2002 **Edwin Hancock**,
Department of Computer Science, University of York.

Majid Mirmehdi,
Department of Computer Science, University of Bristol.

Dave Bull,
Department of Electrical and Electronic Engineering, University of Bristol.

Tom Troscianko,
Department of Experimental Psychology, University of Bristol.

January 2003 **Christof Eberst**,
Profactor Produktionsforschungs GmbH.

John Gilby & Rebecca Simpson,
Sira Ltd.

3. HIGHLIGHTS OF THE SEMESTER

The following highlights of activities are taken from the announcements and news sections on the *ECVision* website (see <http://www.ecvision.info/news/News.htm> for full details).

September 2002 A **Dagstuhl Seminar** on Cognitive Vision Systems in October 2003 (27.10.03 - 31.10.03) was announced. The organizers are Prof. Henrik I. Christensen, Stockholm & Prof. Hans-Hellmut Nagel, Karlsruhe.

It was decided that all members now eligible for **funding for specific actions**. It is hoped that this will increase the involvement of non-executive committee members in the network.

October 2002 A Specific Action (6-3) was launched to expand the **Cognitive Computer Vision Ontology** and add web links to tutorial material for each of the topics. This action is being undertaken by Bob Fisher, University of Edinburgh.

December 2002 A Specific Action (21-1) was launched to develop further the **Cognitive Computer Vision Ontology**. The goal is to provide new material on imprecise knowledge representations. This action is being undertaken by Isabelle Bloch, Ecole Nationale Supérieure des Telecommunications, France.

February 2003 The Education team began developing a **syllabus** resource for cognitive computer vision education. The first public draft of the resource is at: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>

The **Research Roadmap** Committee held two meetings, one in Paris on the 6th November and one in Amsterdam on the 13th February. The outcome of these meetings is a working document setting out the details of a research roadmap. The current version is available at: http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf

Specific Action 8-1 got underway with the goal of creating **an indexed and annotated bibliography of publications**. Although it hasn't been formally launched at this point, the working version can be found at: http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm

A Specific Action (2-1) was launched to develop a **Summer School in Cognitive Vision**. This action is being undertaken by Wolfgang Förstner, University of Bonn, and Bob Fisher, University of Edinburgh. Details can be found at: <http://www.ipb.uni-bonn.de/events/summerschool03/summerschool03.html>

4. SUMMARY OF ACTIVITIES BY AREA

4.1 Research Planning

Henrik Christensen edited a special issue of AI magazine that is expected to appear in the autumn of 2003. The special issue will feature papers by Nagel, Dickmann and Granlund. It will also include an introduction on cognitive vision.

A workshop on cognitive vision is being organised as part of the Dagstuhl series (26 October -1 November 03). The workshop will feature 41 internationally leading researchers in cognitive vision systems. The organizers are Henrik Christensen and Hans-Helmut Nagel.

There has been significant progress on the creation of a research roadmap. Two meetings were held, one in Paris on the 6th November 2002, and one in Amsterdam on the 13th February. The development of the roadmap was based initially on the basis of the 'research dreams' that were produced in the previous semester. The current document is available at: http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf

4.2 Education and Training

The Edinburgh team has coordinated the following activities:

1. Restructuring and extension of CVonline:
<http://www.dai.ed.ac.uk/CVonline>
2. Reconstruction of an Ontology of Cognitive Computer Vision, with a partial set of hot links from topics to supporting material. About 120 links have been added so far:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/CCVOentry.htm>
3. Construction of a model syllabus for the teaching of Cognitive Computer Vision, with a partial set of hot links from topics to supporting material. About 180 links have been added so far:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>

All three of these items are ongoing.

The University of Bonn and the University of Edinburgh have collaborated extensively on the planning of a summer school on cognitive vision to be held in Germany in August 2003:
<http://www.ipb.uni-bonn.de/events/summerschool03/summerschool03.html>

A Specific Action (21-1) was launched to create new material on imprecise knowledge representations for the Cognitive Computer Vision Ontology. This action is being undertaken by Isabelle Bloch, Ecole Nationale Supérieure des Télécommunications, France.

4.3 Information Dissemination

The creation of an indexed and annotated bibliography of publications (Specific Action 8-1) has been one of the main activities in this period. The activity has been divided into two principal tasks:

1. The identification and indexing of source material, and the creation of abstracts. This material is encapsulated in a marked-up BibTeX bibliography file.
2. The development of a utility that will convert the marked-up BibTeX file to a suite of web pages, including an index page (or set of index pages), bibliography page, and abstract page.

The goal is to have over 500 citations included by the end of the third semester (i.e. August 2003). Although it hasn't been formally launched at this point, the working version can be found at:

http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm

Two review papers have been written:

1. Four approaches ... , to be published in CVIU 2004.
2. Learning Generative Models, to be published in IVC 2003.

Since much of the web-content is resident on sites other than the host ECVision site, it was decided not to produce a CD with the ECVision website since much of the useful material could not be accessed off-line.

A conference – ICVS 2003 International Conference on Computer Vision Systems – with a special theme on cognitive vision systems is being organized. Details may be found at:

<http://dib.joanneum.at/ICVS03/>

Several special issues in journals are planned. These include:

- IVC – Understanding visual behaviour 2002
- IVC – Generative model-based vision 2003
- IVC – Cognitive computer vision systems 2004
- AI Magazine special issue

One best paper prize has been awarded (ECCV 2002) and a number are planned (ICVS 2003 and ECCV 2004).

The quarterly news digest has been circulated to all members at three-month intervals. It includes hot links to all new items and highlights on the *ECVision* web-site.

4.4 Industrial Liaison

The aim of the industrial liaison activity is to identify application drivers, highlight successes, and promote research trials, in all types of industries. Although there are many constituent component to this activity, a specific action (7-1) was launched in the previous semester to write a white paper on industrial applications of cognitive vision. The objective of this action is to collate knowledge of existing systems and opinion future trends in cognitive vision systems in the EU. Although not finally concluded at this point, the working version of the white paper can be accessed at:

http://www.ecvision.info/industrial_liaison/Industrial_Applications_of_Cognitive_Vision.pdf

The work from this white paper is currently being used as input to the research roadmap activity.

A second specific action (7-2) to award a prize for the best application of cognitive vision was also launched in the previous semester. The objectives of this prize are to recognize exploitation of cognitive vision technology, raise the profile for the ECVision network within the application community, and to raise the profile of cognitive vision as a distinct domain. The original closing date of 31st December 2002 was extended to the 28th February 2003. However, despite significant attempts to advertise the prize (120 flyers were distributed at BMVC, 300 at DAGM, 300 at Vision, and many more by email and direct contacts) only three entries were received. Furthermore, the level of entries was deemed by the judging panel to be insufficient to award the prize. The judging panel comprised three representatives from ECVision, Don Braggins, and representatives from ICVS 2003. Consequently, it has been decided to re-extend the deadline and actively solicit invitations from organizations that do have products that qualify as cognitive vision systems. The award will be made later in 2003. Details of the prize can be found at:

http://www.ecvision.info/industrial_liaison/Application_Prize.htm

The activity to identify application drivers is on-going.

The creation of a database of vision vendors is also on-going. The working version can be found at http://www.ecvision.info/industrial_liaison/Database_of_Vision_Vendors.htm

No action has yet been taken in creating a list of industrially-useful cognitive vision techniques or in creating a database of application motivated problems.

4.5 Information Infrastructure

The majority of this effort has been devoted to developing and enhancing the website <http://www.ecvision.info> and to moderating the email from the two email distribution lists ecvision@lists.ecvision.info (all members) and executive@lists.ecvision.info (Executive Committee).

4.6 Management

The Management activity at network level has been handled cooperatively by the Coordinator, David Vernon, and the Executive Committee. This arrangement has worked very well. Jointly, the management responsibilities are:

- Collation and preparation of 6-monthly management reports
- Organization of six-monthly Executive Committee meetings
- Organization of six-monthly Network Workshops
- Processing and reimbursement of members costs
- Preparation of cost statements
- Processing of applications for funding by sponsored members
- Collation and processing of reviews of member status

- Collection and distribution of deliverables
- Assessment of Target Area progress and implementation of corrective

To date, the Advisory Panel has not been called on to adjudicate on any issue.

All of the management work required to coordinate specific areas (*e.g.* research planning, education and training, etc.) is devolved to the two area leaders in each area:

Research Planning:	Henrik Christensen & James Crowley
Education and Training:	Bob Fisher & Wolfgang Förstner
Information Dissemination:	Hilary Buxton & David Vernon
Industrial Liaison:	Patrick Courtney & Monique Thonnat

5. SPECIFIC ACTIONS

As noted in Section 3 – Highlights – three specific actions were launched during the semester. These are:

1. SA6-3: Expansion of the Cognitive Computer Vision Ontology and add web links to tutorial material for each of the topics (Bob Fisher, University of Edinburgh).
2. SA21-1: Creation of material on imprecise knowledge representations for the Cognitive Computer Vision Ontology (Isabelle Bloch, Ecole Nationale Supérieure des Telecommunications)
3. SA2-1: Development of a Summer School in Cognitive Vision (Wolfgang Förstner, University of Bonn, and Bob Fisher, University of Edinburgh).

Complete details of these actions are contained in Appendix 1 of this report.

A total of ten specific actions have now been funded since the launch of the network. A summary of the current status of each specific action can be accessed on the website at:

http://www.ecvision.info/information/Specific_Action_Status.htm

For ease of reference, this information is reproduced below.

<i>Specific Action 1-1:</i>	<i>Best Paper Prize in Cognitive Vision at ECCV'02</i>
Responsible	David Vernon, Computer Applied Techniques Ltd. (Coordinator)
Area	Information Dissemination
Goals	Promotion of the discipline
Amount (euro)	800
Start Date	26/5/2002
End Date	31/5/2002
Status	Complete
Links	Winning Paper

<i>Specific Action 2-1:</i>	<i>Summer School on Cognitive Computer Vision</i>
Responsible	Wolfgang Foerstner, University of Bonn
Area	Education and Training
Goals	Provide an intensive and challenging introduction to the area of cognitive computer vision.
Amount (euro)	33,980
Start Date	1/3/2003
End Date	31/8/2003
Status	Start-up phase
Links	Summer School Website

<i>Specific Action 6-1:</i>	<i>Cognitive Vision Education Survey</i>
Responsible	Bob Fisher, University of Edinburgh
Area	Education and Training
Goals	Survey of what is already taught worldwide in the area of cognitive computer vision
Amount (euro)	5,800
Start Date	1/5/2002
End Date	30/5/2002
Status	Complete
Links	Model Curriculum on Cognitive Computer Vision

Specific Action 6-2:	Restructuring of CVOnline
Responsible	Bob Fisher, University of Edinburgh
Area	Education and Training
Goals	Restructuring CVonline to make the vision concept structure more transparent, as a preparation for linking in the cognitive vision syllabus that ECVision will be developing
Amount (euro)	2,800
Start Date	1/5/2002
End Date	30/6/2002
Status	Complete
Links	CVOnline
<hr/>	
Specific Action 6-3:	Encyclopedia of Cognitive Computer Vision
Responsible	Bob Fisher, University of Edinburgh
Area	Education and Training
Goals	To take the developing "ontology" of Cognitive Computer Vision and add web links to tutorial materials for each of the topics.
Amount (euro)	5,700
Start Date	1/10/2002
End Date	28/2/2005
Status	On-going
Links	Cognitive Vision Ontology
<hr/>	
Specific Action 7-1:	White Paper on Applications of Cognitive Vision Systems
Responsible	Patrick Courtney, PBConsulting
Area	Industrial Liaison
Goals	To collate knowledge of existing systems and opinion on future trends in cognitive system systems in the EU
Amount (euro)	12,400
Start Date	1/5/2002
End Date	30/9/2002
Status	Complete
Links	White Paper on Applications of Cognitive Vision Systems
<hr/>	
Specific Action 7-2:	Prize for Best Application Development in Cognitive Vision Systems
Responsible	Patrick Courtney, PBConsulting
Area	Industrial Liaison
Goals	To recognize exploitation of cognitive vision technology, to raise the profile for the ECVision network within the application community, and to raise the profile of cognitive vision as a distinct domain
Amount (euro)	7,900
Start Date	1/5/2002
End Date	31/12/2003
Status	On-going
Links	Application Prize Website
<hr/>	
Specific Action 8-1:	Keyword Indexed Bibliography with Abstracts of Papers
Responsible	Hilary Buxton, University of Sussex
Area	Information Dissemination
Goals	Development of keyword indexed bibliography with abstracts of papers
Amount (euro)	19,000
Start Date	1/10/2002
End Date	28/2/2005
Status	On-going
Links	Indexed and Annotated Bibliography

Specific Action 13-1: ICVS'03 - 3rd International Conference on Computer Vision Systems

Responsible Markus Vincze, Technical University of Vienna
 Area Information Dissemination
 Goals - Document the emergence of an engineering science of Computer Vision Systems and Cognitive Vision Systems
 - Discuss the embedding of complete machine vision systems within the real world
 - Increase the visibility of Cognitive Vision internationally
 Amount (euro) 5,732
 Start Date 1/2/2003
 End Date 30/4/2003
 Status Completed
 Links [ICVS 2003 Website](#)

Specific Action 21-1: Cognitive Computer Vision Ontology Development

Responsible Isabelle Bloch, Ecole Nationale Supérieure des Telecommunications, France
 Area Education and Training
 Goals To create new material on imprecise knowledge representations for the Cognitive Computer Vision Ontology
 Amount (euro) 6,000
 Start Date 1/1/2003
 End Date 30/4/2003
 Status On-going
 Links to Associated Documents [Draft Report on Imprecise Spatial Information in Cognitive Vision](#)

6. DELIVERABLES

Most ECVision deliverables reflect work in progress and are reported on over the lifetime of the project. These deliverables are distinguished by a delivery month and are denoted $TA_{x.y.n}$; the n denoting the month at which the current version is to be delivered. Any outstanding work in one of these deliverables is automatically carried forward to the next period.

However, some deliverables identified in the contract are due to be undertaken and completed in a given semester. If they are not completed, they must either be formally removed from the workplan, with the agreement of the Commission, or explicitly carried forward to the next period for completion.

In this section, we report first on the deliverables that have not been completed in the previous period (and not removed from the workplan) and thus have been carried forward to the current period (i.e. Semester 2). We then turn our attention to the deliverables due in this period proper.

6.1 Outstanding Deliverables Due from Previous Period

Research Planning

- TA1.3 Advances in computer vision
Status: this work is still to be initiated due to insufficient human resources. It is hoped that the special issue of the AI magazine to be compiled will form the basis for this paper.
Action: carry forward to next period.
- TA1.4 Advances in artificial intelligence
Status: this paper is presently being drafted by Hilary Buxton and a complementary summary has been prepared for the Research Roadmap.
Action: carry forward to next period.
- TA1.6 Benchmark applications
Status: This effort has not yet been commenced. It awaits a tighter dialogue with the industrial applications areas (which has now been initiated). It is felt that a majority of the benchmarks ought to be grounded in real application demands.
Action: carry forward to next period.

Education and Training

- TA2.3.6 Web repository of MSc and PhD project proposals
Status: no progress has been made on this to date. Concerns over the protection of valuable intellectual property rights inherent in the ideas involved in a good proposal are inhibiting this activity.
Action: carry forward to next period.

Industrial Liaison

- TA4.4.6 List of techniques and their usefulness in certain classes of problems
Status: no action has been taken on this activity so far.
Action: carry forward to next period.

6.2 Deliverables Due in the Current Period (Month 12)

Research Planning

- TA1.1.n Workshop proceeding/report; n = 6, **12**, ..., 36
Status: Two workshops were held: Paris 6th November and Amsterdam 13th February. The output of these workshop have been incorporated into the working version of the research roadmap.
Action: None.
On-line Documents:
http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf
- TA1.2.n Position paper; n= 6, **12**, ... , 36
Status: Seven position papers – research dreams – have been generated. These have provided significant input for the research roadmap.
Action: None.
On-line Documents:
http://www.ecvision.info/research_planning/Research_Dreams.htm
- TA1.5.n White paper on cognitive vision research; n = 6, **12**, ... , 36
Status: No progress has been made yet on this activity.
Action: Carry forward to next semester.
On-line Documents: N/A.
- TA1.7.n Research Roadmap; n = 6, **12**, ... , 36
Status: This document is presently at version 5.
Action: A third workshop is to be scheduled for the coming semester.
On-line Documents:
http://www.ecvision.info/research_planning/Working_Documents.htm
- TA1.8.n Database of European research; n = 6, **12**, ... , 36
Status: A database of active research groups in Europe, ordered by country, has been developed by KTH. A supplementary list of groups with specific interest in cognitive vision is also available.
Action: Continue to maintain and update..
On-line Documents:
http://www.ecvision.info/research_planning/EU_Computer_Vision_Groups.htm
http://www.ecvision.info/information/Research_Groups.htm

Education and Training

- TA2.4 Model curriculum for cognitive computer vision
Status: This is under development and is evolving well. The classification of techniques has proved very useful in a number of contexts.
Action: Continue to maintain and update.
On-line Documents: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>
- TA2.5 Web-based encyclopedia of cognitive computer vision
Status: This is under development and is evolving well. It is currently being developed under the heading of an ontology of cognitive computer vision. As a separate but complementary action, CVOnline has been re-structured to allow cognitive vision topics to be integrated transparently.
Action: Continue to maintain and update.
On-line Documents:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/CCVOentry.htm>
<http://www.dai.ed.ac.uk/CVonline/>
- TA2.6 Web-based listings of available positions and people seeking positions
Status: Complete.
Action: Continue to maintain and update.
On-line Documents:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/joblist.htm>
- TA2.7.n Annual Best Ph.D. prizes in Cognitive Vision Systems; n = 12, 24, 36
Status: None awarded in this semester.
Action: None.
On-line Documents: None.
- TA2.8.n Annual summer school on Cognitive Vision Systems; n = 7, 19, 31
Status: Currently being organized by the University of Bonn and the University of Edinburgh. Target dates are 25th-29th August 2003.
Action: Carry on with organization.
On-line Documents:
<http://www.ipb.uni-bonn.de/events/summerschool03/summerschool03.html>
- TA2.9.n Organization of tutorials; n = 12, 24, 36
Status: The possibility of running tutorials in conjunction with (just prior to) the summer school is presently being disussed.
Action: None.
On-line Documents: N/A.
- TA2.10.n Identification of common development environments; n = 12, 24, 36
Status: A list of general computer vision environments is available at CVOnline. Although ECVision did not contribute directly to this section, it did fund a significant restructuring of CVOnline.
Action: None.
On-line Documents: <http://www.dai.ed.ac.uk/CVonline/environ.htm>

- TA2.11.n Contribution of code to the VXL and/or OpenCV; n = **12**, 24, 36
Status: No progress yet on this activity.
Action: Carry forward to the next semester.
On-line Documents: N/A.
- TA2.12.n Short-term exchange/visits of research staff; n = **12**, 24, 36
Status: No exchanges or visits have been funded to date.
Action: None.
On-line Documents: N/A.
- TA2.13.n Short-term exchange/visits of post-graduate students; n = **12**, 24, 36
Status: No exchanges or visits have been funded to date. However, we have had an enquiry from the University of Bielefeld and we have responded positively. The Executive Committee is awaiting a formal application for a specific action to fund this exchange.
Action: None.
On-line Documents: N/A.

Information Dissemination

- TA3.1.n Electronic newsletter, published quarterly; n = 3, 6, ..., 36
Status: Complete.
Action: None.
On-line Documents: <http://www.ecvision.info/information/news/News.htm>
- TA3.2.n Database of existing relevant publications; n = 6, **12**, ..., 36
Status: This activity has effectively been merged with TA3.2.n (indexed and annotated bibliography). This deliverable accounts for the indexing and dissemination via the website; 3.2 accounts for the creation of the source material. The majority of the work associated with the creation of the web creation utility remains.
Action: Complete the development of the BibGen web creation utility.
On-line Documents:
http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm
- TA3.3.n Annotated bibliography of literature; n = 6, **12**, ..., 36
Status: A considerable amount of work has been done on this deliverable as part of Specific Action 8-1. An initial database of approx 350 citation has been assembled, indexed, and annotated.
Action: Continue to maintain and update; develop web generation utility.
On-line Documents:
http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm
- TA3.4.n Database of research results; n = **12**, 24, ..., 36
Status: As yet, a distinct repository of research results has not yet been created. Instead, the website is being used as an access point for these resources, with links now being directly embedded in the menu structure.
Action: Continue to maintain and update.
On-line Documents: N/A.

- TA3.5.n Periodic distribution of web-site content on CD; n = **12**, 24, 36
Status: Cancelled. Since much of the material referenced from the website is hosted by other sites, it was agreed that an off-line resource such as this had less value than originally anticipated and, consequently, it was decided to drop this deliverable.
Action: None.
On-line Documents: None.
- TA3.6.n Special sessions at conferences; n = **12**, 24, 36
Status: ICVS 2003 is being devoted to the topic of cognitive vision and is being funded by ECVision (Specific Action13-1).
Action: None.
On-line Documents: <http://dib.joanneum.at/ICVS03/>
- TA3.7.n Sponsorship of best paper prizes in cognitive vision; n = **12**, 24, 36
Status: No prizes were sponsored in this semester.
Action: None.
On-line Documents: *Previously-awarded prize papers*
<http://link.springer.de/link/service/series/0558/bibs/2353/23530097.htm> (ECCV'02)
- TA3.8.n Thematic workshops; n = **12**, 24, 36
Status: Apart from the research roadmap meetings, no thematic workshop were held this semester.
Action: None.
On-line Documents: None.
- TA3.9.n Special issues in journals; n = **12**, 24, 36
Status: Four special issues are planned. These are:

 IVC – Understanding visual behaviour 2002
 IVC – Generative model-based vision 2003
 IVC – Cognitive computer vision systems 2004
 AI Magazine special issue

Action: None.
On-line Documents: None.
- TA3.10.n Focussed review papers in journals; n = **12**, 24, 36
Status: Two review papers have been written: one in CVIU in 2004, and the other to be published in IVC in 2003.
Action: None.
On-line Documents: None.

Industrial Liaison

- TA4.1.n Database of research profiles and application experience, indexed by application, R&D topics, industrial sector; n = **12**, 24, 36
Status: No progress has been made yet on this activity.
Action: Carry forward to the next semester.
On-line Documents: None.
- TA4.2.n Directory of vision vendors, indexed by application, product type, deployed technology, industrial sector; n = 6, **12**, ... , 36
Status: The first version is now complete.
Action: Maintain and update.
On-line Documents:
http://www.ecvision.info/industrial_liaison/Database_of_Vision_Vendors.htm
- TA4.3.n Database of application-motivated R&D problems and information on successful and unsuccessful approaches to solutions; n = 6, **12**, ... , 36
Status: No progress has been made yet on this activity.
Action: Carry forward to the next semester.
On-line Documents: None.
- TA4.4.n List of techniques and their usefulness in certain classes of problems; n = 6, **12**, ... , 36
Status: No progress has been made yet on this activity.
Action: Carry forward to the next semester.
On-line Documents: None.
- TA4.5.n Sponsorship of Best Application Development prizes in Cognitive Vision Systems; n = **12**, ... , 36
Status: This activity has been started but is delayed due to the lack of (appropriate) high-quality entries. The deadline extended a second time. The prize plaque has been manufactured.
Action: Pending applications.
On-line Documents:
http://www.ecvision.info/industrial_liaison/Application_Prize.htm

Management

- SA2.1.n Periodic management report; n = 6, **12**, ... , 36
Status: Complete.
Action: None
On-line Documents:
www.ecvision.info/information/Periodic_Management_Reports.htm

7. BUDGETARY STATUS

The network is significantly under-spending at present. The cost statements for the first year totaled €244,694 (semester 1: €94,243; semester 2: €150,451). The budget for the same period is €445,800. The under-spend is therefore €201,105, or approximately 45% of the total budget.

8. CRITICAL ANALYSIS OF ACTIVITIES

The network is operating effectively, with most of the expected outcomes being realized. However, it is clear that only a small subset of the network are actually contributing actively to the network activities (excluding attendance at the six-monthly meetings). Specifically, and with a small number of exceptions, it is the eight members of the Executive Committee that are carrying the lion's share of the work. In addition to their work on the coordination of their particular areas, they are also carrying out the majority of the specific actions. The abolition of the sponsored member status at the end of semester one, whereby any member could apply for funding for a specific action regardless of their level of activity in the network to date, has had little or no effect. In the second semester, only three specific actions were funded, two by members of the executive committee, and one by an ordinary member (ENST). Thus, of the seven specific actions funded to date, only two have been for work undertaken by ordinary members of the network: ENST and the Technical University of Graz. This participation profile is one of the major issues to be tackled over the coming months. To balance this picture, it must also be noted that participation by members at the research roadmap meetings has been good and the network coordinator has received a number of offers, especially from new members, to contribute to the working of the network.

9. CONCLUSIONS AND EXPECTATIONS FOR THE COMING SEMESTER

The ECVision network is active and vigorously pursuing its goals. The coming semester will be a busy one, with several significant events anticipated. These include the International Conference on Computer Vision Systems ICVS 2003, the launch of the indexed and annotated bibliography of cognitive vision publications, the summer school in cognitive vision, and the completion of the research roadmap. The mid-term review will be held early in the fourth semester, probably in September 2003.

APPENDIX I – SPECIFIC ACTIONS FUNDED IN THIS SEMESTER

Education and Training

Specific Action 2-1

Summer School on Cognitive Computer Vision

Specific Action 6-3

Encyclopedia of Cognitive Computer Vision

Specific Action 21-1

Encyclopedia of Cognitive Computer Vision (contribution on imprecise knowledge and associated tools)

Details of each Specific Action are provided below

ECVISION SPECIFIC ACTION DESCRIPTION, WORKPLAN, & BUDGET

SPECIFIC ACTION 2-1 SUMMER SCHOOL ON COGNITIVE COMPUTER VISION

WOLFGANG FÖRSTNER
UNIVERSITÄT BONN
GERMANY

1. Action Area

Education and Training.

2. Goals of the Action

The goal of the proposed summer school is to provide an intensive and challenging introduction to the area of cognitive computer vision. The summer school modules will be given by acknowledged experts in each key area.

3. Concrete Outcomes of the Action

A summer school in cognitive computer vision will be held over a 5-day period, from August 24th to August 29th, 2003. The summer school will be held at the Activotel, Much, Germany. It is expected that there will be 40 participants and 8 lecturers.

4. The Benefits to the Network from Carrying out the Action

The objective is to provide post-graduate students with a comprehensive introduction to all of the constituent areas of cognitive vision. This will help create a new generation of researchers in the area and will help maximize the impact of the ECVision network in the long run. In addition, it will provide practising researchers with an opportunity to learn about areas outside their main speciality and, hence, foster the cross-fertilization of ideas that is essential for real progress in the area.

5. Effort

No funding is requested for effort associated with the organization and running of the summer school. Lecturers are being asked to give freely of their time, although it may be possible to provide them with an honorarium if finances allow.

6. Start and Completion Dates

August 24th – 29th, 2003.

7. Funding

Travel and Subsistence

Lecturers	Number	Individual Cost	Sub-Total
Subsistence (Food and Accommodation)	8	485	3880
Travel (estimated)	8	750	6000
Participants			
Subsistence (Food and Accommodation)	40	420	16800
Labour			
Not applicable			0
Computing			
Network charges, multimedia equipment			1500
Other Specific Costs			
Class Room Rental (5-day charge: 100 euro / person)	48	100	4800
Production of course notes, sundry costs			1000
Total			33980

ECVISION SPECIFIC ACTION DESCRIPTION, WORKPLAN, & BUDGET

SPECIFIC ACTION 6-3 ENCYCLOPEDIA OF COGNITIVE COMPUTER VISION

1. Action Area

Education and Training

2. Goals of the Action

To take the developing "ontology" of Cognitive Computer Vision and add web links to tutorial materials for each of the topics. This will be done by a combination of:

- copying links from CVonline
- web search for new links
- soliciting materials from respected authors
- writing new text

3. Concrete Outcomes of the Action

A web resource with links to teaching materials categorized by topic.

4. The Benefits to the Network from Carrying out the Action

This resource will be usable by:

- students and staff in the ECVision Summer Schools
- members of the ECVision network and others when teaching courses elsewhere
- beginning researchers starting work in the area of Cognitive Computer Vision.

5. Effort

8 person weeks by PhD students

6. Start and Completion Dates

Start: October 1, 2002

End: the majority by March 30, 2003, with updates continuing during the ECVision project.

7. Funding

Travel Costs

€1500 item review at other partner's site.

Computing Costs

€0

Other Project-Specific Costs

€0

Labour Costs

€4200 = 30 person days at €140/day

Total Cost

€5700

ECVISION SPECIFIC ACTION DESCRIPTION, WORKPLAN, & BUDGET

SPECIFIC ACTION 21-1 ENCYCLOPEDIA OF COGNITIVE COMPUTER VISION

ISABELLE BLOCH
ECOLE NATIONALE SUPERIEURE DES TELECOMMUNICATIONS
PARIS, FRANCE

1. Action Area

Based on a course I am teaching at ENST, I would like to propose a contribution, in the EDUCATION AND TRAINING activity, to ECVision.

2. Goals of the Action

This action aims at extending CCV Ontology with aspects related to imprecise knowledge representation in cognitive vision, to tools and methods for dealing with imprecise spatial information, and to information fusion issues and methods.

3. Concrete Outcomes of the Action

Estimated length of the text that will be written: 80-100 pages. A first version will be available as a ps or pdf file, and will then be converted into appropriated web pages to be included in CCV Ontology.

4. The Benefits to the Network from Carrying out the Action

It appears in CVOnline, that in the fusion section, there is nothing on non-probabilistic methods such as fuzzy sets and possibility theory, or belief function theory. Since these theories are important in cognitive vision when several sources of information are available, this could appear also as a part of the Reasoning section of CCV Ontology (Section 3). This can be further subdivided in general consideration on fusion for cognitive vision problems (Section 3.2: Issues), and in formal method description (Section 3.3: Methods). This includes also an important aspect of dealing with spatial information in fusion problems. Moreover, dealing with imprecision in images is a very important issue for cognitive vision, and could be addressed at the level of Knowledge representation (Section 2 of CCV Ontology), and of Reasoning (Section 3.3 in particular).

Contributions on all these aspects will significantly extend the material available in CCV Ontology. It can be very useful for students, mostly at graduate levels, as well as to young researchers involved in these areas.

A more precise scheme of what I propose is attached below.

In this proposal, we restrict ourselves to 3.2 and to 3.3 (fuzzy sets).

5. Effort

Estimated work load: 20 days (spread over 4 months)

6. Start and Completion Dates

January 1st, 2003 - April 30th, 2003

7. Funding

Travel Cost	€0
Computing Costs	€0
Other Project-Specific Costs	€0
Labour Costs	€6000
Total Cost	€6000

Appendix: detailed scientific content of the proposed contribution

Section 3 - Reasoning

Section 3.2 - Issues:

General definitions of information fusion for decision making

- 1 Choice of a definition
- 2 General characteristics of imperfect information
- 3 Numerical / symbolic
 - 3.1 Data and information
 - 3.2 Types of processing
 - 3.3 Types of representations
- 4 Fusion systems and types of architecture
- 5 Fusion in image processing vs fusion in other domains

Fusion in image processing and cognitive vision

- 1 Objectives
- 2 Fusion situations
- 3 Data characteristics
- 4 Constraints
- 5 Numerical and symbolic aspects

Section 3.3 - Methods:

Bases of fuzzy sets and possibility theory

1 Definition of fuzzy set fundamental concepts

- 1.1 Fuzzy sets
- 1.2 Set operations: original definition of L. Zadeh
- 1.3 Structure and types of fuzzy sets
- 1.4 alpha-cuts
- 1.5 Cardinality
- 1.6 Convexity
- 1.7 Fuzzy numbers

2 Fuzzy measures

- 2.1 Fuzzy measure of a crisp set
- 2.2 Examples of fuzzy measures
- 2.3 Fuzzy integrals
- 2.4 Measure of fuzzy sets
- 2.5 Fuzziness measures

3 Elements of possibility theory

- 3.1 Necessity and possibility
- 3.2 Possibility distribution
- 3.3 Semantics

4 Operators

- 4.1 Fuzzy complementation
- 4.2 Triangular norms and conorms
- 4.3 Mean operators
- 4.4 Symmetrical sums
- 4.5 Adaptive operators

5 Linguistic variables

- 5.1 Definition
- 5.2 Example of linguistic variable
- 5.3 Modifiers

6 Fuzzy relations

- 6.1 Definitions
- 6.2 Properties of fuzzy relations
 - Reflexivity
 - Symmetry and anti-symmetry
 - Transitivity
- 6.3 Composition of relations
- 6.4 Similarity relations
- 6.5 Order relations

7 Fuzzy and possibilistic logics

- 7.1 Fuzzy logic
- 7.2 Possibilistic logic

8 General principles for constructing fuzzy operations from binary ones

- 8.1 Extension principle
- 8.2 Combination of operations applied on alpha-cuts
- 8.3 Translation of binary expressions into fuzzy ones
- 8.4 Comparison

Fuzzy sets and possibility theory in image processing and vision: tools for spatial reasoning under imprecision

1 Introduction

2 Representation of spatial information

- 2.1 Fuzzy spatial objects
- 2.2 Set operations
- 2.3 Geometrical fuzzy sets
- 2.4 Geometrical measures of fuzzy objects
- 2.5 Fuzzy geometrical measures of fuzzy objects
- 2.6 Crisp and fuzzy geometrical transforms

3 Fuzzy mathematical morphology

- 3.1 Definitions
- 3.2 Properties
- 3.3 Examples
- 3.4 Conclusion and extensions

4 Fuzzy topology

- 4.1 Fuzzy connectivity and neighborhood
- 4.2 Boundary of a fuzzy object
- 4.3 Adjacency between two fuzzy objects

5 Distances

- 5.1 Representations
- 5.2 Distance from a point to a fuzzy object
- 5.3 Distance between two fuzzy objects
- 5.4 Geodesic distance in a fuzzy set

6 Directional relative position between objects

- 6.1 Main fuzzy approaches
- 6.2 An example

7 Fuzzy classification

- 7.1 Pattern recognition
- 7.2 Fuzzy C-means
- 7.3 Possibilistic C-means
- 7.4 Fuzzy k-nearest neighbors

8 Local operations for filtering or edge detection

- 8.1 Functional approaches
- 8.2 Fuzzy rule-based techniques