

**INFORMATION SOCIETY TECHNOLOGIES
(IST)
PROGRAMME**



ECVision

European Research Network for
Cognitive AI-enabled Computer Vision Systems

Thematic Network

**Third Six-Monthly Periodic Management Report
(Consolidated Report for the Period 1/3/02 – 31/8/03)**

DRAFT

*IST 2001 Workprogramme
Section IV.2.1 – Real-Time Distributed Systems
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1. INTRODUCTION

This document summarizes the main activities of the *ECVision* research network during the third six months of operation. However, since this report coincides with the Commission's mid-term review of the network, *it is presented as a consolidated management report spanning the entire eighteen months of the project*. Developments which are specific to this six-month period will be flagged as appropriate.

The report also presents a synopsis of the main outcomes under the headings of the various deliverables identified in the contract. Most of the deliverables represent work in progress and, as such, several versions of the same deliverable have been and will continue to be developed over the lifetime of the project. The versions reported in this document represent current progress in the achievement of the overall goals. As one would expect, 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 fully active and are achieving their objectives.

It is important to note 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 first eighteen 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 created:
http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm
- A white paper on industrial applications of cognitive vision has been written:
http://www.ecvision.info/industrial_liaison/Industrial_Applications_of_Cognitive_Vision.pdf

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

2. NEW MEMBERS

Two new members joined ECVision in the third semester and a total of 20 new members have joined since the launch of ECVision. This brings the total number of individual members to 57 and the number of institutional members to 44 (from the original 30). Some of these members were admitted automatically as they are partners in cognitive vision projects that were started after the launch of ECVision. Others were not eligible for automatic membership and their applications were subject to a review by the Executive Committee to ensure that their activities were consistent with the objectives of ECVision. Significantly, a number of applications for membership were rejected because the Executive Committee felt that the applicant's profile was not appropriate.

Whilst the complete list of members can be found on the ECVision website at http://www.ecvision.info/members/List_of_Members.htm, the new members are as follows:

<i>Month Admitted</i>	<i>Member</i>
<i>March 2002</i>	Gerald Sommer , Christian-Albrechts-Universität zu Kiel Georg Thallinger , Joanneum Research Lucas Paletta , Joanneum Research Horst Bischof , Graz University of Technology Axel Pinz , Graz University of Technology Paolo Bottoni , University of Rome 'La Sapienza'
<i>April 2002</i>	Ales Leonardis , University of Ljubljana
<i>June 2002</i>	Arnold Smeulders , University of Amsterdam Jeanny Herault , INPG
<i>August 2002</i>	Robert Massen , MASSEN machine vision systems GmbH
<i>September 2002</i>	Piero Mussio , University of Brescia Vaclav Hlavac , Czech Technical University.
<i>November 2002</i>	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.
<i>January 2003</i>	Christof Eberst , Profactor Produktionsforschungs GmbH. John Gilby & Rebecca Simpson , Sira Ltd.

March 2003

Fiora Pirri, University of Rome "La Sapienza"

August 2003

Rainer Malaka, European Media Laboratory GmbH

3. HIGHLIGHTS OF THE FIRST EIGHTEEN MONTHS

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).

- May 2002* Two specific actions in the Education and Training area were approved:
- Specific Action 6-1 **Cognitive Vision Education Survey** and Specific Action 6-2 **Restructuring of CVonline** (<http://www.dai.ed.ac.uk/CVonline/>). The goal of the first action was to identify what is already taught world-wide in cognitive vision. The goal of the second was to make the vision concept structure in CVonline more transparent, as a preparation for linking in the cognitive vision syllabus that *ECVision* will be developing. Both actions are being undertaken by Bob Fisher, University of Edinburgh.
- June 2002* P. Duygulu, K. Barnard, J.F.G. de Freitas and D.A. Forsyth were awarded the **Best Paper prize on Cognitive Computer Vision at ECCV 2002** for their paper "Object Recognition as Machine Translation: Learning a Lexicon for a Fixed Image Vocabulary". See <http://link.springer.de/link/service/series/0558/bibs/2353/23530097.htm> for an abstract of the paper.
- Two specific actions were launched in the Industrial Liaison Area: SA 7-1: The development of a **white paper on applications of cognitive vision systems** (http://www.ecvision.info/industrial_liaison/Industrial_Applications_of_Cognitive_Vision.pdf) and SA 7-2: The creation of a **prize for the best application development in cognitive vision systems** (http://www.ecvision.info/industrial_liaison/Application_Prize.htm). These actions are being undertaken by Patrick Courtney, PBConsulting GmbH.
- ECVision* website links menu now allows to access over 100 sites.
- August 2002* Specific Action 8-1 to develop a **web-based keyword-indexed bibliography with abstracts of papers** was launched (http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm). This work is being undertaken by Hilary Buxton, University of Sussex.
- September 2002* A **Cognitive Vision Workshop**, organized by Bernt Schiele and Luc Van Gool, was held in Zurich on the 19th and 20th September. Details of the workshop are available on the web at <http://www.vision.ethz.ch/cogvis02/>
- 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.
- October 2002* A Specific Action (6-3) to expand the **Cognitive Computer Vision Ontology** was launched; see: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/CCVOEntry.htm>. This action is being undertaken by Bob Fisher, University of Edinburgh.

- December 2002* A Specific Action (21-1) to develop further the **Cognitive Computer Vision Ontology** was launched:
http://www.ecvision.info/education/SA_21-1_Imprecise_Spatial_Information.htm
 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.
- 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>
- April 2003* The **3rd International Conference on Computer Vision Systems ICVS'03** was held in Graz, Austria, from 1st – 3rd April. See:
<http://dib.joanneum.at/ICVS03/>
- A list of all **active computer vision groups in Europe** was made available on the website. This list of groups was compiled and edited by Danica Kragic and Henrik I Christensen, Royal Institute of Technology, Sweden. The list can be accessed at:
http://www.ecvision.info/research_planning/EU_Computer_Vision_Groups.htm
- Version 2.5 of the ECVision cognitive vision research roadmap was launched at:
http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf
 This initiative was coordinated by James Crowley, INPG.
- May 2003* An updated version of the database of **European vision vendors** was published on the website at:
http://www.ecvision.info/industrial_liaison/Database_of_Vision_Vendors.htm
- A **white paper on industrial applications** of cognitive vision published on the website at:
http://www.ecvision.info/industrial_liaison/Industrial_Applications_of_Cognitive_Vision.pdf
 Both of these initiatives were undertaken by Patrick Courtney and Pia Boettcher, PBConsulting GmbH.
- June 2003* The **ECVision indexed and annotated bibliography** of cognitive computer vision publications was launched. The bibliography currently has over 350 entries and it will be updated periodically (members will be notified when this happens). See:
http://www.ecvision.info/bibliography/Indexed_and_Annotated_Bibliography.htm
 This initiative is being undertaken by Hilary Buxton, University of Sussex.

The first version of the results of Specific Action 2-1, dealing with **imprecise spatial information in cognitive vision**, was published on the website at: http://www.ecvision.info/education/SA_21-1_Imprecise_Spatial_Information.htm. This specific action was undertaken by Isabelle Bloch, Ecole Nationale Supérieure des Telecommunications, Paris, France.

July 2003 The ECVision Education team (Bob Fisher and Wolfgang Förstner) have created an **MSc and PhD project topics page** at: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/projects.htm>

The **Cognitive Vision Model Syllabus** now has been linked to the Annotated Bibliography, so clicking on a topic not only gets on-line materials but also citations (where either are known).
See: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>

August 2003 The first specific action (SA 16-1) to support a **student exchange** was approved. The student is Nicolas Gorges, University of Bielefeld, who will visit Josef Kittler's group at the University of Surrey.

The 2003 **ECVision Summer School** on Cognitive Vision was held in Much, Germany. Over sixty people registered for the event. See www.ecvision.info/education/Summer_School_on_Cognitive_Vision_2003.htm for details.

4. SUMMARY OF ACTIVITIES BY AREA

4.1 Research Planning

A Cognitive Vision Workshop, organized by Bernt Schiele and Luc Van Gool, was held in Zurich on the 19th and 20th September. Details of the workshop are available on the web at

<http://www.vision.ethz.ch/cogvis02/>

Seven ‘research dreams’ position papers were prepared during the very early part of the second semester. These are:

1. Towards conscious general vision systems, Ja-M Geusebroek
2. Towards an Intelligent Cognitive Vision Platform, M. Thonnat
3. The Vigilant Environment, David Vernon
4. Research Dreams, Markus Vincze
5. Mapping on demand, Wolfgang Förstner
6. Cognitive vision in life science, Patrick Courtney
7. Interactive Cognitive Vision System, C. Garbay

The papers are available on the *ECVision* website at

http://www.ecvision.info/research_planning/Research_Dreams.htm.

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-Hellmut 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

A list of all active computer vision groups in Europe has been made available on the website. This list of groups was compiled and edited by Danica Kragic and Henrik I Christensen, Computational Vision and Active Perception, Numerical Analysis and Computer Science, Royal Institute of Technology, Sweden. The list can be accessed at:

http://www.ecvision.info/research_planning/EU_Computer_Vision_Groups.htm

4.2 Education and Training

The Edinburgh team has coordinated to following activities:

1. Restructuring and extension of CVonline: <http://www.dai.ed.ac.uk/CVonline>
Content has been added to about 200 more CVonline topics: about 1005 out of 1395 topics have content. More content is still being added.
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. See:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/cvsyldraft.htm>

The syllabus has now has been linked to the Annotated Bibliography, so clicking on a topic not only gets on-line materials but also citations (where either are known).

4. Creation of an MSc and PhD project topics page. This can be viewed at:
<http://www.dai.ed.ac.uk/homes/rbf/CCVO/projects.htm>

All four of these items are ongoing.

Wolfgang Förstner, University of Bonn, organized and ran a very successful summer school on cognitive vision from 24th-29th August, in Much, Germany. Over sixty people registered for the event. Courses were given by Göesta Granlund, Bernd Neumann, Jim Little, and Hans-Hellmut Nagel. See http://www.ecvision.info/education/Summer_School_on_Cognitive_Vision_2003.htm for details.

A Specific Action (21-1) was executed to create new material on imprecise knowledge representations for the Cognitive Computer Vision Ontology. The first version of the results has been published on the website at: http://www.ecvision.info/education/SA_21-1_Imprecise_Spatial_Information.htm. This action was undertaken by Isabelle Bloch, Ecole Nationale Supérieure des Telecommunications, France.

The first specific action (SA 16-1) to support a student exchange was approved. The student is Nicolas Gorges, University of Bielefeld, who will visit Josef Kittler's group at the University of Surrey.

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 over the past year. 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.

At present, the bibliography has over 350 citations and an upgrade to over 500 citations is imminent (the bibliography has been prepared, but not processed with the BibGen utility). The bibliography 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 was held in Graz, from April 1-3. Additional workshop were held on subsequent days. 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

Two best paper prizes have been awarded

- ECCV 2002; see <http://link.springer.de/link/service/series/0558/bibs/2353/23530097.htm> for an abstract of the paper.
- ICVS 2003

Further prizes are planned, e.g. at 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 components to this activity, a specific action (7-1) was launched in semester 1 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. The final 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 semester 1. 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 was decided to re-extend the deadline to 31st July 2003 and actively solicit invitations from organizations that do have products that qualify as cognitive vision systems. The award will be announce on the 8th or 9th October 2003 at Photonex, 03, Stoneleigh Park, UK. 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 and moderating the email from the two email distribution list.

The *ECVision* website was launched originally in April 2002 as www.ECVision.org as a menu-driven website. Unfortunately, it has to be re-launched in August 2002 as www.ECVision.info as the registrar would not allow the .org name to be re-registered despite repeated communications over a six week period. This hiccup notwithstanding, the website is being reasonably well used although unsolicited contributions from members have been slow in coming. As a mechanism of dissemination of information it is proving very successful. To date, it has received approximately 4900 hits in the year since its re-launch, the majority of which happened after the Annotated Bibliography resource was announced. Efforts to re-gain the .org domain are on-going.

Guidelines for contributors to the website can be found at:
www.ecvision.info/informationGuidelines_for_Web_Authors.htm

It was originally intended to implement a computer-supported cooperative work environment to facilitate discussion forums, document exchange, and email distribution lists. Early on in the project, a bulletin board system was implemented and announced. However, no member ever posted to it so it was allowed to lapse and all effort was redirected to the implementation of the website which has since become a working environment.

Two email distribution lists were implemented:

- | | |
|--|---|
| members@lists.ecvision.info | This address targets all members of the network. It is moderated on a daily basis by the coordinator. |
| executive@lists.ecvision.info | This address targets all members of the Executive Committee. It too is moderated by the coordinator Vernon. |

Both of these lists are actively used.

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

A number of issues are worthy of note:

1. *Six Monthly Cost Statements*
The procedure for preparation of the six-monthly cost-statement was simplified considerably early on in the project. It was agreed with the Commission that members do not have to submit six-monthly cost statements for any directly reimbursed costs, *i.e.* costs for travel, computing, other specific costs which have been reimbursed to the member by the Coordinator. These costs will be recorded on the principal contractor's individual cost statement. *Only members claiming labour (and overheads on labour) need submit cost statements* and these statements will comprise only labour and overhead costs: no travel, computing, or other costs.
2. *Sponsored Membership*
The distinction between ordinary member and sponsored member has been abolished: very little material has been contributed to the website by members and few if any would be eligible for elevation to the status of sponsored membership (and, thus, eligible to apply for funding for specific actions). Consequently, it was decided to abolish the concept of sponsored member and open up the possibility of funding for specific actions to all members in the hope that this will promote more activity in the network (and the delivery of more material).
3. *Applications for Membership*
In general, the procedure for application for membership has worked well. The procedure is that the application is submitted to the Coordinator, who distributes it to the Executive Committee for discussion. Typically, the Executive Committee will vote on the applications.

With the Coordinators casting vote it essentially takes just four votes in favour of an application to have it accepted. Most of the discussions have centred on the profile of the applicant, with the requirement that the applicant exhibit real activity in the area of cognitive vision being strongly enforced (perhaps not quite as strongly as some would like but strongly nonetheless). The impact of this is that a number of applications, who would be considered *bone fide* members of the computer vision community, have been declined membership. It was felt that this was necessary if ECVision is to keep its identity as a cognitive vision oriented network and not become a general computer vision network.

4. *Approval of Specific Actions*

The procedure for application for funding of specific actions has also worked very well. In a similar manner to the above, the application is submitted to the Coordinator, who distributes it to the Executive Committee for discussion. Typically, the Executive Committee will vote on the applications. Once they reach a consensus, the application is forwarded to the Commission Project Officer, Colette Maloney, for approval. This procedure has ensured that focussed high-quality specific actions have been submitted and funded.

5. SPECIFIC ACTIONS

Two specific actions were launched during the semester. These are:

1. Specific Action 37-1: WAPCV 2003 - Workshop on Attention and Performance in Computer Vision (Lucas Paletta, Joanneum Research)
2. Specific Action 16-1: Student Exchange: University of Bielefeld and University of Surrey

A total of twelve 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. Complete details of all specific actions are contained a separate report.

<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	Complete
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

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

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

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

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 16-1:	Student Exchange: University of Bielefeld and University of Surrey
Responsible	Member: Gerhard Sagerer, University of Bielefeld Student: Nicolas Gorges, University of Bielefeld
Area	Education and Training
Goals	Effect a student exchange between the University of Bielefeld and the University of Surrey. During the visit, the student will work on his diploma thesis dealing with image mosaicing.
Amount (euro)	2,715.58
Start Date	1/8/2003
End Date	31/1/2004
Status	On-going
Links to Associated Documents	

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	Complete
Links to Associated Documents	Draft Report on Imprecise Spatial Information in Cognitive Vision

Specific Action 37-1: WAPCV 2003 - Workshop on Attention and Performance in Computer Vision

Responsible	Lucas Paletta, Joanneum Research, Austria
Area	Information Dissemination
Goals	To sponsor invited speakers and proceeding printing costs for WAPCV 2003, held in conjunction with ICVS '03.
Amount (euro)	3,808
Start Date	1/1/2003
End Date	30/6/2003
Status	Complete
Links to Associated Documents	Workshop Website

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 $TAx.y.n$; x denoting the target areas (see below), y the deliverable number, and 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.

The Target Areas are:

- 1 Research Planning
- 2 Education and Training
- 3 Information Dissemination
- 4 Industrial Liaison
- 5 Information Infrastructure
- 6 Management

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 work-plan, with the agreement of the Commission, or explicitly carried forward to the next period for completion.

In this section, we report on all the deliverables identified in the work-plan. In this context, note that this is month 18. Note too that only one deliverable has been removed from the work-plan. This is the periodic distribution of web-site content on CD.

6.1 Research Planning

- TA1.1.n Workshop proceeding/report; n = 6, 12, **18**, ..., 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, **18**, ..., 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
- TA1.3 Advances in computer vision (due month 6)
Status: This work has yet to be initiated. 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 (due month 6)
Status: This work is on-going. Bernd Neumann has written a summary of cognitive vision and artificial intelligence for the current version of the research roadmap (see: http://www.ecvision.info/research_planning/ECVisionRoadMapv2.5.pdf). Another paper is being drafted by Hilary Buxton.
Action: carry forward to next period.
- TA1.5.n White paper on cognitive vision research; n= 6, 12, **18**, ..., 36
Status: No progress has been made yet on this activity.
Action: Carry forward to next semester.
On-line Documents: N/A.
- TA1.6 Benchmark applications (due month 6)
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.
- TA1.7.n Research Roadmap; n= 6, 12, **18**, ..., 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, **18**, ..., 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

6.2 Education and Training

- TA2.1 Survey of existing courses on cognitive computer vision
Status: Complete: an email survey and web searching has been done for existing courses that present material linked to Cognitive Computer Vision. About 8000 requests were sent, 100 replies received and about 50 relevant web-based pieces of information obtained. Most of the surveyed materials were presented as a part of a broader course, that range from 1-60 hours of lectures, with about 20 as average. The survey results have been categorised according to a developing ontology of cognitive vision, which will feed into the encyclopedia and model curriculum activity of the project second half-year.
Action: continue to maintain and update.
On-line Documents: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/CCVOentry.htm>
- TA2.2 Web-based repository of existing courseware and/or course slides
Status: Complete: this has been created as a subset of CVonline.
Action: Continue to maintain and update.
On-line Documents: <http://www.dai.ed.ac.uk/CVonline/>
- TA2.3 Web repository of MSc and PhD project proposals
Status: Complete (but unpopulated!) Concerns over the protection of valuable intellectual property rights inherent in the ideas involved in a good proposal are inhibiting this activity.
Action: continue to maintain and update.
On-line Documents: <http://www.dai.ed.ac.uk/homes/rbf/CCVO/projects.htm>
- 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 complementation 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: Complete: Much, Germany, 25th-29th August 2003.

Action: The organization of a second summer school is being discussed..

On-line Documents:

http://www.ecvision.info/education/Summer_School_on_Cognitive_Vision_2003.htm

- TA2.9.n Organization of tutorials; n = **12**, 24, 36
Status: Complete; this action was subsumed into the five-day summer school above.
Action: None.
On-line Documents:
http://www.ecvision.info/education/Summer_School_on_Cognitive_Vision_2003.htm
- 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: One student exchange has been approved (SA 16-1) from the University of Bielefeld.
Action: None.
On-line Documents: N/A.
- TA2.14 Textbook on cognitive computer vision (due month 36)
Status: Not yet started .
Action: None.
On-line Documents: N/A

6.3 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, 18, ..., 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. A website generation utility has also been developed (by the network coordinator).
Action: Continue to maintain and update.
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: <http://www.ecvision.info>
- 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 was devoted to the topic of cognitive vision and is being funded by ECVision (Specific Action13-1). ECCV now has a specific section for cognitive vision (& visual learning).
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: Two prizes have been awarded to date, one at ECCV '02 and one at ICVS '03.
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: In addition to the research roadmap meetings in Nov. 2002 and Feb. 2003, organized by James Crowley, a Cognitive Vision Workshop in Zurich on the 19th and

20th September 2002 was organized by Bernt Schiele and Luc Van Gool. Another is planned for January 12-13 2004: the cognitive computer vision colloquium being organized by Vaclav Hlavac, Tomas Pajdla, Jiri Matas, Czech Technical University.

Action: None.

On-line Documents: <http://www.vision.ethz.ch/cogvis02/>
http://www.ecvision.info/research_planning/Working_Documents.htm

TA3.9.n

Special issues in journals; n = **12**, 24, 36

Status: Four special issues are planned (or have been produced). These are:

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

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.

6.4 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: The award will be announced on the 8th or 9th October 2003 at Photonex, 03, Stoneleigh Park, UK.
Action: Pending adjudication by the judging panel.
On-line Documents:
http://www.ecvision.info/industrial_liaison/Application_Prize.htm

6.5 Information Infrastructure

- SA1.1 CSCW Infrastructure operational
Status: Complete.
Action: None
On-line Documents:
http://www.ecvision.info/contacts/Executive_Committee.htm
<http://www.ecvision.info/contacts/Members.htm>
- SA1.2 Website core structure implemented
Status: Complete.
Action: None
On-line Documents: <http://www.ecvision.info>

6.6 Management

- SA2.1.n Periodic management report; n = 6, **12**, ... , 36
Status: Complete.
Action: None
On-line Documents: [Project Management Reports](#)
- SA2.2 Final report from ECVision (due month 36)
Status: Pending.
Action: None
On-line Documents: N/A

7. BUDGETARY STATUS

The network continues to under-spend significantly. The cost statements for the eighteen months total €345,293 (semester 1: €94,243; semester 2: €150,451; semester 3: €100,592[est.]). The budget for the same period is €628,500. The under-spend is therefore €283,207, or approximately 45% of the total budget.

8. CRITICAL ANALYSIS OF ACTIVITIES

The network is operating effectively, with almost all of the expected outcomes being realized. Given that the expenditure is very significantly less than the original amount budgeted, this is quite an achievement, especially when one considers the very ambitious schedule of deliverables.

In the previous management reports, it was noted that only a small subset of the network is actually contributing actively to the network activities and that with a small number of exceptions, it was the eight members of the Executive Committee that were carrying the lion's share of the work. Happily, this trend is now changing and we are beginning to see more involvement from ordinary members, either in contributing to meetings, conferences, and the summer school, or in funded specific actions. The challenge for the next semester is to build on this and encourage even further participation. Several members (typically newer members) have communicated their willingness and desire to become more centrally involved in the network and these members will be strongly encouraged.

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 Dagstuhl on cognitive vision in October and the Cognitive Computer Vision Colloquium in January (this is a new specific action that hasn't been included in this report as it was approved in September 2003). As well as these events, members will continue to work away behind the scenes on the next version of the many deliverables discussed above. Many members are also active in preparing proposals for the current call in Cognitive Systems; their participation in ECVision has been viewed as a positive contributing factor to the formation of these partnerships. Finally, it is clear that – deliverables aside – the network is being successful in achieving its superordinate goal: the definition and establishment of the discipline of cognitive vision in all its many guises. Many factors have contributed to this: the cognitive vision ontology, the model syllabus, the research roadmap, the several workshops and conferences, and quite definitely the very lively and invigorating summer school in Bonn. At the mid-point of the project, much has been achieved and much remains to be achieved, but the road is becoming increasingly clear even if the terrain ahead will pose many significant research challenges to the cognitive vision community.