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# Sixth and Final Six-Monthly Meeting

Frankfurt Airport Conference Centre Friday 11<sup>th</sup> February 2005







#### Part I - Goals and Achievements

10:30	Welcome & Overview of the ECVision Network	(DV)
11:00	Research Planning & Research Roadmap	(JC)
11:30	Education and Training	(BF/WF)
12:00	Information Dissemination	(HB/DV)
12:30	Industrial Liaison	(PC/MT)

#### Part II - Follow-on Activities

14:00	Discussion: Lessons Learned & Work Remaining	(All)
15:00	eCognition: A Proposal for a Coordination Action	
	for Cognitive Systems	(DV)
16:00	Open Forum: Questions, Answers, and Future Plans	(HB/DV)
17:00	Close of meeting	(DV)







### Sixth and Final Six-Monthly Meeting

# Overview of the ECVision Network

Frankfurt Airport Conference Centre Friday 11<sup>th</sup> February 2005



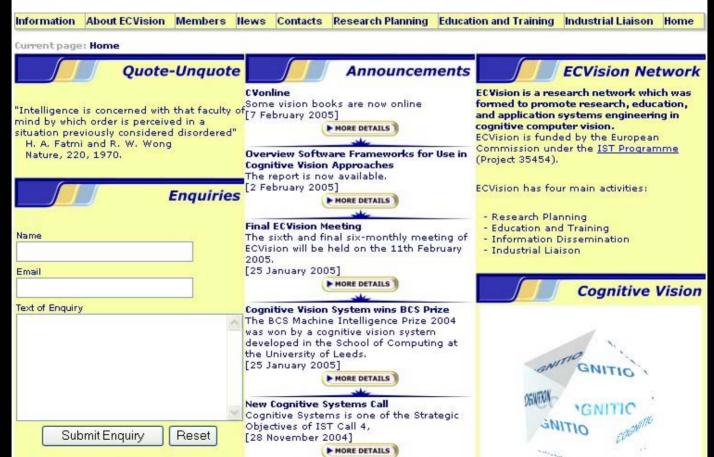




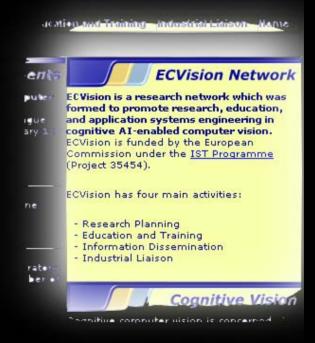
### Goals of the Network







To help define and establish the discipline of cognitive vision







# Organization







Three principal bodies are involved in the running of the network:

- 1. The Executive Committee
- 2. The Advisory Panel
- 3. The European Commission Officer













### **Advisory Panel**

Andrew Blake, Microsoft Research, Cambridge

Mike Brady, University of Oxford

Jan-Olof Eklundh, Royal Institute of Technology

Olivier Faugeras, INRIA Sophia Antipolis

Hans-Hellmut Nagel, University of Karlsruhe

Giulio Sandini, University of Genoa - DIST















### Deliverables



#### List of Deliverables

#### Key:

TAx.y.n Target Area x, deliverable number y, month n

#### Target Areas:

1	Research Planning
2	Education and Training
3	Information Dissemination
4	Industrial Linison
5	Information Infrastructure

Management

No	Deliverable title	Date
TA1.1.n	Workshop proceeding/report; n = 6, 12,, 36	n
TA1.2.n	Position paper; n= 6, 12,, 36	n
TA1.3	Advances in computer vision	6
TA1.4	Advances in artificial intelligence	6
TA1.5.n	White paper on cognitive vision research; $n=6, 12, \dots, 36$	n
TA1.6	Benchmark applications	6
TA1.7.n	Research Roadmap; n = 6, 12,, 36	n
TA1.8.n	Database of European research; n = 6, 12,, 36	n

No	Deliverable title	Dute
TA2.1	Survey of existing courses on cognitive computer vision	6
TA2.2	Web-based repository of existing courseware and/or course slides	6
TA2.3	Web-based repository of M.Sc. and Ph.D. project proposals	6
TA2.4	Model curriculum for cognitive computer vision	12
TA2.5	Web-based encyclopedia of cognitive computer vision	12
TA2.6	Web-based listings of available positions and people seeking positions	12
TA2.7.n	Annual Best Ph.D. prizes in Cognitive Vision Systems; n = 12, 24, 36	n
TA2.8.n	Annual summer school on Cognitive Vision Systems; n = 7, 19, 31	n
TA2.9.n	Organization of tutorials; n = 12, 24, 36	n
TA2.10.n	Identification of common development environments; n = 12, 24, 36	
TA2.11.n	Contribution of code to the VXL and/or OpenCV; n = 12, 24, 36	n
TA2.12.n	Short-term exchange/visits of research staff; n = 12, 24, 36	n
TA2.13.n	Short-term exchange/visits of post-graduate students; n = 12, 24, 36	n
TA2.14	Textbook on cognitive computer vision	36

No	Deliverable title	Date
TA3.1.n	Electronic newsletter, published quarterly; n = 3, 6,, 36	n
TA3.2.n	Database of existing relevant publications; n = 6, 112,, 36	n
TA3.3.n	Annotated bibliography of literature, with summary of papers; $n=6,12,,36$	n
TA3.4.n	Database of research results (presentations, videos,); n = 12, 24,, 36	n
TA3.5.n	Periodic distribution of web-site content on CD to all members; n = 12, 24, 36	n
TA3.6.n	Special sessions at conferences; n = 12, 24, 36	m
TA3.7.n	Sponsorship of best paper prizes in cognitive vision systems; n = 12, 24, 36	n
TA3.8.n.	Thematic workshops; n = 12, 24, 36	n
TA3.9.n	Special issues in journals; n = 12, 24, 36	n
TA3.10.n	Focussed review papers in journals; n = 12, 24, 36	36
No	Deliverable title	Dute
TA4.1.n	Database of research profiles and application experience, indexed by application, R&D topics, industrial sector; n = 12, 24, 36	n
TA4.2.n	Directory of vision vendors, indexed by application, product type, deployed technology, industrial sector; $n=6,12,\dots,36$	n
TA4.3.n	Database of application-motivated R&D problems and information on successful and unsuccessful approaches to solutions; $n=6,12,\ldots,36$	n
TA4.4.n	List of techniques and their usefulness (or not) in certain classes of problems; $n=6,12,\ldots,36$	n
TA4.5.n	Sponsorship of Best Application Development prizes in Cognitive Vision Systems; $n=12,\ldots,36$	n
SA1.1	CSCW infrastructure operational	3
SA1.2	Website core structure implemented	3
SA2.1.n	Periodic management report; n = 6, 12,, 36	n
SA2.2	Final report from ECVision	36





### Research Planning

TA1.1.n	Workshop proceeding/report; n = 6, 12,, 36
TA1.2.n	Position paper; n= 6, <b>12</b> , , 36
TA1.3	Advances in computer vision (month 6)
TA1.4	Advances in artificial intelligence (month 6)
TA1.5.n	White paper on cognitive vision research; n = 6, 12,, 36
TA1.6	Benchmark applications
TA1.7.n	Research Roadmap; n = 6, 12,, 36
TA1.8.n	Database of European research; n = 6, 12,, 36







#### Education and Training

- TA2.1 Survey of existing courses on cognitive computer vision
- TA2.2 Web-based respository of existing courseware and/or course slides
- TA2.3 Web repository of MSc and PhD project proposals
- TA2.4 Model curriculum for cognitive computer vision
- TA2.5 Web-based encyclopedia of cognitive computer vision
- TA2.6 Web-based listings of available positions & people seeking positions
- TA2.7.n Annual Best Ph.D. prizes in Cognitive Vision Systems; n = 12, 24, 36
- TA2.8.n Annual summer school on Cognitive Vision Systems; n = 7, 19, 31
- TA2.9.n Organization of tutorials; n = 12, 24, 36
- TA2.10.n Identification of common development environments; n = 12, 24, 36
- TA2.11.n Contribution of code to the VXL and/or OpenCV; n = 12, 24, 36
- TA2.12.n Short-term exchange/visits of research staff; n = 12, 24, 36
- TA2.13.n Short-term exchange/visits of post-graduate students; n=12, 24, 36
- TA2.14 Textbook on cognitive computer vision







#### Information Dissemination

- TA3.1.n Electronic newsletter, published quarterly; n = 3, 6, ..., 36
- TA3.2.n Database of existing relevant publications; n = 6, 12, ..., 36
- TA3.3.n Annotated bibliography of literature; n = 6, 12, ..., 36
- TA3.4.n Database of research results; n = 12, 24, ..., 36
- TA3.5.n Periodic distribution of web-site content on CD; n = 12, 24, 36
- TA3.6.n Special sessions at conferences; n = 12, 24, 36
- TA3.7.n Sponsorship of best paper prizes in cognitive vision; n = 12, 24, 36
- TA3.8.n Thematic workshops; n = **12**, 24, 36
- TA3.9.n Special issues in journals; n = 12, 24, 36
- TA3.10.n Focussed review papers in journals; n = 12, 24, 36







#### Industrial Liaison

- TA4.1.n Database of research profiles and application experience, indexed by application, R&D topics, industrial sector; n = 12, 24, 36
- TA4.2.n Directory of vision vendors, indexed by application, product type, deployed technology, industrial sector; n = 6, 12, ..., 36
- TA4.3.n Database of application-motivated R&D problems and information on successful and unsuccessful approaches to solutions; n=6, 12, ... 36
- TA4.4.n List of techniques and their usefulness in certain classes of problems; n = 6, 12, ..., 36
- TA4.5.n Sponsorship of Best Application Development prizes in Cognitive Vision Systems; n = 12, ..., 36







#### Information Infrastructure

SA1.1 CSCW Infrastructure operations

SA1.2 Website core structure implemented

#### Management

SA2.1.n Periodic management report; n = 6, 12, ..., 36

SA2.2 Final report on ECVision (due month 36)







# Highlights



## Research Roadmap



### A Research Roadmap of Cognitive Vision

David Vernon (Ed.)

ECVision: The European Research Network for Cognitive Computer Vision Systems

IST Project IST-2001-35454

website: www.ecvision.org email: coordinator@ecvision.org

Version 4.1

February 7, 2005



## A Research Roadmap of Cognitive Vision

Peter Auer
Isabelle Bloch
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Patrick Courtney
Sven Dickinson
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Goesta Granlund
Walter Kropatsch
Giorgio Metta
Bernd Neumann
Axel Pinz
Giulio Sandini
Gerald Sommer
David Vernon

Aude Billard
Pia Boettcher
Henrik Christensen
Andrew Crookell
Christof Eberst
Wolfgang Förstner
Vaclav Hlavac
Ales Leonardis
Hans-Hellmut Nagel
Heinrich Niemann
Fiora Pirri
Bernt Schiele
John Tsotsos
Markus Vincze

Horst Bischof
Heinrich Bülthoff
Tony Cohn
James Crowley
Jan-Olof Eklundh
John Gilby
Josef Kittler
Jim Little
Bernhard Nebel
Lucas Paletta
Gerhard Sagerer
Rebecca Simpson
Monique Thonnat

ECVision: The European Research Network for Cognitive Computer Vision Systems

IST Project IST-2001-35454

website: www.ecvision.org email: coordinator@ecvision.org

Version 4.2

February 11, 2005

### Summer Schools (2003, 2004, 2005?)



### > Institute of Photogrammetry Bonn



Home Institute Notices Teaching Staff Projects **Publications** Events Links local



European Research Network for Cognitive Computer Vision Systems

### Second Summerschool Cognitive Vision

Bonn, Germany Monday 16. - Friday 20. August 2004 General Information and Registration

Chair

Prof. Dr.-Ing. W. Förstner

## Model Syllabus



### Cognitive Vision Model Syllabus

#### Introduction

This is a syllabus resource for Cognitive Computer Vision, such as might be taught in a comprehensive course on Cognitive Computer Vision. Recognising that what might actually be taught is a subset of this material, we have tried to structure this as a resource, meaning that the given topics are recommended, but the choice of topics for any particular course is up to the lecturer. This is a different resource from the Cognitive Computer Vision Ontology which tries to lay out a view of the structure of Cognitive Computer Vision.

There are many technologies that could have been included, but we are proposing those that we thought had the greatest value for Cognitive Vision systems, and are likely to be the foundation for the summer school course and textbook. This is not a hierarchy, nor are the topics mutually exclusive.

We have tried to identify the central topics here and aimed at a typical full-year course with 54 lecture hours. We think that at a minimum, coverage of each of the five Cognitive Computer Vision subject areas should have an overview, one or more techniques and an example application.

We have tried to be mildly prescriptive about the order of topics, starting with the most important (in our estimation), but are not specifying the method of presentation, nor the depth, all of which will depend on the presenter's preferences and the amount of available time.

Some good general references are:

- 1. Forsyth and Ponce. Computer Vision: a modern approach. Prentice-hall, 2002.
- 2. Duda, Hart and Stork. Pattern Classification (2nd Edition). Wiley Interscience, 2000.

With ECVision funding, we are still working at: (1) identifying a key citation and (2) collecting online resources for each topic.

Basic prerequisite background knowledge:

# Cognitive Vision Ontology



### **Cognitive Computer Vision Ontology**

This is an evolving topic categorization for Cognitive Computer Vision, supported by the ECVision: European Research Network for Cognitive Computer Vision Systems. Perhaps 'ontology' is not the right word to describe it, as it isn't a hierarchical subtype tree. But it's not a glossary nor syllabus either. Perhaps it's a topic catalog? Please suggest a good descriptive noun.

People directly involved in its development are: Bob Fisher, Wolfgang Förstner, Annett Faber and Hanns-Florian Schuster.

- 1. Model Learning (Survey Result)
  - Specific approaches to learning these different types of content (See also <u>Knowledge Representation->Content</u> for "what" things that are learned and <u>Recognition</u>, <u>Categorization and Estimation->Specific Approaches</u> for "how" things might be recognized.)
    - 1. Activity/Behaviors/Processes/Dynamics
    - 2. Classification/Category
    - 3. Context/Scenes/Situations
    - 4. Function
    - 5. Objects/Parts
    - 6. Parameters
    - Task Control
  - 2. Issues
    - 1. Learning Control
    - Validation
  - 3. Types of Learning
    - 1. Case-based
    - 2. Reinforcement
    - Supervised
    - 4. Unsupervised
- Knowledge Representation (Survey Result)

### CVonline Educational Material

### CVonline: The Evolving, Distributed, Non-Proprietary, On-Line Compendium of Computer Vision



Editor: Robert B. Fisher
School of Informatics
University of Edinburgh
CVonline URL: http://homepages.inf.ed.ac.uk/rbf/CVonline/

#### **Background information**

- · An overview of CV online.
- · Advice on how to cite topics.

#### **Compendium Contents**

The unfolded list of topics.

The folded subject hierarchy:

- 1. Applications
- 2. Vision Related Books including Online Books and Book Support Sites
- 3. Databases and Indexing
- 4 T IF C

## Annotated Bibliography

(485 entries and counting)



### European Research Network for Cognitive Computer Vision Systems

Information About ECVision Members News Contacts Research Planning Education and Training Industrial Liaison Home

Current page: Information->Indexed and Annotated Bibliography

#### ECVision indexed and annotated bibliography of cognitive computer vision publications

This bibliography was created by <u>Hilary Buxton</u> as part of ECVision Specific Action <u>8-1</u>. The complete text version of this BibTeX file is available here: <u>ECVision bibliography.bib</u>

#### ALTERNATIVE INDEX

Storage

```
Case Studies
   Bakstein2001 Bishop00a Koffka35a Nakayama90a riesenhuber00
   Hjelmas01 Gerstner: 95 Maes: 96 Granlund99 Edelman2002
   Nagel2003 CaelliBishof1996
Energing Topics
   Vision and Language Fusion
     Roy1999 Nagel 2001 Duygulu02 Gerber-Nagel: 96 Turk: 96
      Wachsmuth2002-BNF Nogawa1997 Edelman1994 SocherSagerer2000 Christmas2003
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     Activities/Behaviours/Processes/Dynamics
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     Classes/Categories
        Edelman1999
     Contexts/Scenes/Situations
        Chun98a
     Objects/Parts
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     Parameters
        Finlayson1998
     Task Control
        YeTsotsos2001
   Issues
     Indexing
        Bremond: 98
```

## White Paper on Industrial Applications



# ECVision White paper on industrial applications of cognitive vision

Authors: Patrick Courtney, Pia Böttcher

Date: 23. April 2003

Version: 1.2

## Application Prize



### European Research Network for Cognitive Computer Vision Systems

Information About ECVision Members News Contacts Research Planning Education and Training Industrial Liaison Home

Current page: Industrial Liaison->Application Prize

#### ECVision Prize for Best Application Development in Cognitive Vision Systems

ECVision has sponsored a competition to identify the company that has best adopted the cognitive vision philosophy of adaptive learning in its products. This prize was awarded in May 2003 to Inx Systems Corp., Finland for its Optigrader on-line volume and quality measurement timber inspection system. The Optigrader uses self-organizing feature maps to effect learning via supervised training to yield a parameter-less classification / inspection system.

According to the winner, "The OptiGrader system is fully automatic and the grading processes do not require special staff. The production process with measurement, optimizing and grading is reliable and the sawmill do not require special technical staff to keep the system up and running, because there are no special parameters to adjust and the whole unit do not need any special service".

For more details, see the Inx Systems Website.



## Dagstuhl Workshop



SCHLOSS DAGSTUHL
INTERNATIONAL
CONFERENCE AND
RESEARCH CENTER
FOR COMPUTER SCIENCE

#### Dagstuhl Seminar 03441

Home Page / Dagstuhl-Seminars / 03 / 03441

Copyright

26.10.-31.10.2003, Seminar Nº 03441

#### **Cognitive Vision Systems**

H. Christensen (Stockholm, S), H.-H. Nagel (Univ. Karlsruhe, D)

#### **Seminar Data**

- List of participants with talks + materials
- <u>List of participants with adresses</u>
  From outside of Dagstuhl this list is only accessible via anonymous login. Use "anonymous" as user id and your e-mail address as password. (Works similar to anonymous ftp.)
- Seminar Participants Group Picture
- Seminar Report

# Dagstuhl Workshop



## Software Frameworks Report

### Technical Report for Special Action 13-2 Overview of Software Frameworks for Use in Cognitive Vision Approaches

Wolfgang Ponweiser and Markus Vincze

Automation and Control Institute, Vienna University of Technology, Gusshausstrasse 27-29 / E376, 1040 Wien, Austria {ponweiser,vincze}@acin.tuwien.ac.at Sebastian Wrede and Christian Bauckhage

Applied Computer Science,
Faculty of Technology, Bielefeld University,
P.O. Box 100131, 33501 Bielefeld, Germany
{swrede,cbauckha}@techfak.uni-bielefeld.de

January, 2005

## 28 Specific Actions



### European Research Network for Cognitive Computer Vision Systems

Information About ECVision Members News Contacts Research Planning Education and Training Industrial Liaison Home

Current page: Information->Specific Actions->Specific Action Status

#### SPECIFIC ACTION STATUS

Specific Action 1-1: Best Paper Prize in Cognitive Vision at ECCV'02

Specific Action 2-1: 1st Summer School in Cognitive Computer vision 2003

Specific Action 2-2: 2nd Summer School in Cognitive Computer vision 2004

Specific Action 6-1: Cognitive Vision Education Survey

Specific Action 6-2: Restructuring of CVOnline

Specific Action 6-3: Encyclopedia Cognitive Computer vision

Specific Action 6-4: Education / Online Books

Specific Action 7-1: White Paper on Applications of Cognitive Vision Systems

Specific Action 7-2: Prize for Best Application Development in Cognitive Vision Systems

<u> Specific Action 7-3: Industrial Activity - Project Liaison</u>

Specific Action 7-4: IST Conference - ECVision Organization of Cognitive Systems Events

Specific Action 8-1: Keyword Indexed Bibliography with Abstracts of Papers

Specific Action 8-2: ECCV 2004 Workshop on "Real-World Issues in Animate Vision"

Specific Action 8-3: Probabilistic Graphical Models for Cognitive Computer Vision

<u> Specific Action 12-1: Staff/Student Exchange - University of Oxford and Graz University of Technology</u>

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

Specific Action 13-2: Overview of software Frameworks for Use in Cognitive Vision Approaches

Specific Action 13-3: Staff/Student Exchange - Vienna University of Technology

Specific Action 16-1: Staff/Student Exchange - University of Bielefeld and University of Surrey

Specific Action 16-2: Staff/Student Exchange - University of Bielefeld and University of Surrey

Specific Action 21-1: Cognitive Computer Vision Ontology Development

Specific Action 21-2: Imprecise Knowledge Representations in Cognitive Vision

Specific Action 25-1: CVPR 2004 Workshop on Generic Object Recognition and Categorization

Specific Action 33-1: ECCV 2004 Workshop on Statistical Learning for Computer Vision

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

Specific Action 37-2: WAPCV 2004 - Workshop on Attention and Performance in Computer Vision

## The Membership!

(50 Institutions & 63 Individuals)



### European Research Network for Cognitive Computer Vision Systems

Information About ECVision Members News Contacts Research Planning Education and Training Industrial Liaison Home

Current page: Members->List of Members

To send email to all members of ECVision, send your message to: EveryMember@lists.ecvision.org

Note that, to prevent irrelevant or spurious messages, emails to this list are moderated by the network coordinator and are restricted to members of ECVision.

Alternatively, you can contact each member individually:

Auer,	Peter	University of Leoben	auer@unileoben.ac.at	MORE DETAILS
Bischof,	Horst	Graz University of Technology	bischof@icq.tu-graz.ac.at	MORE DETAILS
Blake,	Andrew	University of Oxford & Microsoft Research		MORE DETAILS
Brady,	Mike	University of Oxford	<u>imb@robots.ox.ac.uk</u>	MORE DETAILS
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Ferryman,	James	University of Reading	j.m.ferryman@reading.ac.uk	MORE DETAILS





## Status of Budget







# ECVision is dead Long Live ECVision







- Website will continue to be maintained
- 3rd ECVision Summer-school in Bonn August 2005
- International Cognitive Vision Workshop (ICVW 2006) at ECCV 2006 in Graz





Information	About ECVision	Members	News	Contacts	Research Planning	Education	and Training	Industrial Liaison	Home
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