euCognition

www.euCognition.org

European Network for the Advancement of Artificial Cognitive Systems

Project IST-026408

Cogsys
Cognitive Systems.eu

Instrument: Coordination Action
Thematic Priority: IST – Cognitive Systems

Third Periodic Activity Report

Months 25-36

Period covered from **01/01/2008** to **31/12/2008**   Date of preparation: **5/12/2008**

Start date of project: **01/01/2006**   Duration: **36 months**

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Project coordinator organization name: **University of Genova**
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Revision: **1.0 DRAFT**

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Executive Summary

Project Summary

The principal goal of the euCognition network is to advance the emerging area of artificial cognitive systems by fostering inter-disciplinary interaction, spanning a greater spectrum of people, perspectives, and applications than is possible in a single R&D project.   It aims to leverage added value from existing work through interaction and to use this to encourage further contributions from new participants. A key objective of the network is to foster interaction between all the many different scientific sectors involved in this multi-disciplinary area and to help create truly inter-disciplinary perspectives.

The activities of the network cover four key concerns:

- (a)   Outreach
- (b)   Scientific Outlook
- (c)   Education
- (d)   On-line Resources for the Community

euCognition strives to support the research community that is already involved in FP6 & FP7 projects in cognitive systems and to help other individuals from research institutes and companies become involved in this initiative. This is achieved by facilitating interaction between projects and collaboration between individuals on a variety of fronts, ranging from workshops, conferences, courses, exchanges of staff and students, development & dissemination of training material, access to development platforms, research planning, and the creation of an extensive dynamic web-based repository of resources for the greater community.

Summary of Work Performed

The following are a selection of highlights of the results achieved by the network over the past year.

1. Membership outstripped targets: 376 members (the target for 3 years was 120).
2. 4th Six-monthly meeting, Venice, January 2008.
3. 5th Six-monthly meeting, Munich, June 2008.
4. Approval of 28 new Network Actions, bringing the total to 83.
5. Significant take-up of the designated Official euCognition Event programme.
6. Creation of 51 Cognition Briefings, bringing the total to 80.
7. Significantly increased number of hits on euCognition website and wiki.

Section 1 – Project objectives and major achievements during the reporting period

Objectives and Achievements for the Current Period

Our principal goals for the third year of operation of the network were:

1. Develop euCognition website resources
2. Organize three six-monthly meetings
3. Launch initiatives to encourage the involvement of members
4. Grow the membership, with a focus on seeking new members from diverse backgrounds and especially seeking to involve those who have not been involved so far in CogSys-funded projects.
5. Develop an initiative to create a euCognition Research Roadmap.

As will be evident from the following, most these objectives have been met.

Membership has grown beyond our expectations. We originally planned on having 120 members by the end of the three-year contract period. This number was passed after just six months and there were over 260 members by the end of 2007, and 376 at time of writing (see http://www.eucognition.org/members.htm). Significantly, more than 66% of the members are not involved in CogSys-funded projects, up from 60% in 2007, and 50% in 2006. Members are drawn from a wide variety of research background. Over 100 of the members are students (or were students when they joined; some have since been promoted to full membership).

Both the 4th and 5th six-monthly meetings in Venice and Munich, respectively, were well-attended, typically with between 90 and 100 attendees on average. Unfortunately, the 6th and final six-monthly meeting in Venice had to be cancelled due to a shortage of funds. This shortage arose for a number of reasons, the principal ones being that in mid-2008 members began to submit claims for undeclared costs that they incurred in Years 1 and 2, both in attending meetings and in network actions, and the number of members opting to request reimbursement of costs for attending official euCognition events increased dramatically.

The network action programme is proving increasingly popular and 28 actions were approved in 2008 with a total value of €216k, compared with 29 actions in 2007 with a total value of €201k, and 26 actions and €223k in 2006. Of the total of 83 actions, 31 fall under the heading of Outreach, 39 under the heading of Scientific Outlook, and 13 under the heading of Education. The figure for 2006 includes an extraordinary amount of €125k for Network Action 007-1 which was devoted to developing the research roadmap and which was subsequently revised downward to a much smaller figure on the order of €10k.

The designated official euCognition events programme has proved to be an outstanding success ; too successful, in fact, as it ultimately causes financial problems for the network with an unexpectedly high take-up.

The website and an associated wiki are operational; statistics on access to each page are provided but it is noteworthy that the top 10 website resources are receiving between 1700 and 4900 hits per year while the top 10 Wiki pages are receiving between 900 and 12000 hits per year; even pages ranked 100 on the website and wiki receive on the order of 400 and 100 hits per year, respectively.

The number of Cognition Briefings, accessible introductions to particular topics in cognitive systems, have grown considerably from 7 in 2006 to 29 in 2007 and there are currently 80 briefings.

After considerable effort trying to move the euCognition Roadmap forward, it was finally acknowledged that the challenge of creating a research roadmap was much greater than had first been thought, in terms of scope, complexity, and the effort required to complete it. Consequently, in March 2007 it was decided to re-scope it and an alternative plan – dubbed the Learning Journey - was adopted. To boot-strap this process, members of the Executive Committee volunteered to organize a series of workshops over the final period of the project. It remains to bring these together in some coherent whole. The failure to complete this goal in any meaningful way is the single disappointing outcome of the project, albeit an understandable and arguably an inevitable one.

Section 2 – Workpackage progress of the period

Before proceeding to walk through the progress that has been achieved in each work-package towards the respective deliverables, it is worth remarking that the deliverables of the euCognition project are unusual in that they are not itemized products but are rather the components of the euCognition website, populated by the outcomes of network actions. The website therefore plays a pivotal role in euCognition as it is the primary means by with the activities of the network are documented and assessed. We return to this issue under WP 4 – On-line Resources.

Network actions are the primary mechanism by which members of the network can receive modest funding for relevant tasks that contribute to the work of the network. These tasks cannot involve research (since this is prohibited by a Coordination Action contract) but can facilitate the creation of educational material, visits by staff and students, workshops, and making research resources available to members. A complete of the Network Actions undertaken can be found on the website:

<div align="center">

http://www.eucognition.org/network_actions_funded.htm

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The are also listed below, year by year, ordered by workpackage number (WP1: Outreach; WP2: Scientific Outlook; WP3: Education).

The Network Actions programme had to be discontinued in August 2008 due to lack of funds.

euCognition Network Actions 2006

Accepted	Proposer	Budget	Claimed	WP
NA 002-1 Student Support for the Inaugural Meeting	Fred Cummins	8000	8000	1
NA 004-1 Student Visit to the SCAI Lab, University of Skövde	Tom Ziemke	5900	1663	1
NA 004-2 Student Visit to the SCAI Lab, University of Skövde	Tom Ziemke	6875		1
NA 062-1 Staff Visit to University of Rome 'La Sapienza'	Barbara Caputo	1000	0	1
NA 097-2 Student visit to the University of Genoa	Angelo Cangelosi	4300	4180	1
NA 108-1 Staff Visit to the University of Genoa	Cecilio Angulo	1500	1500	1
NA 133-1 Student Visit to the Max Planck Institute, Leipzig	Stefano Nolfi	2700	1301	1
NA 007-1 Application & research roadmap for artificial cognitive systems	Bill Sharpe	125390	9355	2
NA 010-1 Workshop on Information Theory, Neurobiology and Cognition	Juergen Jost	3000	3004	2
NA 017-1 Symposium on Grand Challenge: Architecture of Brain and Mind	Aaron Sloman	10610	8818	2
NA 026-1 Workshop on Abstraction and Context in Cognitive Systems	Walter Kropatsch	2500	0	2
NA 028-1 9th Int. Conference on the Simulation of Adaptive Behavior	Jean-Arcady Meyer	5000	6221	2
NA 044-1 Action Selection for Intelligent Systems	Joanna Bryson	1150	1240	2
NA 050-1 Workshop on Embodying Cognition	Antoni Gomila	2000	1997	2
NA 066-1 CD Proceedings of ABiALS 2006	Gianluca Baldassarre	700	632	2
NA 089-1 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta	3200	0	2
NA 092-1 6th Czech-Slovak workshop on Cognition and Artificial Life	Jiri Wiedermann	3000	0	2
NA 097-1 External Symbol Grounding Workshop 2006 (ESG2006)	Angelo Cangelosi	4800	2724	2
NA 126-1 Workshop on Modelling Cognitive and Biological Autonomy	Alvaro Morena	4100	4097	2
NA 141-1 Symposium on Imitation in Animals and Artifacts	Manuel Lopes	4200	2581	2
NA 178-1 Int. Conference on Development and Learning (IEEE ICDL 2007)	Yiannis Dimiris	0	0	2
NA 011-1 5th European Neuro-IT and Neuroengineering School	Andreas Engel	10025	10025	3
NA 047-1 Summer School on Humanoid Robots	Giorgio Metta	2790	913	3
NA 068-1 Neurophysiology and Psychophysics material for CVOnline	Robert Fisher	4000	4000	3
NA 068-2 Optically scan five cognitive vision books for CVOnline	Robert Fisher	4000	4000	3
NA 105-1 Connect with AI: cognitive robot education outreach initiative	Sethu Vijayakumar	3120	3120	3
Overall Total		**223860**	**79371**	
Total outstanding			**6875**	

Declined

NA024-1 Scan Paths	Stavri Nikolov
NA068-3 Pattern Recognition Materials	Robert Fisher
NA113-1 Website Tools	Sabine Ploux

In 2006, twenty-nine network action proposals were submitted to the Executive Committee for consideration. Of these, twenty-six were supported and subsequently approved by the Commission. Three were declined.   The total budget of those supported was €223,860

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euCognition Network Actions 2007

Accepted	Proposer	Budget	Claimed	WP
NA004-3 Student Visit to University of Skovde	Tom Ziemke	5250	5677	1
NA009-1 Staff Visit	Peter Ford Dominey	600	552	1
NA030-1 Student Visit to University of Tokyo	Giulio Sandini	4800	4800	1
NA044-3 Book and Webpage	Joanna Bryson	36000		1
NA062-2 Staff visit to IDIAP	Barbara Caputo	7280	0	1
NA083-1 Staff Visit	Carlos Herrera	1800		1
NA097-2 Student visit to the University of Genoa	Angelo Cangelosi	4300	4180	1
NA097-3 Student visit to the University of Plymouth	Angelo Cangelosi	5300	5175	1
NA097-4 Student visit to the University of Genoa	Angelo Cangelosi	3200	2884	1
NA119-1 Staff Visit to the University of York	Giovanni Pezzulo	4400	4386	1
NA149-1 Student Visit to University of Oxford	Pau Baiget	1800		1
NA225-1 Industry Forum	Erich Rome	18000	10308	1
NA012-1 ACM/IEEE Human-Robot Interaction Conference 2008	Matthias Scheutz	17000	0	2
NA023-1 Workshop on object categorization	Ales Leonardis	4000	4000	2
NA024-2 Scan Paths: Eye Movement Data Sets	Stavri Nikolov	3740		2
NA032-1 ICVS 07	Antonios Gasteratos	4350	2221	2
NA089-1 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta	2800	0	2
NA098-1 Symposium on Language and Robots 2007	Tony Belpaeme	3100	5825	2
NA130-1 Workshop on Models of Thought	Brendan Wallace	2474	9209	2
NA161-1 The 7th Int. Conf. on Epigenetic Robotics	Christopher Prince	12000	6327	2
NA173-1 Naturalized Epistemology Workshop	Marcin Milkowski	2000	2345	2
NA177-1 Int. Conference on Affective Computing and Intelligent Interaction	Lola Canamero	6000	8559	2
NA179-1 Workshop on natural and artificial intelligence	Alex Kacelnik	9400	6056	2
NA193-1 Workshop on social learning in embodied agents	Davide Marocco	2600	2273	2
NA205-1 Workshop on Dynamical Approaches to Development	Rachel Wood	8652	2014	2
NA217-1 Workshop on Enactive Approaches to Social Cognition	Steve Torrance	3000	2895	2
NA044-4 Curriculum	Joanna Bryson	19000		3
NA068-4 Collection of educational materials for machine learning	Robert Fisher	5250	3200	3
NA094-1 Cognitive robotics: from laboratory to media	Catalin Buiu	2700	2235	3
Overall Total		**200796**	**95121**	
Total outstanding			**62340**	

Declined

NA066-2 Humanoid Robot	G. Baldassarre
NA045-1 Presentation to PPSRC	Patrick Courtney
NA190-1 Czech and Slovak Cognitive Web Portal	Radovan Sikl
NA183-1 Workshop on Analogies: Integrating Multiple Cognitive Abilities	Angela Schwering
NA045-2 Workshop on Benchmarks	Patrick Courtney
NA044-2 euCognition Outreach through Book and HE Curriculum	Joanna Bryson

In 2007, thirty-five proposals were submitted, twenty-nine were supported and approved. Six were declined. The total budget of those supported was €220796. Three actions were designated official euCognition events. These are NA098-1, NA130-1, and NA217-1.

euCognition Network Actions 2008

Accepted	Proposer	Budget	Claimed	WP
NA004-4 Student Visit	Tom Ziemke	500	406	1
NA018-1 Student Visit	Ricardo Sanz	4870	4495	1
NA045-3 EU Cognitive Systems projects at NIST IPerMis Conference	Patrick Courtney	15000	9240	1
NA047-2 Dissemination of results at the Automatica 2008 trade fair	Giorgio Metta	2500	649	1
NA081-1 Student Visit	Jordi Gonzalez	1000	0	1
NA083-2 Staff Visit	Carlos Herrera	1700		1
NA097-5 Student Visit	Angelo Cangelosi	5000		1
NA097-6 Staff Visit to the University of Plymouth	Angelo Cangelosi	2500		1
NA120-1 Student Visit to SCAI Lab	Anthony Morse	5750	5563	1
NA146-1 Staff Visit	Xabier Barandarian	6750		1
NA243-1 Staff Visit	Francesco Orabona	850	840	1
NA304-1 Staff Visit	Roman Borisyuk	6300		1
NA004-5 Workshop on Emotion	Tom Ziemke	7500	3617	2
NA011-2 9th International Multisensory Research Forum 2008	Andreas Engel	10000	9320	2
NA057-1 Workshop on Dynamic Field Theory	Wolfram Erlhagen	3000	2424	2
NA065-1 CogSys 2008	Tamim Asfour	30000	2532	2
NA089-2 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta	2000		2
NA119-2 ABiALS 2008	Giovanni Pezzulo	5000	4027	2
NA159-1 Pascal Workshop on Modelling Cognitive Behaviour	Nello Christianini	0	0	2
NA198-1 Official Event: Int. School on Multimodal Signals	Anna Esposito	10000	1818	2
NA219-1 Workshop on adaptive mechanisms of the perception-action cycle	Vassilis Cutsuridis	5400		2
NA224-1 EpiGenetic Robotics 2008	Luc Berthouze	9000	5818	2
NA297-1 Workshop on International Robot Learning	Danijel Skocaj	3300	2015	2
NA047-3 Cognitive Robotics Summer School	Giorgio Metta	10250	5510	3
NA073-1 NL Dynamics and Robotics Summer School	Paolo Arena	5000	853	3
NA140-1 Barcelona cognition, brain and technology summer school	Paul Verschure	47,800		3
NA220-1 Doctoral Consortium	Samia Nefti	4500	1332	3
NA240-5 Summer Institute on Social Cognition	Stevan Harnad	11,200	7,723	3
Overall Total		**216670**	**68182**	
Total outstanding			**72,050**	

Declined				
NA 193-2 Student Visit	Marocco	6000		
NA289-1 Robotdalen Prize	Peter Wide	4500		

In 2008, thirty proposals were submitted, twenty-eight were supported and approved. Two were declined. The total budget of those supported was €216670. Nine actions were designated official euCognition events. These are NA004-5, NA057-1, NA073-1, NA119-2, NA159-1, NA198-1, NA219-1, NA220-1, NA224-1.

WP1 – Outreach

Workpackage objectives

The Outreach activity embraces both inter-project collaboration and the involvement of new blood from academia and industry. It includes initiatives for bi-lateral exchanges, particularly focusing on individuals, institutes, and companies that are not yet directly involved with funded projects, and providing where necessary the resources for new pilot initiatives (e.g. providing access to platforms for experimental work in embodied cognition).

Progress towards objectives

Membership

The membership of euCognition has grown steadily throughout the three years of the project. By the end of 2006, it had exceeded 180 members, sixty more than the original 3-year target. By the end of 2007, there were 262 members, over double the 3-year target. The network currently has 376 members, triple the original target.

At the end of 2006, 39 of the members were student members. At the end of 2007, 58 of the members were students. There are now 104 student members, nearly a third of the total.

66% of the members are not associated with an on-going Cognitive Systems project, a increase of the percentage of 61% in 2207, and 50% in 2006. This clearly demonstrates that we have succeeded well in our efforts to involve new people in the community.

The full list of members and their contact details can be found on the website at:

http://www.eucognition.org/members.htm

A list of the research areas cited by members in their membership applications can be found on the website at:

http://www.eucognition.org/members_research_areas.htm

Over 270 distinct areas are cited. Although there is some overlap among many of the areas, this list nevertheless shows the true diversity of euCognition members.

Cognition Briefings

In year 1, a special initiative was launched to create a new resource for the community in an effort to help bridge the gap between the many disparate communities involved in the cognitive systems research and in the process to reach out to a broader audience. This resource takes the form of the euCognition

Cognition Briefings, short articles written for a non-specialist audience. They aim to provide a quick and accessible introduction to a particular topic in cognitive systems with references or links for further reading. They are inspired by the [Brain Briefings](#) of the American Society for Neuroscience.

At the end of 2006, members have contributed only seven briefings. By the end of 2007, there were 29 briefings. There are now 80 briefings and the number continues to rise. There are three reasons for this increase. First, at the end of 2006 it was decided that every new Network Action should contribute at least one briefing to the wiki on the topic of the action. Second, Fred Cummins in his capacity as responsible for Outreach pursued a campaign to solicit briefings from each member individually. Third, it was made a condition that any member claiming travel expenses to attend an official euCognition event must contribute a briefing.

Although the cognition briefing initiative has been successful, it should also be noted that no editorial control is exercised at present. We depend on the members themselves to police the quality of the material posted on the Wiki. Inevitably, there is some variance in the quality of presentation and content. Furthermore, now that the number of briefing has reached a critical mass, there is also a need for some form of indexing and content classification.

Cognition Briefings

ACT-R
Affordances: The review of an inspiring notion
Anticipation and anticipatory behavior
Anticipatory eye-movements in infants
Appraisal
Attachment Theory and Artificial Cognitive Systems (pdf)
Autonomy and Cognition
Automatic and Willed Control of Action
Bayesian Multisensory Perception (pdf)
Bayesian Probabilistic Learning in Robots
Biomimetic Robotics
Bounded Online Learning with Kernel-Based Perceptrons
Cellular Nonlinear Networks
CoEvolutionary Approaches in Cognitive Robotic System Design
Cognitive and Affective Underpinnings of Risk Attitude
Cognitive Architectures
Cognitive Robotics
Cognitivism
Comparing Emotion Models Used in Agent Architectures
Computational Attention: a Key for Artificial Intelligence
Computationalism
Cross-situational algorithms for vocabulary learning
Distributed Intelligence for Smart Assistive Appliances
Dynamical approaches to development
Enactive approaches to social cognition
Enactive concepts
Extended Cognition: On the boundaries of cognitive systems
Eyes-Neck motor coordination through coupled chaotic systems
Facial Motion Analysis for Human Expression Interpretation
From Image Sequences to Natural-Language Texts
The Haken-Kelso-Bunz Model of the Coordination Dynamics of Two Hands
How can robots help us to understand biological systems? A look at odor localization in the male moth.
Homeostasis, Emotion, Cognition
Human Behavior Interpretation from Image Sequences
Human concepts - a matter of ontology or epistemology?
The Integration of Action and Language in Natural and Artificial Cognitive Systems
Ikaros
Interactive Robot Learning
Language and cognitive robots
Learning and Memory in Neural Networks
Level of Detail AI for Computer Games
Long Term Temporal Dependencies in Recurrent Neural Networks
Modelling cultural transmission and evolution: some references
Modeling of mind in real-time
Morphofunctional Machines and Emotion
Multisensory Processing
Naturalized Epistemology and Artificial Cognitive Systems
Perceptual Crossing: A minimalist approach to social interaction
Phenomenologist's view
Postcognitive psychology and affordance - a semiotic synthesis
Reclaiming Symbols
Redundancy in Action
Representation: A problematic but unavoidable concept
Representation: The Future of AI Without It
Reservoir Systems
RCS: an engineering Cognitive Architecture
Schemas and Schema-based Architectures
Simulating Speech Production and Speech Acquisition

The Cognition Briefings can be found on the euCognition wiki here

http://www.eucognition.org/wiki/index.php?title=Cognition_Briefings

Network Actions

In total, 31 actions have been funded under the heading of Outreach in 2006, 2007, and 2008. Most of these were for student visits and staff visits to help build link between labs. NA044-3 is large outreach action focusing on resources to inform and attract young people to the area (see http://www.cs.bath.ac.uk/cogsys/). NA255-1 focussed on the involvement of industry. NA045-3 involved the organization of a session at a forum in the USA to raise awareness of European cognitive systems research.

NA002-1 Student Support for the Inaugural Meeting	Fred Cummins
NA004-1 Student Visit to the SCAI Lab, University of Skövde	Tom Ziemke
NA004-2 Student Visit to the SCAI Lab, University of Skövde	Tom Ziemke
NA004-3 Student Visit to University of Skovde	Tom Ziemke
NA004-4 Student Visit	Tom Ziemke
NA009-1 Staff Visit	Peter Ford Dominey
NA018-1 Student Visit	Ricardo Sanz
NA030-1 Student Visit to University of Tokyo	Giulio Sandini
NA044-3 Book and Webpage	Joanna Bryson
NA045-3 EU Cognitive Systems projects at NIST IPerMis Conference	Patrick Courtney
NA047-2 Dissemination of results at the Automatica 2008 trade fair	Giorgio Metta
NA062-1 Staff Visit to University of Rome 'La Sapienza'	Barbara Caputo
NA062-2 Staff visit to IDIAP	Barbara Caputo
NA081-1 Student Visit	Jordi Gonzalez
NA083-1 Staff Visit	Carlos Herrera
NA083-2 Staff Visit	Carlos Herrera
NA097-2 Student visit to the University of Genoa	Angelo Cangelosi
NA097-2 Student visit to the University of Genoa	Angelo Cangelosi
NA097-3 Student visit to the University of Plymouth	Angelo Cangelosi
NA097-4 Student visit to the University of Genoa	Angelo Cangelosi
NA097-5 Student Visit	Angelo Cangelosi
NA097-6 Staff Visit to the University of Plymouth	Angelo Cangelosi
NA108-1 Staff Visit to the University of Genoa	Cecilio Angulo
NA119-1 Staff Visit to the University of York	Giovanni Pezzulo
NA120-1 Student Visit to SCAI Lab	Anthony Morse
NA133-1 Student Visit to the Max Planck Institute, Leipzig	Stefano Nolfi
NA146-1 Staff Visit	Xabier Barandarian
NA149-1 Student Visit to University of Oxford	Pau Baiget
NA225-1 Industry Forum	Erich Rome
NA243-1 Staff Visit	Francesco Orabona
NA304-1 Staff Visit	Roman Borisyuk

Please visit the website for more details on each of these actions and their outcomes:

http://www.eucognition.org/network_actions_funded.htm

Deviations from the project work-programme
None.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
1	Outreach online resources	1	36	36	DIST

List of milestones

None.

WP2 – Scientific Outlook

Workpackage objectives

The Scientific Outlook activity embraces research planning and technology-watch actions. A considerable amount of effort was devoted to refining and developing the characterization of cognition that forms the basis of the network at its inception and with a view to creating an ambitious but inclusive research agenda. The key focus of this activity is the cross-fertilization of ideas from many areas.

Progress towards objectives

Questionnaire

A questionnaire was launched at the end of the second half of 2006 to find out what workshops members would most like to attend. It also asked members to provide their definition of cognition and/or cognitive systems and to say what applications they felt best demonstrated the distinct characteristics of cognition.

The questionnaire can be found here

http://www.eucognition.org/questionnaire.htm

and the responses can be found here

http://www.eucognition.org/questionnaire_results.htm

Network Meetings

Six general meetings were held during the past three years:

1. Inaugural Meeting, Nice, 16-17 February 2006
2. First Six-Monthly Meeting, Vienna, 3 July 2006
3. Second Six-Monthly Meeting, Munich Airport, 11 & 12 January 2007
4. Third Six-Monthly Meeting, Munich Airport, 29 June 2007
5. Fourth Six-Monthly Meeting, Venice, 10 & 11 January 2008
6. Fifth Six-Monthly Meeting, Munich Airport, 27 June 2008

7. All the meetings were well-attended, typically with 90-100 attendees on average. A seventh meeting – the Sixth Six-Monthly Meeting – was scheduled to be held in Venice on the 28 & 29 November 2008. Unfortunately, this meeting had to be cancelled due to lack of funds.

The Inaugural Meeting (Nice, 16-17 February 2006) was something of a gala event, with tour de force presentations on a variety of topics being made by the four guest speakers, Liz Spelke, Scott Kelso, Jiri Wiedermann, and John Shawe-Taylor. Liz Spelke's and Scott Kelso's presentations topped the euCognition website list of most accessed pages for over two years. A DVD of the proceedings was also produced.

The First Six-Monthly Meeting (Munich, 2 July 2006) focused on the topic of navigation and the need for cognition and was addressed by four invited speakers: Robert Sutherland, Sidney Wiener, Hanspeter Mallot, and Jean-Arcady Meyer, Ulrich Nehmzow, and Paul Vershure.

The Second Meeting (Munich, 11-12 January 2007) was devoted to a discussion of the euCognition research roadmap, with several invited speakers providing perspectives of the Commission, Academia, and Industry. A student competition was also held on the day preceding the meeting, with two winners: Sanja Fidler and Armin Duff. Sanja's presentation is currently the third most accessed page on the euCognition website and the second most downloaded document (the most downloaded document is the white paper on action selection by Brom and Bryson; the most frequently accessed page is the list of members).

The Third Meeting (Munich, 29 June 2007) was devoted to the theme of Cognitive Architectures with the mid-term review of the network being held on the following day. The main meeting was addressed by five invited speakers: Joanna Bryson, Jeff Krichmar, Pete Redgrave, Murray Shanahan, and Jeremy Wyatt.

The Fourth Meeting (Venice, 10-11 January 2008) focused on the issue of Social Cognition, with guest presentations by Stevan Harnad, Luc Steels, Jordan Pollack, and Michael Arbib. The meeting began with a student competition, this time won by Tom Froese, University of Skövde.

The Fifth Meeting (Munich, 27 June 2008) addressed the topic of anticipation in cognition.and was addressed by four invited speakers: Bernard Hommel, Juergen Schmidhuber, Jun Tani, and Daniel Wolpert.

Unfortunately, the Sixth and final six-monthly meeting scheduled for 28 November 2008 in Venice had to be cancelled due to lack of funds.

Most presentations for each meeting are available on the euCognition website
http://www.eucognition.org/network_meetings.htm

euCognition Roadmap
One of the main goals of the euCognition network was to create a research roadmap that will help identify the functional and non-functional attributes of cognitive systems and focus attention on key scientific challenges in realizing them. Our philosophy for the roadmap is that it should be application-driven and capability led. A specific network action, NA007-1 led by Bill Sharpe, significant budget of €125k was launched to support this activity. The goals of the action were to develop an application and research Roadmap for artificial cognitive system and to engage industry sectors in the development of the roadmap so that it links the research agenda to potential applications and impact.

Plan A

Our original plan was to create the research roadmap in a variety of ways. Based on a canvass of the views of members of euCognition and staff in the EU Commission Cognition, Interaction, and Robotics unit, the Executive Committee agreed a specific Research Roadmap Agenda, including an exposition of the purpose of the roadmap, the approach to be used in developing it, the required outcomes, and an outline plan. Plan A is set out on the euCognition wiki page devoted to the Roadmap[1]. For convenience, we outline the proposed outline plan.

- January 2007: Roadmap Kick-off Meeting at the Second Six-Monthly Meeting
    - Invited industry & academic attendees
    - Identify people willing to contribute
    - Identify a small number of sectors to start process

    Based on participant feedback, the top three sectors that we intend to move ahead on are: *Humanoid robotics*, *Intelligent Transport*, and *Industrial Robotics*.

- Mar – June 2007
    - First scientific workshop to create first cut language for requirements and produce roadmap skeleton

- July 2007 onwards
    - First round of sector workshops to identify landmark applications
    - Bring together first round application and scientific work and organise next round of work

Plan B

In the immediate follow-up to the Roadmap Kick-off Meeting at the second six-monthly meeting in January 2007, it became clear that the challenge of creating a research roadmap was much greater than we had first thought, in terms of scope, complexity, and the effort required to complete the roadmap. These challenges are set out on the euCognition wiki.[2] Consequently, it was decided to rescope the goal and in March 2007 the Executive Committee adopted an Alternative Research Roadmap Agenda with a three-pronged approach, including interviews with key researchers, a series of debates, and a survey of all members of euCognition, as follows.

1. Conduct a series of interviews with key researchers to establish what they see as the key challenges facing them in their work and to identify any recent breakthroughs. These interviews

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[1] http://www.eucognition.org/wiki/index.php?title=Research_Roadmap_Plan_A
[2] http://www.eucognition.org/wiki/index.php?title=Challenge_of_Creating_a_Research_Roadmap

will be used as the basis of a catalogue of pressing research issues.

2. Organize a series of immersion days on selected topics. These will take the form of 'conversations' between two leaders in the field. These two people will have complementary positions on the topic in questions. The goal of the event will be to debate the issues underpinning the topic and try to tease out what it is we should be doing to make deepen the scientific foundations of the area and extend our current capabilities.

3. Conduct a survey of all members of euCognition, seeking answers to three questions:

   o What do we learn about human cognition from your work?
   o What new tools, capabilities, gadgets do you hope to develop in the next 5, 10, 20 years?
   o Why can't you build them now?

   These answers should be framed in a way that allows them to be understood by an educated non-specialist (e.g. a reader of New Scientist or Scientific American).

This three-pronged approach should be seen as a sort of middle ground between the conventional forward-chaining approach to road-mapping and backward-chaining approach favoured in the original Research Roadmap Agenda.

Plan B represented a shift in strategy, emphasizing less the development a full-blown roadmap and focusing more on a *Learning Journey*: a series of actions that support the evolution of the discipline through the sharing of viewpoints and increased interaction among the diverse set of stakeholders. To date Plan B be has not been put into effect.

Plan C

To bootstrap the Learning Journey process, members of the Executive Committee volunteered to organize a series of workshop over the remaining period of the project. The titles of these workshops are as follows.

- Extracting Requirements of a Cognitive Architecture from research in human cognitive development (Peter Ford Dominey)
- The Role of Information in Cognition (Jürgen Jost)
- Mechanisms of coordination in a cognitive system (Christoph von der Malsburg & Andreas Engel)
- Applications, Requirements, Capabilities (Patrick Courtney, Bill Sharpe, and Erik Hollnagel)
- Attention, Vision, Robotics, and Cognitive Systems (Markus Vincze)
- Affect and Emotion in Cognition (Tom Ziemke)
- Cognition and Culture: the enactive approach (Bill Sharpe & Fred Cummins)

Roadmap Wiki

Progress in developing the Roadmap is documented on the euCognition wiki here

http://www.eucognition.org/wiki/index.php?title=Research_Roadmap

Plan C workshops are all detailed on this wiki: the *mechanisms of coordination in a cognitive system* (Christoph von der Malsburg & Andreas Engel) was not held and the *Cognition and Culture: the enactive approach* workshop (Bill Sharpe & Fred Cummins) is scheduled for June 2009.

Network Actions

In total, 39 actions have been funded under the heading of Scientific Outlook in 2006, 2007, and 2008. Most of these were to support scientific workshops. A full list is shown below.

NA004-5 Workshop on Emotion	Tom Ziemke
NA007-1 Application & research roadmap for artificial cognitive systems	Bill Sharpe
NA010-1 Workshop on Information Theory, Neurobiology and Cognition	Juergen Jost
NA011-2 9th International Multisensory Research Forum 2008	Andreas Engel
NA012-1 ACM/IEEE Human-Robot Interaction Conference 2008	Matthias Scheutz
NA017-1 Symposium on Grand Challenge: Architecture of Brain and Mind	Aaron Sloman
NA023-1 Workshop on object categorization	Ales Leonardis
NA024-2 Scan Paths: Eye Movement Data Sets	Stavri Nikolov
NA026-1 Workshop on Abstraction and Context in Cognitive Systems	Walter Kropatsch
NA028-1 9th Int. Conference on the Simulation of Adaptive Behavior	Jean-Arcady Meyer
NA032-1 ICVS 07	Antonios Gasteratos
NA044-1 Action Selection for Intelligent Systems	Joanna Bryson
NA050-1 Workshop on Embodying Cognition	Antoni Gomila
NA057-1 Workshop on Dynamic Field Theory	Wolfram Erlhagen
NA065-1 CogSys 2008	Tamim Asfour
NA066-1 CD Proceedings of ABiALS 2006	Gianluca Baldassarre
NA089-1 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta
NA089-1 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta
NA089-2 Workshop on Attention in Cognitive Systems – WAPCV 2007	Lucas Paletta
NA092-1 6th Czech-Slovak workshop on Cognition and Artificial Life	Jiri Wiedermann
NA097-1 External Symbol Grounding Workshop 2006 (ESG2006)	Angelo Cangelosi
NA098-1 Symposium on Language and Robots 2007	Tony Belpaeme
NA119-2 ABiALS 2008	Giovanni Pezzulo
NA126-1 Workshop on Modelling Cognitive and Biological Autonomy	Alvaro Morena
NA130-1 Workshop on Models of Thought	Brendan Wallace
NA141-1 Symposium on Imitation in Animals and Artifacts	Manuel Lopes
NA159-1 Pascal Workshop on Modelling Cognitive Behaviour	Nello Christianini
NA161-1 The 7th Int. Conf. on Epigenetic Robotics	Christopher Prince
NA173-1 Naturalized Epistemology Workshop	Marcin Milkowski
NA177-1 Int. Conference on Affective Computing and Intelligent Interaction	Lola Canamero
NA178-1 Int. Conference on Development and Learning (IEEE ICDL 2007)	Yiannis Dimiris
NA179-1 Workshop on natural and artificial intelligence	Alex Kacelnik
NA193-1 Workshop on social learning in embodied agents	Davide Marocco
NA198-1 Official Event: Int. School on Multimodal Signals	Anna Esposito
NA205-1 Workshop on Dynamical Approaches to Development	Rachel Wood
NA217-1 Workshop on Enactive Approaches to Social Cognition	Steve Torrance

Please visit the website for more details on each of these actions and their outcomes:

http://www.eucognition.org/network_actions_funded.htm

Deviations from the project work-programme

None.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
2	Scientific outlook online resources	2	36	36	DIST

List of milestones

None.

WP3 – Education

Workpackage objectives

The Education activity is intended to help alleviate the significant difficulties posed by the multi-disciplinary nature of the area. The goal is to provide an effective mechanism to bridge gaps between sub-disciplines and help researchers in one area come up to speed in other areas. It is targeted both at research practitioners and graduate students. The activities will include the organization of summer schools (or, perhaps, the coordination of the efforts of the Integrated Projects in organizing summer schools) and the creation of teaching material.

Progress towards objectives

2008 saw the launch of 5 additional network actions on education, up from 2 in 2006 and 6 in 2007, resulting in a total of 13 in all. To date, we have supported 6 summer schools (NA011-1 and NA047-1, NA073-1, NA140-1, and NA240-1)) and contributed to the creation of several educational resources (NA068-1, NA068-2, NA068-4, NA094-1, and NA105-1). In addition, a major network action was launched at the end of 2007 to develop a curriculum on cognitive systems (NA047-4); see http://www.cs.bath.ac.uk/~cogsys/wiki/index.php/Main_Page. We also supported a doctoral consortium (NA220-1).

Network Actions

NA011-1 5th European Neuro-IT and Neuroengineering School	Andreas Engel
NA044-4 Curriculum	Joanna Bryson
NA047-1 Summer School on Humanoid Robots	Giorgio Metta
NA047-3 Cognitive Robotics Summer School	Giorgio Metta
NA068-1 Neurophysiology and Psychophysics material for CVOnline	Robert Fisher
NA068-2 Optically scan five cognitive vision books for CVOnline	Robert Fisher
NA068-4 Collection of educational materials for machine learning	Robert Fisher
NA073-1 NL Dynamics and Robotics Summer School	Paolo Arena
NA094-1 Cognitive robotics: from laboratory to media	Catalin Buiu
NA105-1 Connect with AI: cognitive robot education outreach initiative	Sethu Vijayakumar
NA140-1 BarceloNAcognition, brain and technology summer school	Paul Verschure
NA220-1 Doctoral Consortium	Samia Nefti
NA240-5 Summer Institute on Social Cognition	Stevan Harnad

Please visit the website for more details on each of these actions and their outcomes:

http://www.eucognition.org/network_actions_funded.htm

Deviations from the project work-programme

None.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
3	Education online resources	3	36	36	DIST

List of milestones

None.

Workpackage objectives

This work-package focuses on providing a dynamic web-based repository of material that will assist the cognitive systems community, in research, in education, and helping to make the relevance and importance of cognitive systems visible to the greater community.

Progress towards objectives

The euCognition Website can be accessed via both www.eucognition.org and www.eucognition.eu

The euCognition wiki can be accessed via http://www.eucognition.org/wiki/index.php?title=Main_Page

At present, we are running both main website and wiki in parallel to monitor the relative usage of each service. At some point in the future, we may consolidate these and opt for either one or the other delivery mechanism.

For easy reference on the current state of the website, a traversal of the menu system is listed on the following page with menus and sub-menus in bold and with menu items showing their respective URLs.

Traversal of the euCognition Website: http://www.eucognition.org

Home   http://www.eucognition.org/index.htm

More Info

    Membership

        List of Members   http://www.eucognition.org/members.htm
        Members Research Areas   http://www.eucognition.org/members_research_areas.htm
        Apply for Membership   http://www.eucognition.org/membership.htm

    Contact Details   http://www.eucognition.org/contacts.htm
    About euCognition   http://www.eucognition.org/about.htm
    Reimbursement of Costs   http://www.eucognition.org/costs.htm

    Network Actions

        Apply for a Network Action   http://www.eucognition.org/network_actions.htm
        Funded Network Actions   http://www.eucognition.org/network_actions_funded.htm

    Official Events   http://www.eucognition.org/official.htm

    Executive Committee   http://www.eucognition.org/exec.htm

    Meetings and Workshops

        Network Meetings   http://www.eucognition.org/network_meetings.htm
        Executive Committee Meetings http://www.eucognition.org/exec_meetings.htm
        Topical Workshops   http://www.eucognition.org/workshops.htm

    Useful Links

        ECVision   http://www.ecvision.org

        Cognition Unit

            Home Page   http://www.cordis.lu/ist/cognition/index.html
            Contacts   http://www.cordis.lu/ist/cognition/links.htm
            Events   http://www.cordis.lu/ist/cognition/events.htm
            Open Calls   http://www.cordis.lu/ist/cognition/calls.htm

        Exchange Rates

            Current rates   http://www.ecb.int/stats/exchange/eurofxref/html/index.en.html
            Past rates   http://europa.eu.int/eur-lex/lex/JOIndex.do?ihmlang=en

    Contract Documents   http://www.eucognition.org/contract_documents.htm
    Management Reports   http://www.eucognition.org/management_reports.htm
    Website Statistics   http://www.eucognition.org/website_statistics.htm
    euCognition Artwork   http://www.eucognition.org/logo.htm

News

    Announcements   http://www.eucognition.org/news.htm
    Official Events   http://www.eucognition.org/official.htm
    Jobs   http://www.eucognition.org/jobs.htm
    Open Student Positions http://www.eucognition.org/student_positions.htm

| Events and Calls | http://www.eucognition.org/events.htm |
| Partner Search | http://www.eucognition.org/partner_search.htm |

Outreach

euCognition Wiki	http://www.eucognition.org/wiki/
Definitions of Cognition	http://www.eucognition.org/wiki/index.php?title=Definitions_of_Cognition
Applications	http://www.eucognition.org/wiki/index.php?title=Applications_of_Cognitive_Systems
Exchanges and Visits	http://www.eucognition.org/exchanges.htm
Software Resources	http://www.eucognition.org/software_resources.htm

Outlook

euCognition Wiki	http://www.eucognition.org/wiki/
Exchanges and Visits	http://www.eucognition.org/exchanges.htm
Research Planning	http://www.eucognition.org/planning.htm
White Papers	http://www.eucognition.org/white_papers.htm
Proceedings and Abstracts	http://www.eucognition.org/proceedings.htm
General Articles	http://www.eucognition.org/general_articles.htm
Affect and Emotion Articles	http://www.eucognition.org/affect_emotion_articles.htm
Dynamical Systems Articles	http://www.eucognition.org/dynamical_systems_articles.htm
Cognitive Vision Articles	http://www.eucognition.org/cognitive_vision_articles.htm
Post-Cognitivist Psychology	http://www.eucognition.org/post-cognitivist_psychology.htm

Education

euCognition Wiki	http://www.eucognition.org/wiki/
Exchanges and Visits	http://www.eucognition.org/exchanges.htm
Summer Schools	http://www.eucognition.org/summer_schools.htm
Ph.D. and M.Sc. Dissertations	http://www.eucognition.org/dissertations.htm
Postgraduate Courses	http://www.eucognition.org/courses.htm

Traversal of the euCognition Wiki: http://www.eucognition.org/wiki/index.php?title=Main_Page

Research

| Research Roadmap | http://www.eucognition.org/wiki/index.php?title=Research_Roadmap |

Controversies in Cognitive Systems Research
http://www.eucognition.org/wiki/index.php?title=Controversies_in_Cognitive_Systems_Research

| Workshops | http://www.eucognition.org/wiki/index.php?title=Workshops |

Education

Model Curriculum	http://www.eucognition.org/wiki/index.php?title=Model_Curriculum
Course Material	http://www.eucognition.org/wiki/index.php?title=Course_Material
Student Forum	http://www.eucognition.org/wiki/index.php?title=Student_Forum

General Topics

| Cognition Briefings | http://www.eucognition.org/wiki/index.php?title=Cognition_Briefings |
| Definitions of Cognition | http://www.eucognition.org/wiki/index.php?title=Definitions_of_Cognition |

Applications of Cognitive Systems
http://www.eucognition.org/wiki/index.php?title=Applications_of_Cognitive_Systems

Periodically we make available a series of statistics on the frequency with which the website and wiki resources are being accessed so that they can be used as metrics to evaluate the success of the Coordination Action.   These statistics are available on the website here

http://www.eucognition.org/website_statistics.htm

Each report shows the top 100 most frequently accessed pages on the website and access on the Wiki over the past year. It also provides access statistics for the ECVision website (European Research Network for Cognitive Computer Vision Systems) which is hosted by euCognition.

For convenience, we reproduce the most recent statistics below; please refer to the website for the full set.

It should be borne in mind that these statistics represent not the total number of times a particular page or resource has been accessed, but the number of times in the preceding 12 months. This helps balance the weighting of statistics of resources that have been recently introduced vis-à-vis those that have been on the website since the beginning.

A brief look at these statistics reveals two clear facts: the popularity of the speakers presentations from the six-monthly meetings and the growing number and popularity of cognition briefings.

1st December 2008

The following are the top 100 most popular web pages on the site in the previous 12 months.
Web pages are grouped in three categories: euCognition website, euCognition Wiki, ECVision website

euCognition Page	Number of requests
/members.htm	4817
/asm-whitepaper-final-060804.pdf	4810
/six_monthly_meeting_2/Sanja_Fidler.pdf	4041
/Elizabeth_Spelke.pdf	3180
/Scott_Kelso.pdf	2850
/network_actions_funded.htm	2767
/six_monthly_meeting_5.htm	2493
/enactive_AI_white_paper.pdf	2400
/official_events.htm	2348
/six_monthly_meeting_3/Peter_Redgrave_presentation.pdf	2315
/Jiri_Wiedermann.pdf	2309
/news.htm	2122
/network_actions/NA141-1_outcome.pdf	1947
/embodying_cognition_2006/Gregor_Schoner.pdf	1898
/six_monthly_meeting_2/Hakan_Warston.pdf	1832
/six_monthly_meeting_4.htm	1779
/post-cognitivist/post-cognitivist_abstracts.pdf	1741
/index.htm	1740
/membership.htm	1623
/six_monthly_meeting_2/Rainer_Stollhoff.pdf	1308
/white_papers.htm	1119
/network_actions/NA097-3_outcome.pdf	1074
/costs.htm	1063
/six_monthly_meeting_2/Bill_Sharpe.pdf	1051
/embodying_cognition_2006/Jeroen_Smeets.pdf	1025
/six_monthly_meeting_2/Jose_Santos-Victor.pdf	978
/euCognition_overview.pdf	977
/inaugural.htm	969
/network_actions/NA092-1_proposal.pdf	955
/six_monthly_meeting_2.htm	935
/six_monthly_meeting_6.htm	898
/official.htm	873
/AAAI_symposium.pdf	869
/registration.htm	840
/ABiALS_2006/	756
/six_monthly_meeting_3/Murray_Shanahan_presentation.pdf	751
/fp7-challenge2-background_en.pdf	749
/network_actions/NA004-5_outcome.pdf	746
/papers/ESG2006_abstracts_and_papers.pdf	733
/papers/ErlhagenBicho06.pdf	723
/coevolution_white_paper.pdf	721
/events.htm	704

/SAB_2006/	701
/embodying_cognition_2006/Dante_Chialvo.pdf	693
/jobs.htm	690
/six_monthly_meeting_2/Armin_Duff.pdf	689
/network_actions.htm	671
/post-cognitivist_psychology.htm	671
/euCognition_Request_for_Reimbursement.pdf	649
/software_resources.htm	649
/proceedings.htm	648
/post-cognitivist/index.htm	646
/six_monthly_meeting_2/David_Vernon_&_Bernhard_Sendhoff.pdf	644
/network_actions/NA097-2_outcome.pdf	641
/Education_Breakout.pdf	639
/six_monthly_meeting_1.htm	634
/euCognition_Application_for_Membership.pdf	622
/embodying_cognition_2006/Pim_Haselager.pdf	621
/six_monthly_meeting_4/Tom_Froese_presentation.pdf	619
/John_Shawe-Taylor.pdf	606
/courses.htm	597
/euCognition_Request_for_Reimbursement.doc	597
/network_actions/NA105-1_proposal.pdf	592
/papers/Pinz06.pdf	589
/Abstracts_6th_Czech_Slovak_WS.pdf	576
/euCognition_Application_for_Membership.doc	576
/dynamical_systems_articles.htm	572
/embodying_cognition_2006.htm	571
/cognitive_vision_articles.htm	561
/six_monthly_meeting_5/Bernhard_Hommel_presentation.pdf	558
/six_monthly_meeting_3.htm	551
/inaugural_presentation.pdf	547
/planning.htm	535
/six_monthly_meeting_4/Michael_Arbib_presentation.pdf	535
/partner_search.htm	534
/website_statistics.htm	520
/exec_meetings.htm	513
/network_actions/NA108-1_outcome.pdf	512
/management_reports.htm	510
/network_actions/NA011-1_outcome_summaries.pdf	494
/exec.htm	485
/CVOnline.htm	482
/reports/Economic_Impact_IMT.pdf	452
/six_monthly_meeting_4/Meeting_4_Programme.pdf	452
/questionnaire_results.htm	434
/six_monthly_meeting_1/Hanspeter_Mallot.pdf	431
/papers/VernonMettaSandini06.pdf	421
/network_actions/NA024-2_outcome.pdf	416
/six_monthly_meeting_3/Joanna_Bryson_presentation.pdf	415
/NA130-1/Pavel_Petrovic_presentation.pdf	411
/NA130-1/Michael_Wheeler_presentation.pdf	405
/six_monthly_meeting_2/James_Crowley.pdf	403
/euCognition_Application_for_Student_Membership.doc	402

/euCognition_Application_for_Student_Membership.pdf	402
/papers/Pezzulo08.pdf	402
/six_monthly_meeting_2/Colette_Maloney.pdf	401
/contacts.htm	397
/network_actions/NA217-1_proposal.pdf	393
/embodying_cognition_2006/Randall_Beer.pdf	383
/network_actions/NA023-1_proposal.pdf	377

euCognition Wiki	Number of requests
Main Page	5741
Cognition Briefings	2627
Definitions of Cognition	1902
Research Roadmap	1886
Student Forum	1883
Controversies in Cognitive Systems Research	1014
Applications of Cognitive Systems	950
Course Material	780
Model Curriculum	663
Workshops	566
FP7 ICT Call3 - Challenge 2: Cognitive Systems, Interaction, Robotics	564
Roadmap Kick-off Meeting	536
Research Roadmap Plan B	238
Research Roadmap Plan A	188
Learning Journey: Applications, Requirements, Capabilities	185
Learning Journey: The Role of Information in Cognition	182
Learning Journey: Attention, Vision, Robotics, and Cognitive Systems	178
Learning Journey: Extracting Requirements of a Cognitive Architecture	175
Cognition Briefings	
Working Memory	12348
Automatic and Willed Control of Action	3874
What is Cognition One View of Cognitive Systems	2626
Simulating Speech Production and Speech Acquisition	1633
Schemas and Schema-based Architectures	1603
Autonomy and Cognition	1459
Odor localization	1459
Bayesian Probabilistic Learning in Robots	1050
Symbol Grounding in Cognitive Systems	946
Facial Motion Analysis	919
Bayesian Multisensory Perception	891
Human Behavior Interpretation from Image Sequences	865
Eyes-Neck motor coordination through coupled chaotic systems	773
Naturalized Epistemology and Artificial Cognitive Systems	705
Cognitive Architectures	682
Computationalism	673
Symbol Tethering	619
Biomimetic Robotics	613
Language and cognitive robots	568
Long Term Temporal Dependencies in Recurrent Neural Networks	568
Cognitivism	518
Social Learning in Embodied Agents	508
Subsumption	456
From Image Sequences to Natural-Language Texts	445
Affordances: The review of an inspiring notion	443
Extended Cognition: On the boundaries of cognitive systems	401
Tactile sensing in robots	382

Distributed Intelligence for Smart Assistive Appliances	372
Some Considerations on Spatial Relations	346
Level of Detail AI for Computer Games	338
Universal Darwinism	334
CoEvolutionary Approaches in Cognitive Robotic System Design	325
What is "Enactive" Cognition	318
Modelling cultural transmission and evolution: some references	300
Computational Attention: a Key for Artificial Intelligence	291
Social Phenomena Related to Cooperation in Prisoner's Dilemma	285
Representation: A problematic but unavoidable concept	271
Models of Thought: Post-Cognitivist Methodologies	250
Appraisal	248
Towards Autonomous, Dynamically Dexterous Robots	240
Anticipation and anticipatory behavior	234
Enactive approaches to social cognition	221
Dynamical approaches to development	219
Teleology	209
Enactive concepts	201
Representation: The Future of AI Without It	196
Toward a "Chaotic" Cognitive Architecture	196
Postcognitive psychology and affordance	185
Challenge of Creating a Research Roadmap	175
State Representations in Evolutionary and Robotics Systems	175
Spatial cognition in animals: what about representation	164
Cognitive Robotics	162
The Haken-Kelso-Bunz Model of the Coordination Dynamics of Two Hands	160
ACT-R	148
Comparing Emotion Models Used in Agent Architectures	148
Cognitive and Affective Underpinnings of Risk Attitude	146
Soar	144
Bounded Online Learning with Kernel-Based Perceptrons	139
Sympathy (vs empathy)	139
Affordances: The review of an inspiring notion&printable=yes	132
RCS: an engineering Cognitive Architecture	118
Reclaiming Symbols	106
Interactive Robot Learning	105
Ikaros	100
Multisensory Processing	100

ECVision Website	Number of requests
education/summerschool03/LittleWorldModelling.pdf	2474
education/summerschool03/LittleOverview.pdf	2409
index.htm	2351
about_ecvision/Cognitive_Vision.pdf	1730
home/Home.htm	1681
education/summerschool03/LittleObservingPeople.pdf	1516
education/On-line_Cognitive_Vision_Course.htm	1411
CCVcourse/CCVcourse.zip	1010
news/News.htm	937
bibliography/ECVision_bibtex.htm	765
CCVcourse/Lecture 3/Lecture 3.ppt	623
CCVcourse/Lecture 7/Lecture 7.ppt	608
research_planning/EU_Computer_Vision_Groups.htm	574
CCVcourse/Lecture 1/Lecture 1.ppt	541
CCVcourse/Individual Zip Files/Lecture 1.zip	507
information/six_month_meeting_4/Roadmap_Presentation.pdf	492
information/Specific_Action_Status.htm	484
ecvision_graphics/PDF.gif	466
CCVcourse/Lecture 15/Lecture 15.ppt	462
research_planning/ECVisionRoadmapv5.0.pdf	444
CCVcourse/Lecture 1/Notes.doc	431
about_ecvision/Definition_of_Cognitive_Vision.htm	397
research_planning/Research_Roadmap.htm	378
CCVcourse/Lecture 9/Lecture 9.ppt	371
industrial_liaison/Industrial_Applications_of_Cognitive_Vision.pdf	367
CCVcourse/Lecture 4/Lecture 4.ppt	358
CCVcourse/Lecture 11/Lecture 11.ppt	356
CCVcourse/Lecture 12/Lecture 12.ppt	348
CCVcourse/Lecture 2/Lecture 2.ppt	337
CCVcourse/Individual Zip Files/Lecture 4.zip	323
CCVcourse/Lecture 8/Lecture 8.ppt	322
CCVcourse/Lecture 5/Lecture 5.ppt	321
CCVcourse/Individual Zip Files/Lecture 2.zip	316
industrial_liaison/Application_Prize.htm	309
CCVcourse/Lecture 6/Lecture 6.ppt	303
CCVcourse/LabCWKPostLecture7/Markov Models CWK A.doc	300
about_ecvision/Highlights.htm	297
bibliography/Indexed_and_Annotated_Bibliography.htm	295
CCVcourse/LabCWKPostLecture7/PreCWK_ATutorial.ppt	281
CCVcourse/Lecture 10/Lecture 10.ppt	279
CCVcourse/Lecture 14/Lecture 14.ppt	278
ecvision_graphics/Right_6.gif	273
CCVcourse/Lecture 13/Lecture 13.ppt	267
ecvision_graphics/Checkmark.gif	266
education/summerschool03/LittleSurveillance.pdf	258
CCVcourse/LabCWKPostLecture11/PreCWK_BTutorial.ppt	255
CCVcourse/LabCWKPostLecture11/Markov Models CWK B.doc	254

members/Hans-HellmutNagel.htm	254
research_planning/ECVisionRoadMapv2.3.doc	244
education/TR-SA13-2.pdf	213
CCVcourse/Individual Zip Files/Lecture 3.zip	203
CCVcourse/Individual Zip Files/Lecture 8.zip	190
CCVcourse/Individual Zip Files/Lecture 5.zip	184
CCVcourse/Lecture 7/dog5mm.mpg	184
CCVcourse/Individual Zip Files/Lecture 7.zip	181
research_planning/ECVisionRoadmapv4.2.pdf	176
bibliography/VPCg.htm	161
research_planning/ECVisionRoadMapv2.4.doc	152
bibliography/RaSaEp.htm	151
bibliography/ETq.htm	150
bibliography/MLt.htm	149
education/Summer_School_on_Cognitive_Vision_2003.htm	148
bibliography/CSf.htm	147
CCVcourse/Lecture 1/learns.mpg	145
information/six_month_meeting_2/industrial_liaison_presentation.pdf	145
bibliography/alt_index.htm	141
CCVcourse/Individual Zip Files/Lecture 15.zip	141
education/SA_21-1_Imprecise_Spatial_Information.htm	140
bibliography/RCaEn.htm	137
industrial_liaison/InX.pdf	134
education/summerschool03/GranlundAnisotropicFiltering.pdf	130
CCVcourse/Lecture 1/objects.mpg	129
education/summerschool03/NeumannIntro.pdf	126
research_planning/ECVisionRoadmapv3.3.pdf	126
research_planning/ECVisionRoadMapv2.5.pdf	123
bibliography/KRh.htm	122
research_planning/SA_39-1_Cognitive_Vision_Colloquium.htm	121
research_planning/ECVisionRoadmapv3.2.pdf	112
members/List_of_Members.htm	109
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bibliography/Enns90a.htm	104
bibliography/Grossberg00a.htm	103
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bibliography/Vinzce2001.htm	91
CCVcourse/Individual Zip Files/Lecture 10.zip	89
bibliography/Vassilakis2002.htm	88
information/Sixth_Six-Monthly_Meeting.htm	88
bibliography/Matas2002b.htm	87
information/Second_Six-Monthly_Meeting.htm	87
bibliography/Koubaroulis2002.htm	86
bibliography/Matas2002a.htm	86

Email Lists

There are two email lists which can be used to send email to all members and members of the Executive Committee. These are

members@eucognition.org

executive@eucognition.org

Both lists are moderated by the Network Coordinator so that all emails have to be approved before they are distributed to the recipients. This ensures no spam is distributed and that mail coming from euCognition is seen to be relevant to the members' interests. Postings to the members email distribution list are restricted to items directly linked to euCognition, such as events that are co-sponsored by the network. Notices on other relevant events (e.g. calls for papers, workshop announcements) are posted on the website.

Deviations from the project work-programme

The website is navigated using conventional drop-down menus implemented with client-side scripts. With the exception of the wiki, the server-side of the website is implemented with static HTML rather than PHP scripts and a mySQL database.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
4	euCognition website	4	36	36	DIST

List of milestones

None.

WP5 – Network Coordination

Workpackage objectives

WP5 deals with the coordination of the network activities and monitoring the coordination of the Network Actions. The work focuses on the coherent development of the activities of the network overall, on building an integrated community within the network, on maximizing the interaction between the various activities and areas, and on ensuring that the network is as relevant as possible to all concerned: the membership, the cognitive systems community, and the community at large.

Progress towards objectives

Composition of the Executive Committee

Two new members, Joanna Bryson, University of Bath, and Barbara Caputo, IDIAP, were added to Executive Committee in July 2007 following the review of the project where it was noted by the reviewers that there should be more "diversity" on the committee. The Executive Committee now comprises the following 14 members.

David Vernon (network coordinator)	University of Genova; now at Khalifa University of Science, Technology, and Research, UAE.
Fred Cummins	University College Dublin
Markus Vincze	Technische Universitaet Wien
Tom Ziemke	Högskolan i Skövde
Erik Hollnagel	Association pour la Recherche et le Développement des Méthodes et Processus Industriels (ARMINES
Christoph von der Malsburg	Frankfurt Institute for Advanced Studies (FIAS)
Bill Sharpe	The Appliance Studio Ltd.
Guy Tiberghien	Centre National de la Recherche Scientifique (CNRS)
Juergen Jost	Max Planck Institute for Mathematics in the Sciences
Andreas Engel	University Medical Center Hamburg-Eppendorf
Peter F. Dominey	Centre National de la Recherche Scientifique (CNRS)
Matthias Scheutz	Notre Dame University
Joanna Bryson	University of Bath
Barbara Caputo	IDIAP

Executive Committee Meetings

The Executive Committee did not meet in 2008. A meeting was scheduled for April 2008 at CogSys 2008. This had to be cancelled because an insufficient number of members of the Executive Committee were able to attend. The meeting was rescheduled for June 2008 at the 5th Six-Monthly Meeting in Munich. Again, it had to be cancelled because of the same reason. A meeting was then scheduled for

October but this time it had to be cancelled because of budgetary constraints. It was noted in the Activity Report for 2007 that the attendance of members of the Executive Committee at these meetings had been disappointing and it was hoped that matters would improve in 2008. Clearly, they didn't.

Interaction among Executive Committee Members

In 2006, the Network Coordinator sent approximately 120 emails to the Executive Committee, i.e., one every three days. In 2007, the number of emails was 110. In 2008, the number of email continued at the same rate, exceeding 100 in the first eleven months. This provides a measure of the degree of active participation of the members of the Executive Committee in the coordination of the network.

Roles and Responsibilities of the Executive Committee

Responsibilities for the three areas of Outreach, Scientific Outlook, and Education rotate among the members of the Executive Committee on a semi-annual basis, approximately.

In the first nine months, those responsible were:

Outreach	Erik Hollnagel
Scientific Outlook	Tom Ziemke
Education	Markus Vincze

From October 2006 to March 2007, those responsible were:

Outreach	Bill Sharpe (with particular focus on the euCognition Roadmap)
Scientific Outlook	Fred Cummins (with particular emphasis on cognition briefings)
Education	Matthias Scheutz

It was intended to rotate responsibilities again at the March 2007 Executive Committee meeting. Unfortunately, given the small number of people who actually attended, it was not possible to reassign the responsibilities for the three areas. In the event, Fred Cummins agreed to continue to take responsibility for the Outreach brief (focusing on cognition briefings), Bill Sharpe agreed to continue to take responsibility for the Outlook brief (focusing on the roadmap), and it was agreed to ask Matthias Scheutz to continue to take responsibility for the Education brief (which subsequently he kindly agreed to do).

When only half the Executive Committee turned up for the next meeting in October 2007, rotation of responsibilities was again impossible to consider. After some discussion, it became clear that the original idea assigning responsibility for each of the three areas of Education, Outreach, and Scientific Outlook to members of the Executive Committee on a six-monthly rotation has not worked. Either the time has been too short to accomplish much or the rotation hasn't taken place. Whatever the reason, it was decided at the meeting that for the remaining year or so of the project, we would depend on the individual initiatives

of the members of the members of the Executive on relevant topics rather than sticking with the original assignment of responsibility to areas.

Policy on Official euCognition Events

It was decided at the October 2007 meeting of the Executive Committee to introduce the concept of designated official euCognition events. Any workshop or conference that receives support from euCognition may also apply to be designated an official euCognition event, provided it is open to participation by euCognition members. In turn, any member of euCognition may apply for reimbursement of travel costs to a designated meeting subject to the normal euCognition guidelines on reimbursement of costs and on condition that the person claiming the cost contributes a new cognition briefing to the euCognition wiki.

In 2007, just one meeting was designated an official euCognition event, as follows:

Symposium on Language and Robots Aveiro, Portugal, 10-12 December 2007

However, matters changed dramatically in 2008 with a further 11 meetings being designated official euCognition events:

Workshop: Models of Thought: Post-Cognitivist Epistemologies Munich, 20-21 February 2008

Course on Multimodal Signals: Cognitive and Algorithmic Issues Vietri Sul Mare, Italy, 21-26 April 2008

ABiALS 2008 - The fourth workshop on Anticipatory Behavior in Adaptive Learning Systems, Munich, 26 June 2008

Doctoral Consortium, Munich, 28 June 2008

The Role of Emotion in Adaptive Behaviour and Cognitive Robotics SAB '08 Workshop, Osaka, 11-12 July 2008

Eighth International Conference on Epigenetic Robotics: Modeling Cognitive Development in Robotic Systems Brighton, UK, 31 July - 2 August 2008

Summer School on Non-Linear Dynamics and Robots: From Neurons to Cognition, Madrid, 4-8 August 2008

Workshop on Enactive Approaches to Social Cognition, PowderMills Hotel, Battle, UK, 30 August - 1 September 2008

Adaptive Mechanisms of the Perception-Action Cycle, Workshop in conjunction with the International Conference of Artificial Neural Networks (ICANN 2008), Prague, 6 September 2008

Workshop on Dynamic Field Theory: Applications in Cognitive Science and Robotics, Minho, Portugal, 8-9 September 2008

Workshop on Modelling Cognitive Behaviour (in machines, organisms, organisations), Bristol, UK, 10 October 2008

The Official euCognition Events programme had to be discontinued in August 2008 due to lack of funds.

Deviations from the project work-programme

None.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
5	Network Coordination online resources	5	36	36	DIST

List of milestones

None.

WP6 – Management

Workpackage objectives

WP6 deals with management of the consortium management and focuses mainly on handling the financial aspects such as reimbursement of claims for costs to members, reporting, and other contractual issues.

Progress towards objectives

This is dealt with in section 3 on consortium management.

Deviations from the project work-programme

None.

List of deliverables

Del. no.	Deliverable name	Workpackage no.	Date due	Actual/Forecast delivery date	Lead contractor
6	euCogniiton website	6	36	36	DIST
7	Final plan for using and disseminating knowledge	6	36	36	DIST
8	Report on raising public participation and awareness	6	36	36	DIST

List of milestones

None.

Section 3 – Consortium management

The tasks that are included in this work-package are:

1. Processing of applications for membership
2. Processing and reimbursement of members' costs
3. Prepare consolidated financial report
4. Collection and collation of audit certificates
5. Liaison with Commission Project Officer
6. Collection and distribution of deliverables
7. Monitoring of project budget against expenditure
8. Collation six-monthly management reports
9. Preparation and issue of sub-contracts
10. Maintenance of member database

All ten tasks have been carried out successfully by the Network Coordinator on a daily basis for the past three years.

In the following, we will highlight some special issues.

Website Administrator

As mentioned above, the person that we had originally targeted to take charge of the development of the website declined to accept a contract and the Network Coordinator then had to take responsibility for the design, implementation, and administration of the website. This continued through 2007 and 2008.

Changes to the Consortium

In April 2008, a second contract amendment to reflect changes in the make-up of the consortium was finally effected. The principal changes put into effect by the amendment are as follows.

Addition of Contractors

ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET PROCESSUS INDUSTRIELS (ARMINES) 01 January 2007

STIFTUNG FRANKFURT INSTITUTE FOR ADVANCED STUDIES (FIAS), 27 June 2007

IDIAP (FONDATION DE L'INSTITUT DALLE MOLLE D'INTELLIGENCE ARTIFICIELLE PERCEPTIVE) (IDIAP), 01 July 2007

UNIVERSITY OF BRISTOL (UOB), 01 July 2007

UNIVERSITY OF BATH (UBAH), 01 July 2007

Termination of a contractor's participation

LINKOEPINGS UNIVERSITET, 31 December 2006
RUHR-UNIVERSITAET BOCHUM,   31 December 2006

Domain Names

The consortium has acquired the rights to the euCognition.eu and euCognition.org domain names. We continue to use the .org versions in our day-to-day work as it conveys an image that is more open to international involvement.

We also acquired the rights to the CogSys.eu, CognitiveSystems.eu, and CognitiveRobotics.eu domain names. These domain names point to the Cognition Unit (Unit 5) Commission website
http://cordis.europa.eu/ist/cognition/index.html

Financial Crisis

At the beginning of August 2008, as part of a routine review of the finances of the euCognition network, it was discovered that the financial commitments of the project were projected to exceed the available budget of €1599916.   Furthermore, it also emerged that the costs claimed by the members to date as reimbursements for expenses incurred in connection with euCognition activities exceeded the amount of pre-financing that has is available for such reimbursements (i.e. after the redistribution of pre-financing to other contractors and after deduction of personnel / labour costs).   It quickly became clear that euCognition was in a financial crisis.

There were two aspects to this: one is the limited amount of funds we have available and the other is the flow of these funds.

euCognition has a limited budget. In year 1, we spent only 21% of the total budget. By end of year 2, we had spent only 45%. It appeared we have more than enough funds available to complete year 3 comfortably. However, in 2008 members began to submit claims for costs that they incurred in Years 1 and 2, both in attending meetings and in network actions. In addition, the number of members opting to request reimbursement of costs for attending official euCognition events increased dramatically. The result was that we started to approach the limit of our available funding by July 2008 and, consequently, we had to take quick remedial action, specifically terminate the network action and official event programmes, and cancel the final meeting in December.

There was, though, a major knock-on effect of this unexpected increase in costs. euCognition depends on pre-financing payments from the Commission to fund day-to-day expenditure. We received an initial payment at the beginning of the project and another one after the Year 1 costs were accepted. We were anticipating a second pre-financing payment over the summer on the foot of the Year 2 cost statement. Unfortunately, this was not forthcoming. There is a clause in all Commission contracts which precludes any additional pre-financing payment if the costs incurred are less than 70% of the existing pre-financing. Because our costs in Year 2 were low, we didn't reach the 70% threshold and so no payment was made. This in turn caused a cash-flow crisis: in effect, because of the increased number of claims we reimbursed in 2008, we ran out of money and, at the beginning of August, we had to suspend payments to members. At that point, there were approximately 150 outstanding unpaid claims waiting to be reimbursed to members, guest speakers, and other people associated with euCognition events and activities.

The Commission project officer tried to help us overcome this situation but the 70% rule is fixed fast and it emerged that no derogation was possible. As a way over the resultant impasse, the Commission agreed to allow the submission of a supplementary management report (i.e. the current document) and financial statement mid-year. This had the effect of taking the project over the 70% was based on the costs incurred in Year 2, not the increased Year 3 costs. This allowed us to resume payments and was sufficient to cover all outstanding claims. Unfortunately, we were forced to suspend the reimbursement of costs again in December when this pre-financing payment was depleted. Since we will receive no more payments from the Commission until the final reports and financial statements have been submitted and accepted at the end of the year, members will have have to endure an extended delay before being reimbursed.

That deals with for the cash-flow crisis. There remains, however, the issue of the projected costs exceeding the available budget. To deal with this, we implemented a detailed analysis of all historic costs, committed costs, and projected costs. All planned activities which had not yet been given a final and firm commitment of support were cancelled (e.g. the final meeting) and all funding programmes were terminated (e.g. the official event programme and the network action programme). This had the effect of halting any increase in projected costs but, of course, didn't help reduce committed costs. Every member who had received a commitment for support was contacted to request them to minimize their costs and to ensure that their claims were below the budget allocated. This had a significant impact and reduced the actual commitments considerably. In addition, several members of the Executive Committee agreed to offer their time free of charge and undertook not to claim any labour costs for the final year of operation and, in some instances, not to claim any labour costs for the full duration of the project. This resulted in a large reduction in the network's total financial commitments. As time of writing, the projected costs for the three year period is slightly below the project budget and we are reasonably confident that we will not over-run costs at the end of the contract.

Section 4 – Other issues

None.

ANNEX – Plan for using and disseminating knowledge

Section 1 – Exploitable Knowledge and its Use

The euCognition project is a Coordination Action and therefore does not involve the creation of exploitable knowledge.

Section 2 – Dissemination of Knowledge

The euCognition project is dedicated to the production of freely-available resources for the advancement of the discipline of artificial cognitive systems. These resources are available on the euCognition website and Wike at www.eucognition.org

Publications
None.

Dissemination Activities

These are treated in Workpackage 1 on Outreach**.**

Section 3 – Publishable Results

None at this point.