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COGAIN

Communication by Gaze Interaction

Network of Excellence

Information Society Technologies

**Periodic Activity Report**  
**Year 2**  
**Executive Summary**

Period covered: from 01.09.2005 to 31.08.2006

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Start date of project: 01.09.2004

Duration: 60 months

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Project coordinator organisation name: University of Tampere

# Executive Summary

*COGAIN is a network of excellence on Communication by Gaze Interaction, supported by the European Commission's IST 6th framework program. COGAIN integrates cutting-edge expertise on interface technologies for the benefit of users with disabilities. The network gathers Europe's leading expertise in eye gaze interaction with computers in a research project on assistive technologies for citizens with motor impairments.*

## Objectives and expected end results

Current eye tracking equipment allows users to generate text on a computer by using eye gaze. Users are able to select letters and numbers by looking at a keyboard on a screen with their eyes, and can construct words and sentences that can be spoken aloud by the system. Using these systems both empowers and enables people with disabilities as they can now communicate without the need for an assistant or helper, giving the users greater freedom in their lives. Eye tracking systems that allow text entry by eye gaze have been in existence for about two decades, but the technology is still only available to a small portion of the potential user population. Obstacles for more wide-spread use currently include: the high cost of eye tracking equipment, the limitation that gaze communication applications may only work with a particular dedicated eye tracking device, and finally that eye tracking devices may require experts to operate them.

The COGAIN consortium (members of which are listed in Table 1) is formed from cutting edge research groups and companies who have joined forces for a common goal: empowering people with disabilities. There are over 100 researchers in the network. Through the integration of research activities, the network will develop new technologies and systems, improve existing gaze-based interaction techniques, and facilitate the implementation of systems for everyday communication.

The project aims to make research results and commercial solutions known and available, at an affordable cost, to the user community, to SMEs, and to local organisations and authorities. Usability and take-up of the results is ensured by having the user communities as an integral part of the network (see Figure 1, with images of users involved in COGAIN user trials). COGAIN also aims at developing mainstream applications that would benefit all. COGAIN believes that assistive technologies are most successful when they provide applications that are both empowering and fun to use, and this is one of our main aims.



**Figure 1.** People with a wide range of varying needs, ages and disabilities are involved in COGAIN user trials. The images are taken from Deliverable 3.3 "Report of user trials and usability studies".

## Organisation and contractors involved

The members of the COGAIN consortium are listed below in Table 1.

Participant name	Participant short name	Country
University of Tampere	UTA	Finland
IT University of Copenhagen	ITU	Denmark
Bispebjerg Hospital	BH	Denmark
Danish Centre for Assistive Technology	DC	Denmark
Risoe National Laboratory	RISOE	Denmark
Danmarks Tekniske Universitet	DTU	Denmark
Technische Universitaet Dresden	TU DRESDEN	Germany
Universitaet Koblenz -Landau	UNI KO-LD	Germany
Universität zu Lübeck	UzL	Germany
Hewlett Packard Italiana SRL	HP	Italy
Politecnico di Torino	POLITO	Italy
Siauliu Universitetas	SU	Lithuania
Tobii Technology	Tobii	Sweden
ACE Centre Advisory Trust Ltd	ACE	United Kingdom
The Chancellor, Masters and Scholars of the University of Cambridge	UCAM	United Kingdom
De Montfort University	DMU	United Kingdom
Tokyo Institute of Technology	TIT	Japan
Universitaet Zuerich	UNIZH	Switzerland
Universidad Publica de Navarra	UPNA	Spain
Czech Technical University	CTU	Czech
Västra Götalands Läns Landsting	DART	Sweden
Loughborough University	LBORO	United Kingdom

**Table 1.** List of COGAIN partners during the second project year.

Three new partners are in the process of joining the project during the third year: Metrovision (France), LC Technologies (USA), and EyeTech Digital Systems (USA). All of them are eye tracker manufacturers.

In addition to the core members, COGAIN involves two external boards to consult in the future planning and decision making activities: the Board of User Communities (BUC) and the Board of Industrial Advisors (BIA). Both boards function as advisory entities whose input will be sought regarding the practical usefulness, dissemination and possible commercialisation of the research findings. An up-to-date list of current members of BUC and BIA is available online at <http://www.cogain.org/boards>.

The work in COGAIN has been done within 8 workpackages: (WP1) Durable community building, (WP2) Standardisation, (WP3) User involvement, (WP4) Tool development, (WP5) Eye tracker development, (WP7) Community outreach, (WP8) Academic impact, and (WP9) Management. (WP6 “Analysis and evaluation” was merged into WP3 for practical reasons as the evaluation is closely linked with user trials.)

## Work performed and results achieved during the second year of the project

During its second year of existence, COGAIN continued the work on surveying the state-of-the-art, with more emphasis on successful implementation.

- *D2.3 Implementation of COGAIN Gaze Tracking Standards* continues the work started in the first year by implementing a wrapper that puts into effect the COGAIN standards drafted in D2.2.
- *D2.4 A survey of existing 'de-facto' standards and systems of environmental control* reports the diverse existing environmental control standards and considers which of them are most relevant from the gaze control point of view.
- *D3.2 Report on features of the different systems and development needs* considers the relevance of user requirement issues defined in D3.1, taking into account the eye control development aspect; which key features are the most relevant to incorporate or adapt in relation to the used software.
- *D3.3 Report of user trials and usability studies* summarizes the results from user trials conducted by three COGAIN partners (ACE, DART and POLITO). The trials included tens of people with varying disabilities, who tried out several different eye tracking systems.
- *D5.2 Report on new approaches to eye tracking* summarises algorithms developed or advanced by COGAIN partners, with examples of practical implementations in gaze tracking systems.

COGAIN reports are available online at <http://www.cogain.org/results/reports>.

Some of the applications developed in COGAIN have been available online since the first project year. During the second year, new applications such as gaze-controlled games, have been developed (even if not yet available online), and the freely available applications have been further developed. For example, GazeTalk now not only supports typing by gaze but also allows the user to browse the web, play multimedia files or read PDF files. It also supports step-scanning which allows people with very little control over eye movements to use it. In the user requirements report (D3.1) it was considered important that people can move easily between applications. This requirement has been met by the deliverable *D4.2 Release of linked communication systems on COGAIN site*, which links GazeTalk and Dasher allowing the user to easily move between them (see Figure 2).

For more information and to download the applications, see <http://www.cogain.org/results/applications/>.

COGAIN has put special effort on dissemination activities, including the scientific community, assistive technology professionals, and the general public. COGAIN gave public demonstrations in over twenty events, including international and national conferences, workshops and seminars. Two press releases were prepared and more than ten COGAIN related articles were published in public newspapers and magazines.

New dissemination material was produced

- *D7.3 COGAIN brochure including the new partners* is available in several languages. The list of partners is implemented as an appendix to the brochure.
- *D7.4 COGAIN poster aimed at the general public* is available in two sizes.
- *D7.5 COGAIN standard slide show* includes basic information about COGAIN. The slides are intended to help people in giving talks about COGAIN, and can be modified as needed.

A list of known media appearances and dissemination material are available at <http://www.cogain.org/media>.

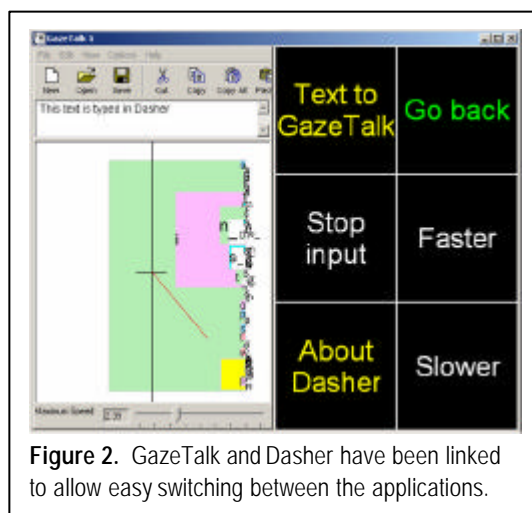


Figure 2. GazeTalk and Dasher have been linked to allow easy switching between the applications.

COGAIN has also been active in scientific conferences. For example, members of COGAIN were active in the Eye Tracking Research and Application symposium (ETRA 2006) by acting as a conference co-chair, by giving the keynote speech and by presenting several papers and posters. Over twenty COGAIN related scientific papers were published in journals and conference proceedings during the second project year.

A bibliography of COGAIN publications is available online at <http://www.cogain.org/bibliography/>.

### **Promoting integration and fostering durable community building**

COGAIN members have organised several face-to-face meetings and internal workshops to support joint work. For example, the following research retreats were organised:

- WP4 research retreat on bio-potentials and gaze control in October 2005 (organised twice, once at ACE in the UK and once at ITU in Denmark).
- WP3 mini research retreat on practical organisation of the user trials between ACE, DART and POLITO at ACE in November 2005.
- WP2 research retreat on standardisation issues in April 2006.
- WP3 research retreat on various issues related user trials, including ethical issues and data collection methods, at ACE in June 2006.

In addition, several minor meetings with two or a few people were organised, some of them online by phone or Skype. A few people were also supported by mobility grants that allowed stays of two weeks at the hosting organisation.

Close collaboration has resulted in researcher exchange between partners. For example, a PhD student from UPNA (Spain) first visited ITU (Denmark) with the COGAIN mobility grant for a short duration. He has now moved to ITU for the duration of his PhD studies, co-supervised by ITU and UPNA.

Reports related to integration activities and the continuity of the network produced during the second year:

- *D1.3 Report on continued funding possibilities for COGAIN activities* considers issues related to the durable community building and on ensuring the existence of the network after the funding from the Commission ends.
- *D1.4 Procedures for COGAIN conference* report reviews the already organised COGAIN conferences and sets procedures for the future conferences – as a tool for durable activity.
- *D8.2 Report on joint educational possibilities* considers what kind of joint educational possibilities there are, or could be, within the network. Actions to enhance collaboration in training are suggested.

Finally, a lot of effort was put on in advance planning of the COGAIN Camp and COGAIN 2006 Conference, which occurred in the beginning of the third year and will thus be reported next year.

### **Contact details**

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