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COGAIN

Communication by Gaze Interaction

Network of Excellence

Information Society Technologies

Periodic Activity Report
Year 3
Executive Summary

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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. 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. COGAIN 2006 (September 2006,Turin, Italy) attracted many visitors from outside the network. More photos of the event are available online at http://www.cogain.org/photos/camp2006.

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
Metrovision	MV	France

Table 1. List of COGAIN partners during the third project year.

Two new partners will join the project from the beginning of the fourth project year: LC Technologies (USA), and EyeTech Digital Systems (USA). Both 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 (see 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 or practical reasons as the evaluation is closely linked with user trials.)

Work performed and results achieved during the third year of the project

During its third year of existence, COGAIN concentrated especially on producing information and training material. In addition to reports, the deliverables include example video clips, PowerPoint presentations and information published on web (for wide distribution and easy access).

- *D2.5 Draft standards for gaze based environmental control* continues the work started in D2.4 by reviewing existing recommendations and outlining interface standards and guidelines with an emphasis on safety issues and controllability via gaze.
- *D3.4 Eye control Hints and Tips* is a collection of training material consisting of PowerPoint presentations with notes and example videos. Online versions are under construction at http://www.cogain.org/user_involvement/eye-control-hints-and-tips/.
- *D4.3 Report on Asian language versions of COGAIN communication systems* discusses implementation issues of Asian language versions of Dasher and GazeTalk. To learn more, and to download the systems, see http://www.cogain.org/results/applications/.
- *D4.4 Japanese version of an integrated gaze communication system available online*. This is a Japanese version of the integrated GazeTalk and Dasher. For more information (in Japanese) and download, see http://www.cogain.org/results/applications/gazetalk_jp.
- *D4.5 Online information resources on how to use the gaze for control of selected games*, see http://www.cogain.org/links/gaze-controlled-games
- *D4.6 Instruction material for a gaze typing system available on COGAIN site* includes user manuals as well as various video clips demonstrating the features of the GazeTalk system, available online at http://www.cogain.org/results/applications/gazetalk.
- *D5.3 Eye tracking hardware issues* gives an overview of the hardware components and requirements for a video-based eye tracker.
- *D7.6 COGAIN video* was recorded at the COGAIN 2006 camp. It contains interviews of developers and researchers as well as video clips of end-users demonstrating using gaze-controlled applications, see http://www.cogain.org/media/videos.
- *D8.3 Student competition* aimed at boosting the development of new, innovative applications that take benefit of eye input, especially leisure applications. COGAIN is currently negotiating with the students who submitted to the competition to get the programs (or demo versions) for distribution via the COGAIN web portal. See http://www.cogain.org/downloads/leisure-applications.

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

For more information about applications and download, see http://www.cogain.org/results/applications/.

Dissemination activities

The *COGAIN 2006 Camp* in Turin, Italy, started the third project year. The event had two parts: the two-day COGAIN 2006 conference that was open to the public and three days for internal project meetings. The open conference and exhibition attracted a lot of interest from outside the network (see Figure 1), about half of the exhibition visitors as well as half of the submitted conference papers were from organizations outside COGAIN. We were especially happy to attract local authorities and healthcare professionals. COGAIN 2006 proceedings are available at http://www.cogain.org/cogain2006/#proceedings

COGAIN has put special effort on dissemination activities, including the scientific community, assistive technology professionals, and the general public. The efforts were recognized at IST 2006 in Helsinki where the COGAIN stand was voted as one of the three finalists in the IST 2006 Best Exhibit competition, see http://www.cogain.org/photos/ist2006 for photographs and a video of the event. In addition, COGAIN gave public demonstrations in over 20 events, including international and national conferences, workshops and

seminars. COGAIN has also attracted the interest the public press. A list of known media appearances and dissemination material are available at http://www.cogain.org/media.

COGAIN has also been active in scientific conferences. For example, the Japanese version of GazeTalk was demonstrated at the ALS/MND 2006 symposium in Yokohama, Japan, where also 400 copies of the Japanese version of GazeTalk were distributed on CDROM. In addition, COGAIN and EU-NEST- Pathfinder Project PERCEPT organized a joint symposium on usability at the ECEM 2007 conference. Over thirty COGAIN related scientific papers were published in journals and conference proceedings during the third 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:

- WP2 research retreat on standards related to environmental control jointly with COGAIN partners and OATS (Open Source Assistive Technology Software), hosted by DMU in Leicester, 4-5.7.2007.
- WP3 research retreat on preparing training material about eye control assessment, hosted by DART in Gothenburg, 23.2.2007.
- WP5 research retreat on eye tracking safety issues, hosted by CTU in Prague, 16.5.2007.
- Joint plenary with WP1, WP2 and WP7 at the COGAIN 2006 camp.
- Joint plenary with WP2 and WP8 at the COGAIN 2006 camp.
- Joint plenary with WP4 and WP5 at the COGAIN 2006 camp.
- Meetings of the BUC and BIA advisory boards, followed with a joint plenary with both advisory boards and COGAIN, at the COGAIN Camp 2006.

Two PhD courses were organized jointly by the COGAIN partners:

- PhD Course on Eye-Computer Interaction: Eye Performance and Interface Design, organized in conjunction with the COGAIN 2006 camp in Turin, Italy, 6-8 September 2006. See the course web page at http://www.cogain.org/events/camp2006/phd_course.
- PhD course on Movements of the Human Eye was jointly organized by COGAIN and PERCEPT in Dresden 7-9 March 2007, see http://www.cogain.org/newsitems/PhDCourse-Dresden2007.

In addition, several minor meetings with two or a few people were organised, some of them online by phone or Skype. There have also been a few longer visits by people from one partner organization to another, some of the supported by COGAIN and some from other funding sources.

Finally, a lot of effort was put on in advance planning of the COGAIN Camp and COGAIN 2007 Conference, which occurred in the beginning of the fourth year and will thus be reported next year.

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