MERCO
PROJECT CONSORTIUM

MERCO

Project ID: C2013/1-3

Start Date: June 2014

Closure date: April 2017

Partners:

AVS Systeme AG, Switzerland

Chalmers University of Technology, Sweden

Ericsson AB (EAB), Sweden

ETH Zürich, Switzerland

Intelliconcept AG, Switzerland

Semcon Sweden AB, Sweden

Touchtech AB, Sweden

Co–ordinator:

Dr. Morten Fjeld

t2i Interaction Laboratory,
Interaction Design AIT,
Chalmers University of Technology,
Sweden

E-mail: fjeld@chalmers.se

Project Websites

https://www.celticplus.eu/project-merco/

http://www.icvr.ethz.ch/research/projects/active/active/merco/index_EN

http://t2i.se/merco/

http://www.semcon.com/merco

Mediated Effective Remote Collaboration

This research project aims to produce close-to-market collaboration solutions for teamwork between people in multiple locations. Today, teamwork such as idea generation, complex decision-making, or expert-to-novice knowledge transfer often requires the physical presence of stakeholders. This is mainly because current teleconferencing solutions are unable to adequately capture, transfer, and display the mass amount of subtle information required for effective collaboration, for instance hand gestures and facial expressions. In the Mediated Effective Remote Collaboration (MERCO) project we address collaboration issues in two stages of a typical product's life cycle (see figure below). While *feasibility study/concept* processes represent the first project focus, *aftermarket diagnostics and maintenance* processes represent the second project focus.

Main focus

Even though collocated teamwork takes place in a single room, information is exchanged within a number of spaces. Artifacts are generated in a common task space, gestures are used in a workspace to emphasize or even replace the spoken word, e.g. "this" or "there". Also, information is exchanged in a communication space, such as facial expressions, nodding or shrugging, verbal communication, and eye contact. For an efficient brainstorming meeting involving remote participants, all three spaces – task space, workspace, and communication space – must be captured, aligned, and correctly communicated. If only one space is transferred, or transferred spaces are not aligned properly, important modes of communication like gestures become

meaningless and the whole system's efficiency is significantly reduced. Off-the-shelf systems focus on support for generating artifacts on the task space, i.e. they offer new interaction devices to make the work on interactive surfaces more intuitive and efficient. However, only a few systems have addressed the fact that the workspace must also be captured, transferred and displayed properly.

Approach

In the MERCO project, we investigate new ways to capture the task space, workspace, and communication space by using off-the-shelf components only. Such components can create a multi-way communication system that includes all three spaces of communication. Hence, we will propose a set of principles using portable devices such as tablet computers or smart phones. These principles will be compared, and user-studies will show how well gestures in the workspace are captured, processed, transferred and perceived by a remote partner.

In the MERCO project, there are two academic research partners (ETH Zürich, Switzerland and Chalmers University of Technology, Sweden). On the industrial side, AVS Systeme AG and Intelliconcept AG – both Swiss hi-tech companies – are leading system integrators for net-based communication installation. Ericsson AB (EAB) is a global player from Sweden that will use and verify the system. Also based in Sweden, Semcon AB is a leader in the areas of human factors and remote collaboration including requirement setting, interaction design, prototyping, user testing, and verification, and Touchtech AB is a software powerhouse in the field of interactive software solutions. This project will

PRODUCTION STRATEGY & PLANNING

FEASIBILITY STUDY / CONCEPT

PRODUCT DEVELOPMENT

PRODUCTION

MARKETING / AFTERMARKET

produce novel collaboration solutions in hardware and software that can be immediately deployed to improve net-based collaboration, while the close-to-market-approach also guarantees a strong market launch.

Main results

The first phase of the project shall deliver insights and solutions to challenges in a feasibility study and a concept ideation process (see figure below). This phase will for instance focus on:

♦ Developing interaction devices, for instance smart handheld devices that can be unequivocally detected on interactive screens during simultaneous interaction.
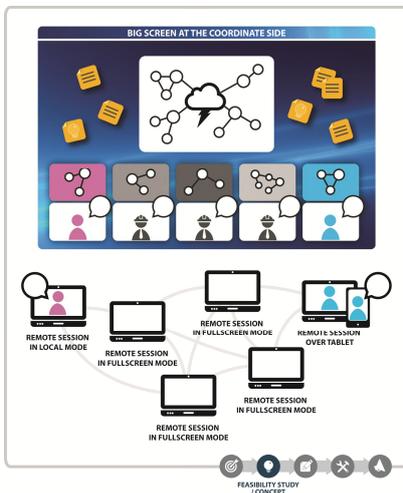
♦ Tracking and analyzing pointing gestures in front of or over interactive surfaces.

♦ Realizing serialization of parallel content in the task space to be displayed on small screens.

It is intended that the second phase of the project will address challenges in aftermarket, diagnostics, and maintenance (see figure above). This phase will for instance focus on:

♦ Developing collaborative control room environments that can support the multitask nature of the operations. This design will address collaborative usage by operators, factory personnel, and logistics personnel.

♦ Establishing a set of user-defined gestures to intuitively control and manipulate content for a collaborative environment on the display.

♦ Defining appropriate interface tools that allow the factory worker to efficiently describe the problem.

Impact

For Ericsson AB (EAB), one of the most obvious expectations stems from the usage of the system in its product development process. Another important commercial expectation for Ericsson is to have a convincing application that can be shown to its customers to demonstrate the benefits of broadband communication. Semcon AB is already a global player in industrial, automotive, and interaction design. Adding research and development of remote collaboration technology will further enhance its portfolio of cutting-edge experience and skills. For Touchtech AB, extended software capabilities realized within the MERCO project will help towards increasing sales in the company's main application fields such as museums and exhibitions, showrooms, fairs, events, workshops and meetings. For AVS Systeme AG, most of the commercial expectations from the project are based on an extension of existing systems with need of low technical modification only. Here, customers mainly from control centers such as airports, police departments, and fire brigades will be addressed. Commercial expectations can also target customers who have to renew a system for various reasons. Intelliconcept AG, for example, could expect to extend their core business in independent engineering and design of high-end media and digital signage systems, as well as smart home and control room design.

About Celtic–Plus

Celtic-Plus is an industry-driven European research initiative to define, perform and finance through public and private funding common research projects in the area of telecommunications, new media, future Internet, and applications & services focusing on a new „Smart Connected World" paradigm. Celtic-Plus is a EUREKA ICT cluster and belongs to the intergovernmental EUREKA network. Celtic-Plus is open to any type of company covering the Celtic-Plus research areas, large industry as well as small companies

or universities and research organisations. Even companies outside the EUREKA countries may get some possibilities to joine a Celtic-Plus project under certain conditions.

Celtic Office

c/o Eurescom, Wieblinger Weg 19/4

69123 Heidelberg, Germany

Phone: +49 6221 989 210
E-mail: office@celticplus.eu
www.celticplus.eu