Project Results

Empathic

Humane technology for enhanced user experience

Executive summary

The ITEA 2 project EMPATHIC PRODUCTS uses affective computing technologies to understand and respond to user intentions and emotions, thereby enhancing user perception and experience, especially in the entertainment, communication, wellness and marketing domains.

Project origins

EMPATHIC is a response to the need for a toolbox of well-packaged affective technologies to make software-intensive products empathic. To get these technologies to become easy-to-integrate, validated and well-documented components for existing and future products, it is crucial to incorporate them into mainstream software-intensive products. Therefore, the project targeted the creation and utilisation of a toolbox of empathic technologies to showcase, evaluate and validate the feasibility of the empathic products with end users along with a methodology for empathic product design and analysis of business models suitable for these products. Central to the project's objectives was user experience: if the end-users do not perceive added value, they will not be motivated to use the product or service, or will feel short-changed, thereby robbing the service provider of clients or audience, or harming the brand experience they provide. Four domains – entertainment, communication, wellness and marketing – provided the focus for the project's aim of making an impact through tangible products on science, business and technology.

Technology applied

The project explored existing affective technologies for sensing emotions and intentions, and providing affective feedback.

The toolbox includes packaged technologies for sensing emotions from face, posture, behaviour, voice, text, and physiological measurements, and providing feedback by means of emotional avatars.

Each of the empathic components in the toolbox was assessed for its performance and potential, and integrated in a wide variety of applications (products) in the four target domains to evaluate their feasibility in practice. Although the current state of the art does not allow for a robust, accurate and 100% reliable recognition of a person's emotions or intentions, the project has demonstrated the usefulness of adding even rudimentary empathy to products when designed carefully. Besides providing a competitive advantage to products, empathic applications can evangelise users and the market to demonstrate the interest of such functions. Furthermore, demos revealed the practical application of detecting and revealing emotions, for example, when watching TV and gaming or in the area of autism and elderly care.

![UX](image of theatre masks with "UX" text)

User experience

Making the difference

In the area of empathic entertainment, emotion has always been in the focus. Games striving for ever more real characters will welcome the inclusion of emotional models, while capturing TV viewers emotions will help to provide better content and recommendations. In terms of empathic communication, normal evolution will lead to new empathic features in the communication from instant messaging, email, mobile call and video conferencing to social networks. Besides providing an

improved feeling of presence, empathic features can also help to focus on the main message of the communication, or provide feedback on audience interest and mood. Good business opportunities for intention aware monitoring solutions exist for empathic wellness as longevity is creating a need for new technologies that allow to live longer independently at home and in the area of mental health support, including emotional feedback and stress analysis, may form an important extension to therapy. Finally, global advertising and international retail channels are creating a massive market that is keen to integrate the latest technologies to help better understand customers and drive sales – neuromarketing & customer segmentation.

The results of the project are being exploited (or there are plans to do so) by many of the industrial partners, including a Web Conferencing (WebRTC) prototype with video analysers and avatar that was used, tested and evaluated during the project and an instant messaging proto-solution by Alcatel-Lucent, which integrates empathic modules (text analysis). Furthermore, the Alcatel-Lucent Wonderboard is the corporate screen which has been used to integrate and test several Empathic components, with the business market the intended target (http://www.getwonderboard.com).

Comland developed a gamified app to teach emotional expression to autistic people, whereby emotions are modelled by selecting appropriate responses, and tokens collected for choosing correctly. With the app working as a mirror, the automatic emotion recognition results in a unique value proposition. Delicode developed various games for children with empathic features (www.kineticstories.com, www.skoogen.net), and successfully used empathic features in entertaining interactive marketing. Inabensa has developed a habit control system to develop and integrate new technologies that use intelligent and interoperable sensors to monitor ambient parameters (e.g. position, luminosity level, temperature) for the wellbeing of the user and to act in a predictive and intelligent way to increase the energy efficiency of a building (hospitals, offices, etc.). The Face Reader technology piloted by Vicar Vision in the project in a shopping centre by means of a virtual shop assistant was spun out into a start-up company: http://www.humaninsightservices.com. These are all examples of applications that can have an impact on quality of life. Empathic components developed or improved in the project are available from partners and can be found in the portal (http://portal.empathic.eu).

Major project outcomes

Dissemination
- Approx. 40 publications in conferences, journals and books

Exploitation (so far)
- Various empathic components and product concepts can be found in http://portal.empathic.eu
- Wonderboard: Enterprise open social information presentation platform with empathic features by Alcatel-Lucent: http://www.getwonderboard.com
- Empathic gaming by Delicode: http://www.kineticstories.com, http://www.skoogen.net, and Loria: http://talc1.loria.fr/empathic/emosim/
- Public API's for emotion extraction from text (http://talc2.loria.fr/empathic) and physiological data (http://sentientapi.tecnalia.com)
- Services on behavioural analysis and neuromarketing by VicarVision: http://www.humaninsightservices.com

Standardisation
- Loria-Synalp EmotionML implementation (https://code.google.com/p/loria-synalp-emotionml/)

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Partners

Belgium
Hasselt University
Softkinetic Software
Spikes n.v.
TP Vision Belgium NV
VRT

Finland
Delicode
Huittisten Sanomalehti oy
Kaukomarkkinat Creation crew
Laurea University of Applied Sciences
Lingsoft
Valve Vanguard
VTT Technical Research Centre of Finland Ltd.

France
Alcatel Lucent Bell Labs France
CityPassenger
Institut Mines-Télécom
Lille 1 University
Maidis
Université de Lorraine - LORIA (UMR 7503)

Lithuania
Kaunas University of Technology
UAB Fazer Lietuva
UAB RUTA

Netherlands
Noldus Information Technology BV
VicarVision

Portugal
Instituto Superior Miguel Torga
UNIVERSIDADE ABERTA

Slovenia
Comland d.o.o.

Spain
Fundacion Tecnalia Research & Innovation
INABENSA Instalaciones
Instituto Ibermática de Innovation (I3B)

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July 2012
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June 2015

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