Univ.Prof. Dr. Alois Ferscha

Institut für Pervasive Computing
Johannes Kepler Universität Linz
Altenberger Strasse 69
A-4040 Linz

Phone: +43-732-2468-8555
Mobile: +43-699-1111-1010
Fax: +43-732-2468-8426

ferscha@soft.uni-linz.ac.at
http://www.soft.uni-linz.ac.at

Human Computer Confluence - Towards a Flourishing Symbiosis of Society and ICT

HCI research over three decades has shaped a wide spanning research area at the boundaries of computer science and behavioral science, with an impressive outreach to how humankind is experiencing information and communication technologies in literally every breath of an individuals life. The explosive growth of networks and communications, and at the same time radical miniaturization of ICT electronics have reversed the principles of human computer interaction. Up until now considered as the interaction concerns when humans approach ICT systems, more recent observations see systems approaching humans at the same time. Humans and ICT Systems apparently approach each other confluently.

In this presentation I first look back into the history of human oriented ICT systems, like Pervasive and Ubiquitous Computing. 20 years after M. Weiser's Scientific American article "The Computer for the 21st Century" (1991), the vision impacting the evolution of Pervasive / Ubiquitous Computing is still the intuitive, unobtrusive and distraction free interaction with omnipresent, technology-rich environments. The metaphor of profound technologies weaving "themselves into the fabric of everyday life until they are indistinguishable from it" has indeed challenged the evolution of the research field, fertilized by two diametrically opposed technology trends: (i) the miniaturization of information and communication electronics, and (ii) the exponential growth of global communication networks. Over it's more than two decades of evolution, the field has been undergoing three generations of research challenges: The first generation aiming towards autonomic systems and their adaptation was driven by the availability of technology to connect literally everything to everything (Connectedness, early to late nineties). The second generation inherited from the upcoming context recognition and knowledge processing technologies (Awareness, early twentyhundreds), e.g. context-awareness, self-awareness or resource-awareness. Finally, a third generation, building upon connectedness and awareness, attempts to exploit the (ontological) semantics of Pervasive / Ubiquitous Computing systems, services and interactions (i.e. giving meaning to situations and actions, and "intelligence" to systems) (Smartness, from the mid twentyhundreds).

I will summaryize on what the scientific community has identified as the core research challenges -embraced by human computer confluence- for the next decade (www.hcsquared.eu). Among the most pressing research challenges are models for cognitive and social capacities of future generation ICT systems, empathic and emotional intelligence, prosthetic ICT, blended real/virtual living spaces, socio-technical superorganisms, and ultimately evolutionary principles for a flourishing human - ICT symbiosis.

Related Publications

A. Ferscha: 20 Years Past Weiser: What's Next? IEEE Pervasive Computing, Vol. 11, No. 1, pp. 52-61, 2012.

A. Ferscha, N. Davies, A. Schmidt, N. Streitz: Pervasive Socio-Technical Fabric. Proceedings of the the European Future Technologies Conference and Exhibition 2011, May 4-6 2011, Budapest, Hungary, Elsevier Ltd, 2011.

A. Ferscha, P. Lukowicz, S. Pentland. From Context Awareness to Social Awareness IEEE Pervasive Computing, IEEE Computer Society, Los Alamitos, CA, USA, Vol. 11, No. 1, pp. 32-41, 2012.

SHORT BIOGRAPHY ALOIS FERSCHA

Alois Ferscha was with the Department of Applied Computer Science at the University of Vienna at the levels of assistant and associate professor (1986-1999). In 2000 he joined the University of Linz as full professor where he heads the Excellence Initiative “Pervasive Computing”, the department of Pervasive Computing, the Research Studio Pervasive Computing Applications and RIPE (Research Institute of Pervasive Computing).

Currently he is focused on Pervasive and Ubiquitous Computing, Networked Embedded Systems, Embedded Software Systems, Wireless Communication, Multiuser Cooperation, Distributed Interaction and Distributed Interactive Simulation. He has lead international EU funded projects (EU FP7, FET: SAPERE, HC2, PANORAMA, SOCIONICAL, OPPORTUNITY; EU FP6, FET: BeyondTheHorizon, InterLink, CRUISE), but also national projects (DISPLAYS, SPECTACLES, PowerSaver, WirelessCampus, MobiLearn) research, and holds tight cooperation with industrial stakeholders (SIEMENS Project FACT, IBM Project VRIO). SPECTACLES (Autonomous Wearable Display Systems) in cooperation with Silhouette International, INSTAR (Information and Navigation Systems Through Augmented Reality) (2001-2003), Siemens München, AG, CT-SE-1, BISANTE, EU/IST, Broadband Integrated Satellite Network Traffic Evaluation (1999-2001), Peer-to-Peer Coordination (2001–), Siemens München, AG, CT-SE-2, Context Framework for Mobile User Applications (2001–), Siemens München, AG, CT-SE-2, WebWall, Communication via Public Community Displays, Connect Austria (2001-2002), VRIO, Virtual Reality I/O, with GUP JKU, IBM Upper Austria (2002-2003), MobiLearn, Computer Science Any-Time Any-Where, (2002-2004), Mobile Sports Community Services, (SMS Real Time Notification at Vienna City Marathon 1999, 2000, 2001, 2002; Berlin Marathon 2000, 2001, 2002), etc. Ferscha has published more than 150 technical papers on topics related to pervasive and distributed computing.

He has served on editorial boards of renowned international scientific journals (e.g. Pervasive and Mobile Computing (Elsevier), Transactions of the Society for Computer Simulation), on steering and programme committees of several conferences like PERVASIVE, UMBICOMP, ISWC, WWW, PADS, DIS-RT, SIGMETRICS, MASCOTS, MSWiM, MobiWac, TOOLS, Euro-Par, PNPM, ICS, etc. to name a few. His activities and recognition in the Pervasive Computing and Wearable Computing research communities is expressed by e.g. his chairing PERVASIVE 2004 (Programme Chair), and ISWC’09 (General Chair). In the parallel and distributed simulation community he e.g. served as the General Chair of the IEEE/ACM/SCS 11th Workshop on Parallel and Distributed Simulation (PADS’97), as Program Committee chair for the PADS’98, Program Chair for the Seventh International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS’99), the 12-th IEEE International Symposium on Distributed Simulation and Real Time Applications (DS-RT 2008), or the 13th International Symposium on Wearable Computers (2009) in Linz, Austria. Currently he is involved in the program committees of the major related research and FET conferences /e.g. FET11 in Budapest), and chairing DOA-SVI 12.

Alois Ferscha is an active consultant to the IST FET group within the Commission of the European Communities, Information Society and Media Directorate-General, and to the Austrian bm-wf and bm-vit. He is Austria’s representative in IFIP TC-10 (International Federation for Information Processing, TC10 - Computer Systems Technology).

As an invited researcher or guest professor he was visiting the Dipartimento di Informatica, Universita di Torino, Italy, at the Dipartimento di Informatica, Universita di Genoa, Italy, at the Computer Science Department, University of Maryland at College Park, College Park, Maryland, U.S.A., and at the Department of Computer and Information Sciences, University of Oregon, Eugene, Oregon, U.S.A.

Alois Ferscha is member of the OCG, GI, ACM, IEEE and holds the Heinz-Zemanek Award for distinguished contributions in computer science, the Cross Border Award 2009, the “Innovationspreis 2009” and the "Innovationspreis" of the "Multimedia Staatspreis 2011".