

TEC-Lab

Technology-Enhanced Communication laboratory

Profile and Projects

November 2006



1. Profile

TEC-Lab (Technology-Enhanced Communication laboratory) is a research laboratory established in February 2001 within the Faculty of Communication Sciences of the University of Lugano.

The mission of TEC-Lab is to develop **theoretical** and **applied research** on the different areas concerning how **communication** can be enhanced and supported by the use of **advanced technologies** and **interactive media**.

To this end, the approach of TEC-Lab is strongly **multidisciplinary**, bridging and borrowing research approaches from various research arenas, practical expertises and disciplines, including communication, learning and education, cultural heritage, project management, new media, design and engineering, thus building a comprehensive view, where results are obtained by overcoming the necessary narrowness of each mono-disciplinary point of view.

In this perspective, the range of research areas includes:

- **Requirements analysis:** investigation on models and methodologies for supporting the activities of capturing, analyzing, tracing and representing the needs and communication goals of users and all stakeholders in complex interactive communication projects. One of the key results of this basic research is the definition of methodologies (AWARE and TRAMA) specifically oriented to the analysis and traceability of the requirements.
- **New media & interaction design:** definition of models, paradigms and processes for the design of the user experience for complex, content-intensive, hypermedia interactive applications, with a particular emphasis on information architecture. One of the key results stemming from this research, in collaboration with the Politecnico di Milano, is a dialogue-based design method (IDM - Interactive Dialogue Model), which allows expressing the design of the user experience in an usable, agile and yet accurate fashion.
- **Quality and usability:** exploration of models and approaches for evaluating and measuring the quality of an interactive application, with particular emphasis on usability and on the success of the user experience. The laboratory, in collaboration with the Politecnico di Milano, has developed a systematic usability evaluation method called MILE+, which combines inspection methods and user testing, thus providing agile yet comprehensive conceptual tools for effectively identifying usability breakdowns and documenting the findings of a usability analysis.
- **Accessibility and eInclusion:** finding conceptual tools for modeling “aural” interactive systems, i.e. applications to be mainly listened to instead of being looked at. This research has a strong impact on the advancement of techniques for designing “accessible” applications, specifically targeted to people with visual disabilities. In this realm, TEC-Lab is committed to define advanced guidelines for accessible design, taking into account the complexity of the issue and overcoming the “easy” (but partial) technical solutions currently offered by international standards and public policies.

The above research areas are investigated in a variety of specific "vertical" domains, including **Cultural heritage, Healthcare, eCommerce and eLearning**.

2. Current Research Projects

DELOS: Network of Excellence on Digital Libraries

EU 6th Framework Program, IST Programme, G038 -507618

2004-2008

Digital Libraries (DL) have been made possible through the integration and use of a number of IC technologies, the availability of digital content on a global scale and a strong demand for users who are now online. They are destined to become essential part of the information infrastructure in the 21st century. The DELOS network intends to conduct a joint program of activities aimed at integrating and coordinating the ongoing research activities of the major European teams working in Digital Library - related areas with the goal of developing the next generation Digital Library technologies.

www.delos.info

EPOCH Network on Excellence in Processing Open Cultural Heritage

EU 6th Framework Program, IST Programme, 507382

2004-2008

The overall objective of the EPOCH network is to provide a clear organisational and disciplinary framework for increasing the effectiveness of work at the interface between technology and the cultural heritage of human experience represented in monuments, sites and museums. This framework encompasses all the various work processes and flows of information from archaeological discovery to education and dissemination. It allows the identification of bottlenecks in the end-to-end process and this in turn allows prioritisation of where the research focusses should lie.

www.epoch-net.org

OPERA - Online Personal Education and Risk Assessment

CancerBACKUP, King's Fund, in collaboration with HCC-Lab, University of Lugano.

2005-2007

This project aims at the creation of an online risk assessment tool in relation to genetic breast cancer risk. The TEC-Lab develops the interaction design of the tool and the technological framework, whereas the HCC-Lab (Health-care communication laboratory of USI) is responsible for handling the structuring, refining, and presenting the information. The main objective is to structure information within an effective argumentative setting which meets the needs of individual users, enabling them to understand their level of risk and the corresponding explanation and recommendations.

COMPACT: An Online Communication Platform for Cancer Patients at the Hospital of Locarno

Fondazione San Salvatore, in collaboration with HCC-Lab, University of Lugano.

2006-2007

The purpose of the project is to design and implement an informative online platform on cancer issues. People know that the Internet is used more and more to research health information, but often this information is neither reliable nor easy to understand. In collaboration with Centro Triangolo in Locarno, TEC-Lab, in collaboration with HCC-Lab aims at building an online platform which could be useful for patients and their families to find understandable information and answer the most frequently asked questions on cancer topics.

USABLE - USability Analysis through Blended Learning

Swiss Virtual Campus, S-3-002

2004-2007

The USABLE project developed a blended learning course on how to evaluate the usability of web applications. The target public are students in computer science and communication sciences (both in the universities and universities of applied sciences) as well as professionals in the new media and electronic publishing industry. Thanks to a dedicated e-learning environment, students gained hands-on experience in carrying out real usability evaluations of existing websites, by applying selected evaluation methodologies. The project is coordinated by the Institut für Hygiene und Arbeitsphysiologie of ETHZ and by the TEC-Lab The Human Computer Interaction Group at the EPFL provides its experience on interface usability and the Dipartimento Tecnologie Innovative of SUPSI exploits USABLE modules in its curriculum.

www.usableproject.net

CATCH: CommunicAtion Technologies for Cultural Heritage

Swiss Virtual Campus, P-4-032

2005-2007

CATCH developed a blended learning course on the use of advanced communication technologies in cultural heritage. The target public are students in communication sciences, in computer sciences and cultural-heritage related disciplines. The course is structured in 5 core modules emphasizing case studies and best practices in the use of advanced technologies (interactive applications and 3D environments) for an effective valorization and communication of cultural heritage (experiences of museum and cultural institutions and research labs in the area of archaeology communication, and cultural tourism). The project is coordinated by TEC-Lab. The second partner is MiraLab of the University of Geneva, which provides its expertise on the use of 3D technology for communicating cultural heritage. University of Basel contributes with a specific module on antiquities in cultural heritage, thus providing an insight for understanding with concrete examples what cultural heritage may be and what are its implications.

www.catchproject.net

MAPS - “Marketing Activities for the Promotion of Syrian Cultural Heritage, Ministry of Tourism/Directorate of Museum and Antiquities - Syrian Arab Republic”

EU Cultural Tourism Development Program, 01/2005 EC 119756 EUROP-AID, in partnership with HOC Laboratory, Politecnico di Milano.

2005-2006

TEC-Lab has collaborated with the Politecnico di Milano, under the EU program for the development of tourism in the mediterranean basin, in a project aiming at enhancing the communication/marketing strategies and tool of the Syrian Ministry of Tourism, with particular emphasis on the promotion of cultural tourism in Syria. TEC-Lab collaborated to the re-design of the Ministry of Tourism website, to the development of new interactive sections, as well to the online referencing and promotion.

3. Past Research Projects

MEDINA: MEDiterranean by INternet Access

EU 6th Framework Program, EUMEDIS Programme, # 314, in partnership with HOC Laboratory, Politecnico di Milano.
2002-2006

MEDINA is formed by a Consortium of seventeen partners - among which national and regional tourism offices, ministries of culture and tourism, universities and private corporations - from fourteen countries in the Mediterranean area. The purpose of the project is, on the one hand, to promote the culture of the partner countries in the Mediterranean basin; on the other hand, to emphasise and to outline their common cultural background and to tie and harmonise them in a number of interesting ways. The project set up a technical and organizational infrastructure capable of developing and maintaining activities to promote Mediterranean culture-oriented tourism through ICT tools. In particular, MEDINA developed a web-based “application framework”, that is, a set of web applications belonging - in terms of design concepts - to the same “family” and able to promote Mediterranean cultural tourism at different levels and for different typologies of users.

www.medinaproject.net

AURA – AURal Access

Regione Campania (Italy), in partnership with Politecnico di Milano, HOC Laboratory
2004-2006

The AURA (AURal Access) project aims at defining a methodological and technological framework that enables the design and development of web-based “aural” applications, in which the audio channel becomes the main or the only communication channel. The main results of the AURA framework are:

1. the AURA model (UML-based) describing the aural/semantic structure of web pages and the corresponding reading strategies.
2. the VPML language (XML-based) allowing to represent the aural/semantic structure of pages.
3. a set of Interaction Primitives defining the communication language between the users and the aural pages.
4. the PAGE READER software architecture, allowing the users to access and interact with aural pages

AURA’s results are crucial in building applications for visually impaired users and for all those situations in which it is difficult or impossible to look at a screen (e.g. portable devices).

UWA - Ubiquitous Web Applications

EU 5th Framework Program, IST Programme, IST-2000-25131
2001-2003

The main objective of UWA is to define a set of methodologies, notations, and tools to support the design of complex multi-device ubiquitous web applications. In addition, the project addresses the needs for standard design and documentation to improve the possibility for exchanges and interoperability. The results of the project is suite of models including specific techniques for requirements elicitation and analysis, design models for characterizing multi-channel and mobile applications, as well as a set of tools supporting these development activities.

VNET 5: Advancing user-centred product creation in interactive electronic publishing

EU 5th Framework Program, IST Programme, IST-2000-25465

2001-2003

The VNET5 Network is a support action which aims to advance the level of maturity of user-centred product creation and user validation in electronic publishing projects by: a) promoting user-centred product creation and a common approach to user validation; b) raising the level of skills and competence of user-centred product creation and validation in IST projects; c) analysing generic requirements for user acceptance of electronic information products and services; d) documenting and disseminating resources for user-centred product creation and validation.

www.vnet5.org

ELEN: A Network of E-Learning Centres

EU Socrates Programme – Action Minerva, 101421-CP-1-2002-1-CY-MINERVA

2002-2004

The main objective ELEN is the definition of e-learning design patterns, roadmaps and usability evaluation of e-learning platforms. This has been done by creating a network of E-Learning Centers and leading organisations in the learning technologies. The E-LEN network supports a diverse constellation of learning centres around the world, have a strong capacity for developing and delivering pedagogically-informed technology for effective e-learning experiences and disseminate these experiences to other institutions. The output of E-LEN is the publication of a number of reports and guides on various organisational, pedagogical and technical issues related to e-learning and e-learning centers.

WeD – Web as a Dialogue

Swiss National Science Foundation, FNSRS 105211-102061/1

2003-2005

The goal of WED is to develop a framework for interpreting the user interaction with a website as a dialogue. The methodology is based on studying the dynamics of the web dialogue using proven dialogue analysis techniques (based on linguistic theories) coupled with systematic web design methodologies in the domain of cultural-heritage communication.

As key results, innovative web design models based on dialogic primitives have been developed and tested; guidelines and tools to support effective oral dialogues via the web have also been conceived. The investigation of the success factors for a web dialogue also enabled to improve existing technologies and design techniques for web accessibility via the aural channel (especially for visually-impaired users).

www.tec-lab.ch/wed

e-LE.AR.ning CHANNEL PROJECT: Analysis of the impact of the ICT on the wooden furniture industry

Interreg III Italian-Swiss programme, in collaboration with NewMineLab, University of Lugano.

2003-2005

The project is a result of a joint study carried out by CLAC and USI, TEC-Lab on the use of new communication and information technologies (ICT) in small to medium businesses in the wooden furnishings sector. The aim of the project is to raise awareness among business owners and managers on how the impact of new communication technologies can affect the relationship between Producers of the Wood Furnishings System (in the province of Como) and the Distributing businesses (in Italian-speaking Switzerland) and how these instruments affect and modify commercial relationships in an area which is characterised by a very high level of commercial trading (between the Comasco and Canton Ticino areas).

HELP: Listen to a Web Site

EU Culture Programme, in partnership with Politecnico di Milano, HOC Laboratory.

2002-2003

HELP aims to provide visually impaired users with accessibility to cultural heritage information. Within the project, advanced design guidelines and methodologies for optimizing accessibility to information-intensive websites have been developed. In particular, they have been considered and tested during the realization of the Munch's exhibition website.

www.munchundberlin.org

OPENDRAMA: The digital heritage of opera in the open network environment

EU 5th Framework Program, IST Programme, IST-2001- 28197, in partnership with Politecnico di Milano, HOC Laboratory.

2001-2003

OpenDrama aims at the definition, development and integration of a novel platform to deliver rich cross-media digital objects of opera and other vocal dramatic music, opening this heritage to a dimension of learning, exploring and entertainment. The OpenDrama service provides a composite and multichannel experience through a number of multimedia interactive devices such as PC, PDA, interactive TV, etc. Each channel provides a "user experience" satisfactory on its own, while the "ensemble" should provide a global experience, capable of reaching a variety of users in different situations.

<http://www.iaa.upf.es/mtg/opendrama/>

3. Publications

1. International Journal Papers

- 1.1 Bolchini, D., Paolini, P., **Interactive Dialogue Model: a Design Technique for Multi-Channel Applications**, IEEE Transactions on Multimedia, Vol. 8, No. 3 June 2006.
- 1.2 Perrone, V., Bolchini, D., **Designing Communication-Intensive Web Applications: Experience and Lessons from a Real Case**, on International Journal of Computer Science & Technology (IJCS&T), 5 (2) 2005.
- 1.3 Bolchini, D., Paolini, P., **Designing Interactive Communication: Insights from the Cultural-Heritage Domain**, Guest Editors' Introduction to the Thematic Section on "*User-Centered Communication Design for Interactive Applications*", Studies in Communication Sciences, 5 (1) 2005, 1-8.
- 1.4 Lepori, B., Bolchini, D., **Usability analysis for Research Information Systems: a usable approach and practical guidelines**, Studies in Communication Sciences, 5 (1) 2005.
- 1.5 Bolchini, D., Yu, E., **Modelling User Requirements for Web Applications**, Studies in Communication Sciences, 4 (2) 2004.
- 1.6 Antón, A.I., Earp, J.B., Bolchini, D., He, Q., Jensen, C., Stufflebeam, W., **The Lack of Clarity in Financial Privacy Policies and the Need for Standardization**, IEEE Security & Privacy, 2 (2) 2004.
- 1.7 Bolchini, D., Paolini, P., **Goal-Driven Requirements Analysis for Hypermedia-intensive Web Applications**, Requirements Engineering Journal, Springer, RE03 Special Issue (9) 2004: 85-103.
- 1.8 Bolchini, D., **Goal-Based Web Design**, Studies in Communication Sciences, Special Issue "New Media In Education", 3 (1) 2003.

2. Peer-reviewed International Conference Proceedings

- 2.1 Bolchini, D., Colazzo, S., Paolini, P., Vitali, D., **Aural Information Architectures**, in Proc. ACM 24rd International Conference on Design of Communication (SIGDOC 2006), ACM Press, Myrtle Beach, Florida, October 2006.
- 2.2 Bolchini, D., Inversini, A., Cantoni, L., Guttormsen, S., **Teaching Usability Online: the USABLE experience**, Proc. ED-MEDIA 2006 World Conference on Educational Multimedia, Hypermedia & Telecommunications, Orlando, Florida, June 2006.
- 2.3 Speroni, M., Paolini, P., Bolchini, D., **Museum Websites Interface Elements: Do users understand them?**, in Proc. Museums&Web Conference 05, Albuquerque, New Mexico, USA, 2006.
- 2.4 Bolchini, D., **Capturing Visions and Goals to Inform Communication Design**, in Proc. ACM 23rd International Conference on Design of Communication (SIGDOC 2005), ACM Press, Coventry, September 2005.

- 2.5 Perrone, V., Bolchini, D., Paolini, P., **A Stakeholders Centered Approach for Conceptual Modeling of Communication-Intensive Applications**, in Proc. ACM 23rd International Conference on Design of Communication (SIGDOC 2005), ACM Press, Coventry, September 2005.
- 2.6 Bolchini, D., Randazzo, G., Speroni, M., Gobbetti, D., **IDM – A User-Centred Model Shaping User Interaction as a Dialogue**, in Proc. HCII 2005 International Conference on Human-Computer Interaction, Las Vegas, USA, 2005.
- 2.7 Bolchini, D., Colazzo, S., **Guidelines for Describing Usability Problems**, in Proc. HCII 2005 International Conference on Human-Computer Interaction, Las Vegas, USA, 2005.
- 2.8 Triacca, L., Randazzo, G., Bolchini, D., **Improving Prototype-based Usability: Lessons-learned from the Opendrama Case Study**, in V. Cappellini et al. (Eds). Proc. EVA 2005 International Conference on Electronic Imaging & the Visual Arts, Florence, 2005.
- 2.9 Perrone, V., Bolchini, D., Rastellini, A., Dragone, L., **Shaping Requirements for Institutional Web Applications: Experience from an Industrial Project**, accepted for publication in Proc. 13th IEEE International Conference on Requirements Engineering, Paris (France), 2005.
- 2.10 Bolchini, D., Qingfeng, H., Anton, A., Stufflebeam, W., **“I need it now”: Improving Website Usability By Contextualizing Privacy Policies**, in Proc. International Conference on Web Engineering ICWE’04, Munich, Germany, May 2004.
- 2.11 Bolchini, D., Arasa, D., Cantoni, L., **Teaching Websites as Communication: A “Coffee Shop Approach”**, in L. Cantoni & C. McLoughlin (Eds). Proc. ED-MEDIA 2004 World Conference on Educational Multimedia, Hypermedia & Telecommunications, Lugano, Switzerland, June 2004.
- 2.12 Speroni, M., Fiordelli, M., Randazzo, G., Garzotto, F., Bolchini, D., **Medina (Mediterranean by Internet Access): an EU-funded Project for Promoting Mediterranean Cultural Tourism through ICT**, in V. Cappellini et al. (Eds). Proc. EVA 2004 International Conference on Electronic Imaging & the Visual Arts, Florence, 2004.
- 2.13 Capodieci, A.B., Di Blas, N., Paolini, P., Speroni, M., Bolchini, D., **Reading Web pages to Visually-Impaired People**, in V. Cappellini et al. (Eds). Proc. EVA 2004 International Conference on Electronic Imaging & the Visual Arts, Florence, 2004.
- 2.14 Triacca, L., Bolchini, D., Botturi, L., Inversini, A., **MiLE: Systematic Usability Evaluation for E-learning Web Applications**, in in L. Cantoni & C. McLoughlin (Eds). Proc. ED-MEDIA 2004 World Conference on Educational Multimedia, Hypermedia & Telecommunications (*Winner of an Outstanding Paper Award*), Lugano, Switzerland, June 2004.
- 2.15 Lepori, B., Bolchini, D., **Usability analysis for CRIS: some examples and practical guidelines**, in A. Nase & G. Van Grootel (Eds). Proc. CRIS 2004 Current Research Information Systems Conference, Antwerp, Belgium, May 2004.
- 2.16 Bolchini, D., Mylopoulos, J., **From Task-Oriented to Goal-Oriented Web Requirements Analysis**, in T. Catarci et al. (Eds). Proc. International Conference on Web Information System Engineering (WISE’03), Rome, Italy, 2003.

- 2.17 Bolchini, D., Randazzo, G., Paolini, P., **Adding Hypermedia Requirements to Goal-Driven Analysis**, in Proc. 11th IEEE International Conference on Requirements Engineering, Monterey (CA), USA, 2003 (*selected among the best conference papers for extended publication on Requirements Engineering Journal, see publication 1.7*).
- 2.18 Bolchini, D., Triacca, L., Speroni M., **MiLE: a Reuse-Oriented Usability Evaluation Method for the Web**, in C. Stephanidis & J. Jacko (Eds). Proc. HCI 2003 International Conference on Human-Computer Interaction, Crete, Greece, 2003.
- 2.19 Bolchini, D., Cantoni, L., Triacca, L., **Website Usability and Quality of Web Communication**, in Proc. of 5th Association for Business Communication (ABC) European Convention, Lugano, Switzerland, 2003.
- 2.20 Triacca, L., Bolchini, D., DiBlas, N., Paolini, P., **Wish You Were Usable! How to Improve the Quality of a Museum Web site**, in V. Cappellini et al. (Eds). Proc. EVA 2003 International Conference of Electronic Imaging and the Visual Arts, Florence, Italy, 2003.
- 2.21 Bolchini, D., Paolini, P., **Goal-oriented Requirements Specification For Digital Libraries**, in M. Agosti & C. Thanos (Eds). Proc. of ECDL European Conference on Digital Libraries 02, Research and Advanced Technology for Digital Libraries, Springer, 2002.
- 2.22 Cantoni, L., Bolchini D., **Computer Mediated Collaboration in an Academic Setting. An Experience on Web Business Models at the University of Lugano (Switzerland)**, in P. Barker & S. Rebelsky (Eds.), ED-MEDIA 2002 World Conference on Educational Multimedia, Hypermedia & Telecommunications, Denver, Colorado, 2002.
- 2.23 Di Blas, Paolini, Speroni M., Capodieci C. **Enhancing accessibility for visually impaired users: the Munch's exhibition** Proc. Museums and the Web Conference, Arlington, USA, April 2004.
- 2.24 Di Blas N., Paolini P., Speroni M. **Web Accessibility for Blind Users Towards Advanced Guidelines** . Proc. UI4ALL Conference (User Interfaces for All), Vien, 2004.
- 2.25 Di Blas N., Paolini P., Speroni M **Listen to a website: accessibility (beyond current standards) and a market opportunity** In Proc. of the International Conference on Interactivity in Museums - ICHIM03, Paris, September 2003".

3. Peer-reviewed International Workshop Proceedings

- 3.1 Bolchini, D., Colazzo, S., Paolini, P., **Requirements for Aural Web Sites**, in Proc. of the 8th IEEE International Symposium on Web Site Evolution, Philadelphia, USA, September 2006.
- 3.2 Speroni, M., Bolchini, D., **Semiotic Design Patterns in Websites**, in Proc. Workshop on HCI design patterns, INTERACT 2005 International Conference, Rome, September, 2005.
- 3.3 Triacca, L., Inversini, A., Bolchini, D., **Evaluating Web Usability with MiLE+**, in Proc. Web Site Evolution Workshop 2005 (WSE 2005), Budapest, September 2005.
- 3.4 Bolchini, D., Paolini, P., Speroni, M., **Usable Accessibility for DL: Advances and Research Agenda**, in Proc. International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS 2005), Montreaux, Switzerland, 2005.

- 3.5 Bolchini, D., Paolini, P., Speroni, M., **Multi-channel Design Techniques for a Successful User Experience**, in J. Trant and D. Bearman (eds.). Museums and the Web 2005: Proceedings, Toronto: Archives & Museum Informatics, www.archimuse.com/mw2005/papers/bolchini/bolchini.html.
- 3.6 Perrone, V., Bolchini, D., **Designing Communication-intensive Web Applications: a Case Study**, in Proc. VII Workshop on Requirements Engineering, WER'04, December 2004, Tandil, Argentina.
- 3.7 Bolchini, D., Paolini, P., **Dialogue-based Design for Multichannel Interactions**, in M. Matera & S. Comai (Eds). Engineering Advanced Web Applications, Proc. of Workshops in Connection with the 4th International Conference on Web Engineering ICWE'04, Munich, Germany, May 2004.
- 3.8 Bolchini, D., **Crafting Salient Web Scenarios Using Priorities**, in Proc. of 6th Workshop on Requirements Engineering WER'03, Piracicaba, Brazil, 2003.
- 3.9 Bolchini, D., Paolini, P., **Capturing Web Application Requirements through Goal-oriented Analysis**, in Proc. of 5th Workshop on Requirements Engineering WER'02, Valencia, Spain, 2002.

4. Project Papers and Posters

- 4.1 Bolchini, D., **User-Centered Strategies for Enhanced DL Accessibility**, Seventh International Workshop of the EU Network of Excellence DELOS on Audio-Visual Content And Information Visualization In Digital Libraries (AVIVDiLib'05), Cortona, Italy, May 4-6, 2005.
- 4.2 Bolchini, D., Paolini, P., **A Dialogue-Driven Design Model For Multi-Channel Digital Libraries**, Seventh International Workshop of the EU Network of Excellence DELOS on Audio-Visual Content And Information Visualization In Digital Libraries (AVIVDiLib'05), Cortona, Italy, May 4-6, 2005.
- 4.3 UWA Consortium, **The UWA Approach to Modeling Ubiquitous Web Applications**, in Proceedings of the 2002 IST Mobile & Wireless Telecommunications Summit, Thessaloniki (Greece), June 2002.
- 4.4 UWA Consortium, **Ubiquitous Web Applications**. in Proceedings of e-2002, e-business and e-work, Prague (Czech Republic), October 2002.
- 4.5 VNET5 Consortium, **User-centred Development for Cultural Heritage Applications: the VNET5 approach**, in Proceedings of EVA 02 Conference, Florence, 2002.

6. International Book Contributions

- 6.1 Torlone, R., Barbieri, E., et al. **Methods and Tools for the Development of Adaptive Applications**, in Pernici, B. (Ed.) *Mobile Information Systems – Infrastructure and Design for Adaptivity and Flexibility*, Springer 2006.

7. Books in Italian

- 7.1. Cantoni, L., Di Blas, N., Bolchini, D., **Comunicazione, Qualità, Usabilità**, Apogeo, Milano, 2003.
- 7.2. Paolini, P., Mainetti, L., Bolchini, D., **Progettare Siti Web e Applicazioni Mobili**, McGraw-Hill Italia, 2006. (*English version in preparation*)