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# IUI'17 Workshop Summary for SmartLearn - Intelligent Interfaces for Ubiquitous and Smart Learning

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**Abstract**

New technologies are changing the way we learn and teach. Emerging technologies such as social semantic web, cloud computing, and the growing popularity of mobile devices, embedded devices and adaptive context-aware technologies are leading to a paradigm shift in the way educational services are provided. Through technologies and approaches such as ubiquitous and adaptive learning, learning becomes personalized, flexible, and suitable to meet diverse and rapidly changing technologies, environments and learner needs, while opening unprecedented possibilities for education. The aim of the "Intelligent Interfaces for Ubiquitous and Smart Learning" workshop has been to bring together researchers from industry and academia to address the challenges of the intelligent user interfaces and smart learning fields, discuss new ideas and present their research to the scientific community in order to enhance the methodologies and techniques for intelligent learning environments for the 21st century. The workshop program, program committee and further details are available on the website (<http://smartlearn.dibris.unige.it/>).

**Author Keywords**

workshop; smart educational interfaces; interactive learning environments; mobile learning; ubiquitous learning; technology-enhanced learning; intelligent tutoring systems; user-adapted systems; personalized interaction; user modelling; social and semantic technologies; recommender systems; cloud technologies; intelligent interfaces

**ACM Classification Keywords**

H.5.m [Information Interfaces and Presentation (e.g., HCI)]: Miscellaneous; H.5.2 [User Interfaces]: Evaluation/Methodology, User-Centered Design; H.5.3[group and Organization Interfaces]: Evaluation/Methodology; K.8.0 [Personal Computing]: Games; K.3.1Computer Uses in Education: Computer-assisted instruction (CAI)

**Introduction**

The SmartLearn workshop has brought together researchers and practitioners of the education community with the experts and researchers of the HCI and AI in order to shape the next generation of online and ubiquitous education services.

The evolution of social semantic educational environments and learning content personalization, along with the adoption of context-aware techniques, the spread of handheld devices together with always connected IoTs, and of cloud computing are deeply changing the way people are using the Web and digital devices for learning. This change is also pushing education providers to offer a new wave of learning services. Learners want to freely access learning content as they prefer, anytime and anywhere, according to their personal study, work or special

needs. We are moving towards educational models where people build their competences and skills individually, such as in massive open online courses. People are now accustomed to mobile devices and require applications that fit and exploit this modality of interaction even more.

Smart and ubiquitous learning is an emerging field that aims to address all these needs and requirements of 21st century education systems, whether it is formal, informal or continuing education. Smart learning environments include context-aware ubiquitous learning, mobile learning, adaptive and personalized learning, along with other new technologies and methods related with natural user interfaces, augmented reality, serious games for education and training.

In the research community, these themes are steadily growing and gaining popularity, as shown by related conferences and workshops, such as the International Conferences on Smart Learning Environments, Smart Learning Ecosystems and Regional Development, Learning Technology for Education in Cloud, Smart Education and e-Learning, Ubiquitous Intelligence and Computing, Pervasive and Ubiquitous Computing, and plenty of international workshops.

**Workshop Format and Output**

The workshop consisted of a keynote speech by an invited speaker followed by Q&A and discussion, two main sessions for the presentation of the accepted full and position papers, and a roundtable discussion session among participants. The keynote speech has been delivered by Peter Brusilovsky, one of the pioneers and leading figures of Adaptive Hypermedia,

Adaptive Web, and Web-based Adaptive learning, on open social student modelling. A total of eight papers, three long and five position, on diverse fields of smart and ubiquitous learning environments and models have been accepted for presentation at the workshop and for inclusion in the proceedings. Papers covered topics from the use of sensors to gamification, use of tangible user interfaces, semantic geographical maps, virtual reality, recommender systems, motivation modelling, assistive learning tools, smartphones and crowdsourcing in order to enhance learning and to propose solutions for special education needs and learning disabilities.

### Participants

The workshop received submissions catching the interest of the wide Education, AI and HCI communities, who are working on the new paradigms on technology-enhanced learning, especially those from the field of smart learning environments including adaptive and personalized learning, mobile learning, smart communities, ITSs, context-aware ubiquitous learning, cloud-based learning, semantic technologies, recommender systems, user modelling, and social learning.

### Organizing Committee

This section presents the short bios of the workshop organizers:

- Ilknur Celik (<http://www.metu.edu.tr/~cilknur>) is a faculty member and co-coordinator of the Computer Education and Instructional Technology Program at Middle East Technical University Northern Cyprus Campus. Her principal research interests lie in the area of Adaptive Hypermedia, Web-based

Educational Systems, Interoperability, User Modelling, Personalization, Adaptive Systems, Semantic Web, Technology-Enhanced Learning and Social Web. She has served as a program committee member and chair in several international and national conferences and workshops.

- Iliaria Torre (<http://www.dibris.unige.it/en/component/publicdibris/?view=staffdettagli&id=279>) is a faculty member of the Department of Computer Science, Bio-engineering, Robotics and Systems Engineering at the University of Genoa, where she is in charge of the Research Program on Technology-Enhanced Learning & Digital Humanities. Her research focuses on semantic and social technologies, web of things, user-adapted interfaces and technology-enhanced learning. Over the years, she has been a member of several program committees of conferences and workshops and chair of workshops and doctoral programs.