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Computer Supported Collaborative Work

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Computer Supported Collaborative Work is an exciting research field. The original research themes have been changing in time and new areas have appeared in recent years. However, research has always been close to applications. The Collaboration Researchers' International Workshop (CRIWG) has been held every year since 1995. This conference is special in various aspects, including the provision of ample time to present each paper, so that the issues can be discussed in depth. That feature has attracted authors who want to receive significant feedback to continue their research work. The 21st version of CRIWG was held in Yerevan, Armenia, September 22-25, 2015. Following a tradition, the authors of the best papers of the conference were invited to submit significantly extended, improved versions of their contributions to be considered for a journal special issue. For this version of the conference, the accepted papers would be published in a special issue of J.UCS, as we had done for another version of the conference in the past. Furthermore, there was a J.UCS open call so that any author could also submit papers on the "Computer Supported Collaborative Work" subject. A total of 11 papers – including invited and submitted after the open call - were rigorously reviewed by three qualified reviewers each and 8 papers passed this first round. All selected papers have been revised by their authors and subject to a new review round, which in some cases meant new changes by the authors. The final papers are presented in this issue.

The first paper by "Crowdsourcing and Co-curation in Virtual Museums: A Practice-driven Approach" by Daniel Biella, Thomas Pilz, Daniel Sacher, Benjamin Weyers, Wolfram Luther, Nelson Baloian and Tobias Schreck refers to crowdsourcing and co-curation in virtual museums. The paper gives an overview of the subject which will be useful to researchers and practitioners. It also presents interesting examples which are very illustrative of the issues of crowdsourcing, co-creation and co-curation in museums. In particular, the paper includes case studies on restoring lost or damaged

artwork by the sculptor Leopold Fleischhacker, high-quality 3D shapes and Armenian cross stones. The paper also reports on an evaluation in the field of usability, user interfaces and the crowd's willingness to undertake various co-curation subtasks.

The second paper "A Steady-State Evolutionary Algorithm for Building Collaborative Learning Teams in Educational Environments Considering the Understanding Levels and Interest Levels of the Students" by Virginia Yannibelli, Marcelo Armentano and Analía Amandi addresses the problem of forming learning groups and proposes a new algorithm called "steady-state evolutionary algorithm". This algorithm organizes the students taking a given course into teams in such a way that the two grouping criteria of the problem are optimized. This method is evaluated by the simulations in nine different conditions and compared with the particle swarm optimization algorithm. The results present the very high-quality sets of teams for each of the nine data sets.

The third paper entitled "Providing Behavior Awareness in Collaborative Project Courses" by Esunly Medina, Roc Meseguer, Sergio F. Ochoa, and Humberto Medina discusses design, computer-supported environment including data capture, processing and visual feedback provision, as well as the implementation and evaluation of a behavior awareness mechanism (BAM) in the context of collaborative learning tasks. The calculation of five collaborative behavior features considered in BAM is based on weighted means of metrics of the students' data traces collected from different sources. The Personal Awareness Component (PAC) visualizations include two subcomponents to represent the students' overall and specific collaborative behavior features. A proof-of-concept evaluation with people enrolled in an undergraduate software engineering course indicates that BAM is useful and comprehensible to provide aggregate feedback about the students' behavior and performance.

The fourth paper entitled "Anchored Discussion: Development of a Tool for Creativity in Online Collaboration" by Georg J.P. Link, Dominik Siemon, Gert-Jan de Vreede and Susanne Robra-Bissantz discusses the design and evaluation of a system to foster creative online collaboration through the support of anchored discussions. The experiment revealed that anchoring is an adequate tool to structure an ideation process and has the potential to enhance performance. Also, the results suggest that anchored discussion leads to better overall ideas and that groups using anchored discussion are working in a more structured way.

The fifth paper "Introducing a Collaborative Tool Supporting a Learning Activity Involving Creativity with Rotation of Group Members" by Gustavo Zurita, Nelson Baloian, José A. Pino and Mary Boghosian describes a pedagogical activity to identify requirements that users have in a common bus stop in Santiago de Chile. The experiment was conducted with 19 students of a fourth-year 'Technology Information' undergraduate course inside the classroom and supported by a collaborative application called Sketchpad which runs on wirelessly interconnected tablet PCs. Sketchpad realizes principles of collaboration and externalization using brain sketching, promoting the development and practice of creativity. Accordingly, the paper discusses the meaning of the notion 'creativity', explores ways of stimulating it in learning activities; then the authors evaluate to what extent Sketchpad fosters creativity and collaboration. The main research question is about a difference in students' perception when they have or not to rotate among the various groups. To

collect information about the contribution of Sketchpad to creativity in both scenarios, the authors use a closed questionnaire based on the Creativity Factor Evaluation (CSI) with a limited number of open questions to evaluate the interaction among participants.

The sixth paper "Context-aware and Personalization Method based on Ubiquitous Learning Analytics" by Kousuke Mouri, Hiroaki Ogata, Noriko Uosaki, and Erdenesaikhan Lkhagvasuren presents a ubiquitous learning system called SCROLL that could recommend relevant supplementary materials to individual learners at the right place in the right time based on their locations and the learning logs of previous learners. An experiment was conducted to evaluate the students' perceptions of the usefulness of the proposed system. The study showed that the recommendations are appropriate in terms of their level, context and preferences for learners and increase the learning opportunities.

The seventh paper authored by Osmel Bordiés and Yannis Dimitriadis describes CSCL design process of explicit artifact flow. The research question is defined as "how do teachers designers perceive the effort required by modeling CSCL scenarios with explicit definition of artifact flow?" The empirical study, reported in this paper and grounded on mixed methods, provides evidence of the effort overload when teachers are involved in designing CSCL situations in a controlled environment. Findings also suggest that further research and development work should be carried out with the objective to adapt and enhance existing authoring tools in order to reduce the perceived effort, when artifact flow is defined.

Finally, in their paper "Automatic Synchronization between Local and Remote Video Persons in Dining Improves Conversation", Yasuhito Noguchi and Tomoo Inoue refer to the subject of improving the scenario for making people eat meals and share a conversation with other people who are also eating but presented on a video. This could be useful for people who have difficulties to enjoy daily family communication in real time, because of time-zone differences or life-rhythm differences. The authors study a previous proposal to synchronize the video message with the viewer by changing its playback speed in order to improve the communication. In particular, they study the influence of the synchronization method by a Wizard of Oz (WoZ) and by a prototype system. The study found that the synchronization via WoZ increased speech frequency, decreased the duration of switching pauses, and led to a higher ratio of eating actions immediately after verbal responses of the user. This showed that a more active commitment of the user was observed. The prototype system also achieved comparable results, indicating the feasibility of a videoconferencing system with such an implementation.

The Computer Supported Collaborative Work field is exciting with its many challenges and applications. The enclosed papers edited by us reflect this excitement. We hope you will find this selection as inspiring as we do, and that it encourages you to get involved in this field.

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