Editorial

Peter Brusilovsky and Mike Sharples

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WELCOME to the last 2014 issue of *IEEE Transactions on Learning Technologies*. This issue completes the seventh year of journal publication with seven papers devoted to a range of innovative learning technologies.

Two papers represent a growing interest in embodied learning and the design of technologies to train physical skills. In "A Novel Approach to the Diagnosis of Motor Skills", Altor Aguirre and colleagues describe an Intelligent Interactive Learning System that combines virtual reality and educational technologies. A motion capture system based on Microsoft Kinect sends data on a person's body motion, represented as a series of movement arcs, to a semantic subsystem that transforms these into verbal descriptions. The team conducted a study of the effectiveness of the system in diagnosing problems in tennis serves of novice tennis players. The results show that the system is able to detect component movements and to diagnose whether these are performed correctly, to a high level of accuracy.

The paper "Self-help Training System for Nursing Students to Learn Patient Transfer Skills" by Zhifeng Huang and colleagues describes and evaluates a system that also uses Microsoft Kinect, along with color markers on the body, to monitor trainee nurses as they undertake a procedure to transfer a patient from bed to wheelchair. The system provides feedback to the nurse at the end of the transfer procedure, based on a checklist of correct body positions and movements. A controlled study with five nurses in each condition found significant gains in performance for the nurses trained with the system compared to those who learned from a textbook and training video.

A different type of embodied learning is addressed in the paper by Kai-Yi Chin, Zeng-Wei Hong, and Yen-Lin Chen titled "Impact of Using an Educational Robot-based Learning System on Students' Motivation for Elementary Education". They describe a system that enables a teacher to program a small toy robot to move in coordination with presentation of classroom multimedia materials. The aim is to motivate children to engage with the teaching material. The teacher manages the lesson, but the children are encouraged to address answers to the robot which performs actions such as waving to attract attention or clapping to express happiness. The research team conducted a controlled study in two elementary school classrooms that showed significant gains in post-test scores by children in the robot-equipped classroom compared one where the teacher used PowerPoint and audio for teaching.

The paper by Christopher Brinton and colleagues investigates factors associated with the decline over time of activity on discussion forums for massive open online courses (MOOCs). They carried out a linear regression analysis to explore forum activity over time, and also developed a unified generative model for the discussion threads to find efficient thread classifiers and rank the relevance of threads. One finding from the regression study was that if teaching staff participate in MOOC forums, this is associated with more discussion, but the volume of discussion still declines at the same rate as with no teacher intervention. The generative model enabled keywords to be extracted from the forum discussions and the relevance of discussion threads to be computed. The broader aim of the analysis is to find ways to reduce the decline in forum activity and to recommend appropriate forum threads to learners who re-join a course.

A team of researchers from Open University of Catalonia—David Bañeres, Robert Clarisó, Josep Jorba and Montse Serra—present an innovative approach to support learning of digital circuit design, by providing automatic validation and feedback for students' designs. This technology is serving as the core of a self-study system named VerilUOC that is introduced in the paper "Experiences in Digital Circuit Design Courses: A Self-Study Platform for Learning Support". The paper also presents an evaluation of VerilUOC, which demonstrates improved performance and positive attitudes among the students using the system.

The paper "Semantic Similarity Measures for the Generation of Science Tests in Basque" by Itziar Aldabe and Montse Maritxalar explores the application of Natural Language Processing techniques (NLP) to automate generation of multiple-choice questions (MCQ). The main focus of the paper is on generation of meaningful but challenging distractors. To determine the best approach for generating distractors that are conceptually similar to the correct answer, the authors explore and combine several NLP approaches. The results of study reported in the paper demonstrate that technology developed by the authors could help experts in the generation of MCQ.

The paper "Understanding Social OER Environments—a Quantitative Study on Factors Influencing the Motivation to Share and Collaborate" by Henri Pirkkalainen, Jussi P. P. Jokinen and Jan M. Pawlowski explores problems on the crossroads of two popular learning technology trends—open educational resources (OER) and social computing. The authors argue that a range of challenges can hinder the motivation of teachers to share and collaborate in OER. To uncover the

critical factors the authors review the literature on the subject and perform a large-scale study using data collection and factor analysis. The results suggest that language and cultural barriers are the best predictors of lack of motivation while a lack of organizational support and quality concerns also hinder the motivation, although not as strongly.

Enjoy your reading!

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