Editors: H. Fujita, J. Sasaki

Selected Topics in Education & Educational Technology

9th WSEAS International Conference on Education and Educational Technology (EDU '10)

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Hamido Fujita, Jun Sasaki

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Preface

This year the 9th WSEAS International Conference on EDUCATION and EDUCATIONAL TECHNOLOGY (EDU '10) was held at the Iwate Prefectural University, Japan, October 4-6, 2010. The conference remains faithful to its original idea of providing a platform to discuss educational software and development, distance learning and distance teaching, multimedia for education, web-based education, e-school and e-university, e-learning and e-pedagogy etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Teaching Digital Citizenship

Professor Lesley S. J. Farmer
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Abstract: State and national legislation is mandating responsible digital competency for all ages. Educators need to develop and deliver technology-based curriculum that addresses how learners can effectively and responsibly access, assess, use, share and produce digital information as well as contribute positively to the digital world. This presentation showcases engaging, interactive curriculum, learning objects, and learning activities for K12 school communities.

Brief Biography of the Speaker:
Dr. Lesley Farmer, Professor at California State University Long Beach, coordinates the Librarianship program. She earned her M.S. in Library Science at the University of North Carolina Chapel Hill, and received her doctorate in Adult Education from Temple University. Dr. Farmer has worked as a teacher-librarian in K-12 school settings as well as in public, special and academic libraries. She chaired the Education Section of the Special Libraries Association, and is the International Association of School Librarianship Vice-President of Association Relations. A frequent presenter and writer for the profession, Dr. Farmer's research interests include information literacy, collaboration, and educational technology. Dr. Farmer's most recent book is Technology Management Handbook for School Library Media Centers, published by Neal-Schuman in 2009.

Plenary Lecture 2

Mechatronic Education - An Important Way to Improve the Technological Education for Young People in Romania

Professor Luciana Cristea
Department of Precision Mechanics and Mechatronics
"Transilvania" University of Brasov
Romania
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Abstract: The Mechatronics is the synergetic combination of precision mechanical engineering, electronic control and systems thinking in the design of products and processes. Mechatronics as a highly interdisciplinary domain involves sensors, actuators, data bases, system modelling, locomotion, system control and data acquisition. In Mechatronics there is a need to develop interdisciplinary programs to better prepare graduates to design, build, and operate the products and systems of today and tomorrow. The European Commission recognises that meeting the Lisbon challenge requires to rethink education and training to promote efficient and optimal learning. The tasks and the problems solving in mechatronics requires cognitive and operational knowledge and practical experience about building systems, diagnosis and maintenance-techniques. Any education programme that aims to be useful and to support the local industry has to have a balance between academic and practical work. The curricula in the Mechatronics field, developed according to European standards, have to assure high performances in design, manufacturing, services, and research, performances perfectly matched with the needs of highly computerized society.

Brief Biography of the Speaker:
Prof. Dr. Eng. Luciana CRISTEA is professor in the Department of Precision Mechanics and Mechatronics from "Transilvania" University of Brasov-Romania, coordinator of the Precision Mechanics Specialization, coordinator of the research department "High-precision Mechanical Products and Mechatronic Systems" from "Transilvania" University of Brasov, coordinator of the Conceiving Division of Products Testing-Assessment and Quality Guarantee (CATEPAC) – SAVAT Platform. She has been involved in the research activity since 1988 (as a scientific researcher at ICSITROA Brasov and as a member of the teaching and researching staff at the "Transilvania" University Brasov). She participated in 32 research contracts, in 17 as a coordinator, from 1990 up to date. She published 9 books in consecrated publishing houses (1 book in an international publishing house), 12 university courses and manuals, 148 scientific papers in the field of Precision Mechanics and Mecahtronics and is the author of 3 inventor patents. She is PhD coordinator since 2004.
Since 2008, Professor Luciana CRISTEA is the Head of the Department of Precision Mechanics and Mechatronics from "Transilvania" University of Brasov-Romania;
Domains of interest: Precision mechanics and mechatronics, Control and serving automat systems, Technologies and systems of dimensional inspection and serving; Optimisation of supplying, transportation, and dosing systems utilized in control automates fabrication, Structural improvement of automatic Microsystems, Mechanical engineering.
Former approached research domains: Fabrication, forming operations, and industrial control using robots and automatic instalations (1990-92); Research and simulation of supplying, dosing and transportation systems utilised in industrial automatisations for optimisation (1994-96); Structural improvement and modernizing of automatic dimensional control systems designated to re-technologisation and assembly organs production quality guarantee (1988-2002); Modular conceiving of automatic dimensional control systems for control equipment optimisation and re-technologisation, and products quality guarantee (2002-2006); Conceiving products testing-assessment and quality guarantee (2005-2006); Miniatural robotic system with reconfiguration and self-multiplication abilities (2006-2008).
She is member of the Romanian General Association of Engineers (AGIR), funding Member of the Romanian Association of Precision Mechanics and Optics (AMFOR) and Funding Member of the Romanian Society of Mechatronics (SROMECA).

Plenary Lecture 3

Flexible Learning in Developing Regions

Professor Love Ekenberg
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Abstract: Education is a key area for development at an individual, community, national- and international level. Skilled people are employable and thereby generate their own professional identities, businesses and livelihoods. Although efficient and large-scale education is vital for building up stable knowledge economies, many countries have weak educational structures and lack basic resources. However, indiscriminate acceptance and use of e-learning can increase the digital divide rather than reduce it. In this talk, we discuss emerging issues from which we develop theoretical assumptions aimed at suitable approaches for effective adoption and utilization of e-learning to support teaching and learning processes. In particular, we present some recent initiatives for efficient e-learning undertaken by Dept. of Computer and Systems Sciences at Stockholm University (DSV).

Brief Biography of the Speaker:
Ekenberg has been working with development cooperation (EU, World Bank, Sida, WHO, Swedish Ministry of Foreign Affairs), including technical infrastructure development, IT policies and organization development as well as human resources. Ekenberg has been project leader, manager and coordinator of around 20 major national and C:\Program Files (x86)\Eudora\attach\liten xlove ekenberg.jpginternational projects and has authored or co-authored over 150 peer-reviewed journal and conference papers as well as three books. Ekenberg is Full Professor in Computer and Systems Sciences at Stockholm University, Full Professor of Information Systems at The Swedish Royal Institute of Technology as well as Guest Professor in Computer Science at Mid Sweden University. He has a Ph.D. in Computer and Systems Sciences as well as a Ph.D. in Mathematics. He his currently head of Dept. of Computer and Systems Sciences at Stockholm University, consisting of around 200 employees, 80 PhD students and handling around 4500 undergraduate students.

Plenary Lecture 4

Web Mining – An Effective Method in Course Development and Learning Management

Professor Imre J. Rudas
President of Obuda University, Hungary
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Professor Peter Toth
Director of Centre for Engineering Education
Obuda University, Hungary
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Abstract: The development of e-Learning, the use of Learning Management System and Learning Content Management System are becoming more and more dominant in engineering education, especially since "caned" solutions are easy to "configure" for desired purposes. However, the quality issue is only a second criterion in development process, making content and conventional teaching strategies to be the main issue. The two main criterion is "content and form" – the precise pedagogic aims, didactic structure and suitably tailored environment. Apart from these, we should also evaluate the customs of accessing the system and course pages of users, both tutors and learners. Thus we obtain some usability indicators by usage of web mining methods in order to recognize and understand the users' activities and behavior, to identify learning strategies and problems in virtual learning environment. By this approach the web mining method accommodates organically to a development model of virtual learning environment. This presentation shows such indicators and their relationship to the efficiency and the effectiveness of virtual courses.

Brief Biography of the Speakers:

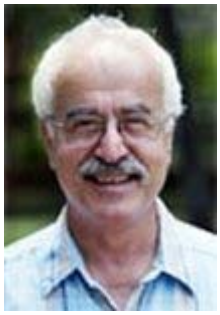
H Prof. Dr. Imre J. Rudas graduated from Banki Donat Polytechnic, Budapest in 1971 and received the Master Degree in Mathematics from the Eotvos Lorand University, Budapest while the Ph.D. in Robotics from the Hungarian Academy of Sciences in 1987. He is active as the President of Obuda University and as a professor of John von Neumann Faculty of Informatics. Prof. Rudas is a Fellow of IEEE, Administrative Committee member of the Industrial Electronics Society, member of the International Board of the Robotics & Automation Society, Chairman of the joint Hungarian Chapter of these Societies, and RAS and IES Chapter Coordinator of Region 8. He is also a registered expert of the United Nations Industrial Development Organization and the EU. He is the President of the Hungarian Fuzzy Association and Steering Committee Member of the Hungarian Robotics Association and the John von Neumann Computer Society. Prof. Rudas serves as an associate editor of IEEE Transactions on Industrial Electronics, member of editorial board of Journal of Advanced Computational Intelligence and Control Engineering Practice, member of various national and international scientific committees. He is the founder of the IEEE International Conference Series on Intelligent Engineering Systems Prof. Rudas was the General Co-chair of ICAR2001, and also serves as General Chairman and Program Chairman of numerous scientific international conferences. His present areas of research activity are: Robot Control, Soft Computing, Computed Aided Process Planning, Fuzzy Control and Fuzzy Sets. Prof. Rudas has published more than 280 papers in various journals and international conference proceedings.

Dr. Peter Toth Peter is Professor of Centre for Engineering Education at Obuda University, Hungary where he is participating in technical initial teacher training and in-service training courses. Currently he is a director of the Centre. He earned his MSc in Engineering Education at the Budapest University of Technology and Economics, and Peter Toth has Ph.D degree in Educational Research from Eotvos Lorand University. He plays leading role in planning, development and managing traditional and virtual engineering programs. Dr. Toth is doing research on pedagogy of virtual learning environment, improvement of problem-solving thinking and analyzing of spatial abilities in engineering education. His actual research area is analysis of students' activities and behavior in virtual learning environment by web mining methods.

He has been contributing in some European researches and projects on pedagogical aspects of e-learning and development of creativity and abilities of future engineers and teachers as well. He is member of Committee for Teacher Training of Hungarian Rectors' Conference and secretary of Informatics Section of Pedagogical Committee of Hungarian Academy of Sciences. Dr. Toth has issued about 60 papers in several journals and conference proceedings.

Plenary Lecture 5

Teaching STEM Courses with Virtual Reality based Course Delivery System



Professor M. Nasseh Tabrizi
Director of Graduate Studies
Director of Technology Innovation Lab
Department of Computer Science
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Abstract: We report our findings of an NSF funded study (Tabrizi, PI; Farwell, CoPI; Russell, CoPI) assessing the effectiveness of the Agent Based Virtual Reality (AVR) delivery system used to deliver STEM education at East Carolina University. Our preliminary review of the collected data shows the system is effective at supporting student learning and aiding faculty in meeting their learning objectives for individual courses. Additionally, our initial data gathered and redistributed to us by an independent data gathering organization for fall 2009 and spring 2010 deployment of the AVR system, indicate significant increase in student learning as measured by pre and post testing in classes as broadly distributed as: networking, biotechnology, statistics, technology law and technical writing.

Brief Biography of the Speaker:
Tabrizi received his B.S. degree in Computer Science from Manchester University, UK. He then completed his M.S. and Ph.D. from Automatic Control and Systems Engineering Department, Sheffield University, UK. Tabrizi worked in Manchester University for two years prior to his appointment at East Carolina University in 1984. He is the Graduate Program Director of Computer Science and founder and director of Software Engineering program at East Carolina University. His research interests are in the areas of Virtual Reality, Modeling and Simulation, Computer Vision, Signal and Image Processing, Software Engineering Education, Internet and Multimedia, Assistive Technologies, and Computer Science Education. Tabrizi and his research team have prototyped different project in his Technology Innovation lab including Archival Data Extraction and Assessment (ADEAP) system, electronic medical records management, an agent and virtual reality-based course delivery system, RFID based learning assessment system, and virtual reality based home inspection and training system. Tabrizi has participated on several major grants. His research team is involved in creation of innovative technologies including the recent one on development of multi-touch table top screen. Tabrizi publications include diverse areas of research in computer science, technology, and software engineering. He was named ECU's scholar teacher in 2000 and has received best paper award.