

# **12th IASTED International Conference on Computers and Advanced Technology in Education 2009**

**(CATE 2009)**

**St. Thomas, U.S. Virgin Islands  
22-24 November 2009**

**Editors:**

**V. Uskov**

**ISBN: 978-1-61567-897-6**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2009) by ACTA Press  
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact ACTA Press  
at the address below.

ACTA Press  
B6 Suite 101  
2509 Dieppe Avenue SW  
Calgary, Alberta T3E 7J9  
Canada

Phone: (403) 288-1195  
Fax: (403) 247-6851

[www.actapress.com](http://www.actapress.com)

# TABLE OF CONTENTS

## MOBILE LEARNING

<b>672-013: Developing Informal Education through Mobile Collaborative Learning</b> .....	1
<i>J. C. dos Reis, R. Bonacin, M. C. Martins</i>	
<b>672-031: Development and Evaluation of the Flower Identification Database for Mobile with a Geo-Tagged Picture Map</b> .....	8
<i>H. Miyata, M. Ishigami, M. Sannomiya, E. Matsushita</i>	
<b>672-041: Flying WiFi Robots as Mobile Research Platforms</b> .....	14
<i>K. Henke, St. Ostendorff, Th. Volkert, A. Mitschele-Thiel</i>	
<b>672-072: Copyright Protection for Vocabulary Learning Materials</b> .....	22
<i>H. Lee, K. Kaneko, M. Ishikawa, H. Miyakoda</i>	

## COLLABORATIVE LEARNING

<b>672-027: A Moodle Extension for Supporting Workflow-Driven Collaborative Learning</b> .....	30
<i>R. Perez-Rodriguez, M. Caeiro-Rodriguez, L. Anido-Rifon</i>	
<b>672-054: Assessment of Learning in Concerto III: A Collaborative Learning Support System Based on Question-Posing</b> .....	36
<i>Y. Hirai, A. Hazezama, T. Inoue</i>	
<b>672-070: Supporting Learning Communities through a Lifecycle in a Serious Games Context: Requirements for Social Tools</b> .....	44
<i>E. Prasolova-Førland, L. M. Hokstad</i>	
<b>672-038: Networked Virtual and Remote Laboratories for Research Collaboration in Natural Sciences and Engineering</b> .....	50
<i>S. Jeschke, E. Hauck, O. Pfeiffer, T. Richter</i>	

## FACULTY DEVELOPMENT, COURSEWARE, AND CURRICULUM ISSUES

<b>672-011: AgentBased Intelligent Courseware Generation in e-Learning Systems</b> .....	57
<i>A. Grubišić, S. Stankov, V. Glavinić</i>	
<b>672-053: Enabling Teachers to Provide New Learning Environments</b> .....	66
<i>B. Ask, H. Haugen</i>	
<b>672-068: A Visualization Enhanced Hypertextbook for Computer Science Education</b> .....	74
<i>C. Hill, B. Slator</i>	
<b>672-040: Visual Analysis of Online Test Logs for Instructional Improvement</b> .....	81
<i>H. Inoue, K. Yasutake, T. Sumiya, O. Yamakawa, T. Tagawa, S. Hirokawa</i>	
<b>672-039: Online Distance Learning for Francophone Teachers and School Principals</b> .....	87
<i>C. IsaBelle, H. Fournier, E. Duplâa</i>	
<b>672-049: A Quantifiable Approach in Strategic and Operational Planning in Educational Institutions</b> .....	94
<i>V. Pougatchev</i>	

## ADVANCED TEACHING AND LEARNING TECHNOLOGIES

<b>672-043: Personalisation of e-Learning Content via Metadata</b> .....	102
<i>A. Diab, H.-D. Wuttke</i>	
<b>672-032: Evaluation of Learner Engagement in Program Visualization</b> .....	107
<i>E. Kaila, M.-J. Laakso, T. Rajala, T. Salakoski</i>	
<b>672-028: A New Dimension for SCORM Compliant Online Courses</b> .....	115
<i>X. Wang, Y. E. Shih, F. Li, S. Shih</i>	
<b>672-030: Design and Implementation of Virtual Networking Experiment System</b> .....	121
<i>X.-L. Han, G. Chen, W.-X. Zhang, C.-S. Huang</i>	
<b>672-006: ICT Supported Engineering Course - Case Study and Guidelines</b> .....	129
<i>J. Rutkowski, K. Moscinska</i>	

<b>672-002: Embedding Reflective Agent in Educational Simulation Games</b> .....	137
<i>X. Bai</i>	
<b>672-007: Improving Predictions of Student Performance Using a Fuzzy Prediction System</b> .....	144
<i>E.-T. Yeoh, P. Woods</i>	

### **SOFTWARE SYSTEMS, VIRTUAL REALITY, AND VIRTUAL LABS**

<b>672-004: Power Transformer Virtual Reality Based on MAS</b> .....	149
<i>G. Zheng, F. Dai</i>	
<b>672-035: A DVD Movie-based Call System Enabling Control of Learner Environment via the Web</b> .....	153
<i>T. Okura, T. Koyama, J. Noguchi, A. Iwasaki</i>	
<b>672-047: A Digital Environment Dedicated to Distributed and Cooperative Practical Activities</b> .....	158
<i>J.-P. Gerval, D.-M. Popovici, A. Assoum, Y. Le Ru, M. Polceanu</i>	
<b>672-050: Improving the Level of Knowledge Acquisition by Technology Enhanced Learning</b> .....	163
<i>D. D. Burdescu, M. C. Mihăescu, C. M. Ionascu, B. Logofatu</i>	
<b>672-067: Simulating Ethical Dilemmas: Teaching Ethics through Immersive Virtual Environments</b> .....	169
<i>Y. Wang, A. Dudley, J. Braman, G. Vincenti</i>	
<b>672-071: Teaching Diagnostic Modeling of Digital Systems with Decision Diagrams</b> .....	176
<i>R. Ubar, J. Raik, D. Mironov, T. Evertson, M. Aarna, E. Orasson, H.-D. Wuttke</i>	
<b>672-017: Embedded Laboratory Instruction: C8051F330-GP and the ISPM4A5-64/32</b> .....	182
<i>D. R. Wilcox, S. E. Wilson, G. W. Wöstenkühler</i>	
<b>672-073: A Web-based Factorial Experiment Testing System (FETS): A Pilot Study</b> .....	187
<i>N. W. Schlecht, P. McClean, B. Slator</i>	

### **BEST PRACTICES IN TECHNOLOGY-BASED EDUCATION**

<b>672-057: Design and Implementation of Digital Forensics Labs: A Case Study for Teaching Digital Forensics to Undergraduate Students</b> .....	193
<i>H. Chi, E. L. Jones, C. Chatmon, D. Evans</i>	
<b>672-065: Web 2.0 as an Enabler of Developing Open Content Online Hypertextbooks</b> .....	198
<i>T. A. Yang, V. S. Jadhav, D. Chipade, B. Sun</i>	
<b>672-036: Engaging Students in STEM Careers with Project Based Learning - MarineTech Project</b> .....	206
<i>A. K. Verma, S. E. McKinney</i>	
<b>672-066: Social Networking as a Social and Cultural Reconfiguration: A Case Study of AcesaSP</b> .....	213
<i>B. Passarelli, C. Pontes Freire, J. Kiyomura Moreno</i>	
<b>672-058: 21st Century Game Design: A Model and Prototype for Promoting Scientific Problem Solving</b> .....	219
<i>R. Van Eck, W. Hung, F. Bowman, S. Love</i>	
<b>672-048: Technology of Learning Process Construction in Adaptive Systems of Distance Learning</b> .....	228
<i>P. Fedoruk</i>	
<b>672-060: Module-based Courseware for Teaching Secure Wireless Sensor Networks</b> .....	231
<i>B. Sun, L. Osborne, T. A. Yang</i>	
<b>672-003: The United States' Challenges in Science and Engineering Education: The Hispanic Factor</b> .....	239
<i>H. Kettani</i>	
<b>672-018: Fast Prototyping of Learning Experiences: An Attempt of Modelling</b> .....	245
<i>U. Barchetti, A. Bucciero, L. Mainetti</i>	

### **RESEARCH ON TECHNOLOGY-BASED EDUCATION**

<b>672-052: Applying the Artifact Development Analysis to the Optimal Development of Means for Learning</b> .....	252
<i>M. Kurosu</i>	
<b>672-014: C, Java, Ruby: A Student Experience</b> .....	260
<i>R. Eggen, S. Rumancik, M. Eggen</i>	
<b>672-062: Exploring the Usage of Web 2.0 and Associated Communication Tools in Professional Learning</b> .....	264
<i>A. Jerman-Blažič, F. Novak, B. Jerman-Blažič</i>	

<b>672-081: Impact of Hypermedia Resource VeTIC on Ethno Linguistic Vitalization and Inclusion in Franco-Ontarian Schools .....</b>	<b>271</b>
<i>L. Weatherall, A.Gélinas Proulx, C. IsaBelle</i>	

## **SYMPOSIUM ON HUMAN-COMPUTER INTERACTION-(HCI 2009)**

### **USABILITY AND DESIGN**

<b>673-015: Investigating Perception of Vibration Directions in Touchscreens .....</b>	<b>277</b>
<i>Y. Liu</i>	
<b>673-016: Proposal of a Protocol to Support Product Usability Evaluation .....</b>	<b>282</b>
<i>Y. P. C. Aguiar, M. F. Q. Vieira</i>	
<b>673-009: Visual Exploration of Complex Information Spaces based on Cluster Analysis.....</b>	<b>290</b>
<i>T. Smaoui, C. Müller-Schloer</i>	
<b>673-026: A GUI Wizard for Developing Command &amp; Control Applications in CAVE.....</b>	<b>301</b>
<i>S. Buntha, M. Muhanna, S. Okamoto, S. Dascalu, F. C. Harris</i>	
<b>673-025: Audio-Tactile Location Markers: Accessible Real-World Tagging for the Blind.....</b>	<b>309</b>
<i>R. Schlögl, M. Tomitsch, C. Wimmer, T. Grechenig, K. Kappel</i>	
<b>673-032: In-Tic Project: A New Assistive Technology for Children with Cerebral Palsy to Computer Access.....</b>	<b>318</b>
<i>T. Pousada, B. Groba, L. Nieto, I. Mourellos, A. Moreiras, J. Pereira, A. Pazos</i>	
<b>673-033: A Force Estimation Method Based on Deformation of an Object Using a High-Speed Camera .....</b>	<b>322</b>
<i>Y. Tanaka, T. Tsuji, M. Shiokawa</i>	

### **APPLICATIONS**

<b>673-029: Designing Interactive Voice Response (IVR) Interfaces: Localisation for Low Literacy Users .....</b>	<b>328</b>
<i>A. Sharma Grover, O. Stewart, D. Lubensky</i>	
<b>673-010: Formants Analysis of American, Australian and British Accents.....</b>	<b>336</b>
<i>J. Chupan, M. Asadina, S. Ghorshi</i>	
<b>673-007: Improvement of the Guilin-Hills Myoelectric Signal Classifier for Prostheses Control under the Influence of Fatigue.....</b>	<b>342</b>
<i>S. Herrmann, K. Buchenrieder</i>	
<b>673-035: Key Disciplines in Multimodal User Interface Development with Interaction Design .....</b>	<b>348</b>
<i>D. Ertl, R. Popp, M. Vallée</i>	
<b>673-008: Tag-based Interaction with Large High-Resolution Displays.....</b>	<b>356</b>
<i>S. Thelen, J. Meyer, A. Middel, P.-S. Olech, A. Ebert, H. Hagen</i>	
<b>673-030: Illuminance Adaptive Marker-based Mixed Reality with HDR Processing.....</b>	<b>364</b>
<i>Y. Yasumuro, S. Yamazaki, M. Fuyuki</i>	
<b>Author Index</b>	