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Intelligent Tutoring Systems

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Proceedings, Part II

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Preface

The 10th International Conference on Intelligent Tutoring Systems, ITS 2010, continued the bi-annual series of top-flight international conferences on the use of advanced educational technologies that are adaptive to users or groups of users. These highly interdisciplinary conferences bring together researchers in the learning sciences, computer science, cognitive or educational psychology, cognitive science, artificial intelligence, machine learning, and linguistics. The theme of the ITS 2010 conference was *Bridges to Learning,* a theme that connects the scientific content of the conference and the geography of Pittsburgh, the host city. The conference addressed the use of advanced technologies as bridges for learners and facilitators of robust learning outcomes.

We received a total of 186 submissions from 26 countries on 5 continents: Australia, Brazil, Canada, China, Estonia, France, Georgia, Germany, Greece, India, Italy, Japan, Korea, Mexico, The Netherlands, New Zealand, Pakistan, Philippines, Saudi Arabia, Singapore, Slovakia, Spain, Thailand, Turkey, the UK and USA. We accepted 61 full papers (38%) and 58 short papers. The diversity of the field is reflected in the range of topics represented by the papers submitted, selected by the authors. The most popular topics among the accepted (full and short) papers were: empirical studies of learning with advanced learning technologies (34 accepted papers), educational data mining (EDM) and machine learning (28), evaluation of systems (23), pedagogical agents (21), natural language interaction (20), affect (19), intelligent games (16), pedagogical strategies (15), models of learners, facilitators, groups and communities (15), and domain-specific: mathematics (15). Of course, many papers covered multiple topics.

We are delighted that five outstanding and world-renowned researchers accepted our invitation to give invited talks during the conference. Abstracts of their presentations are included in this set of proceedings. Chee-Kit Looi from the National Institute of Education (Singapore) shared insights into comprehensive initiatives in Singaporeís education system, which involve partnerships between researchers and classroom practice. Stacy Marsella from the Institute of Creative Technologies (University of Southern California) spoke about the role of emotion and emotion modeling in systems with virtual characters. Alexander Renkl from the University of Freiburg (Germany) suggested a way of reconciling theoretical views on learning held by proponents of socio-constructivist approaches with cognitively oriented approaches and discussed implications for the design of ITS. Steven Ritter from Carnegie Learning, Inc. (Pittsburgh, USA) spoke about the third wave of ITS, which takes advantage of the large user base of real-world ITS for purposes of data mining and end-user authoring. Finally, Beverly Woolf, from the University of Massachusetts, Amherst, described the emergence of social and caring computer tutors, which respond to both affect and cognition.

The proceedings contain 17 short papers within the important Young Researchers Track (YRT). This track represents the future of our field. It provides a forum in which PhD students present and discuss their work during its early stages, with mentoring from more senior members of the community. All submissions were carefully reviewed by experts. The proceedings also include 18 abstracts of Interactive Events that during the conference showcased an interesting mixture of mature systems and late-breaking developments in ITS and related tools for authoring, assessment, data analysis, etc. Rounding out the scientific program of the conference were six workshops and three tutorials.

All full papers and short papers included in the proceedings were stringently peer-reviewed. Reflecting the strength of the ITS community, we received a large number of submissions of very high quality. The review process rested significantly on the outstanding team of international experts from 24 countries who made up the Program Committee, the Senior Program Committee and the Advisory Board. Reviewers started the process by bidding on abstracts, ensuring that they were reviewing in areas of their particular interest and expertise. Conflicts of interest were identified so that no paper was assigned to a reviewer who is a close collaborator or colleague of any of the paper's authors. Each paper received at least three reviews. One of the reviewers was a member of the Senior Program Committee, who was also responsible for leading an online discussion of the paper and then writing a meta-review. Criteria for reviews of papers were: relevance, originality, significance, evaluation, related work, organization and readability. The final decisions for acceptance were made by the Program Co-chairs who, working in concert, carefully studied the reviews, discussion and meta-reviews, often initiating additional discussion among reviewers. In some cases, we (the Program Co-chairs) sought additional reviewers. For the most difficult decisions, we also read the papers. In making the hard decisions on accepting full papers, we were largely driven by the reviews and meta-reviews. Where the scores were close, we took into account all review criteria, and in our final decision weighed the relative importance of a paper's strengths and weaknesses. We also considered the different classes of contributions: for example, a full paper describing a new system designed to improve learning should include a sound evaluation or at minimum a convincing pilot study. For short papers, the novelty and potential of the work were key requirements. Due to the large number of high-quality submissions, our choices were difficult. This is a very pleasing situation for the ITS community and augurs well for the future as some of the papers we could not accept have the promise to be excellent future publications.

The quality of the reviews was extremely high, which was critical in enabling us to distinguish the highest quality work for acceptance as full papers. In addition, high-quality reviews are critical for researchers as feedback on their research and their papers, regardless of whether they are accepted for publication or not. For example, many reviews pointed to additional relevant literature, identified particular strengths and gave concrete advice on how to address weaknesses. We believe that authors of many of the rejected papers will be able to use this feedback to produce excellent papers in the future. We worked very hard to select the Program Committee, the Senior Program Committee and the Advisory Board so we could meet these goals. We are pleased to announce the following Outstanding Reviewer Awards: Ivon Arroyo,

Kevin Ashley, Ryan Baker, Joseph Beck, Gautam Biswas, Sydney d'Mello, Peter Brusilovsky, Vania Dimitrova, Neil Heffernan, Akihiro Kashihara, Brent Martin, H. Chad Lane, James Lester, Diane Litman, Rose Luckin, Stellan Ohlsson, Niels Pinkwart, Steven Ritter, Ido Roll, Carolyn Rosé, Peter Sloep, John Stamper and Gerhard Weber.

A scientific conference of the size of ITS 2010 can only succeed due to contributions of many people who generously donate their time. Of great significance are the contributions of the large number of people who helped with the review process: the Advisory Board, the Senior Program Committee, the Program Committee, as well as people who volunteered as reviewers. We are extremely grateful to them for the time and effort they put in. Special thanks are due to the people who volunteered to organize workshops and tutorials, which made up a key part of the scientific program of the conference. We also thank the Chairs for Workshops / Tutorials, Young Researcher Track / Doctoral Consortium, Interactive Events, and Panels, all of whom had a major influence on the scientific program. The Local Arrangements Chairs devoted countless hours of preparation to make the conference actually happen successfully "on the ground." The Volunteers / Outings Chairs recruited and organized dozens of students not only to help run the conference but to lead small-group outings tailored to individual interests in the ITS spirit. The Conference Treasurer organized our budget meticulously, the Sponsorship Chair increased it handsomely, and the Publicity Chair got the word out widely. Lynnetta Miller of Carnegie Mellon deserves special recognition for contributing in multiple guises (conference secretary, artist, webmaster). A special word of thanks is due to Carolyn Manley of Carnegie Mellon's Conference and Event Services, who among other things administered (along with programmer Alex Lang) the online registration system. We would like to thank Kevin Ashley, Vania Dimitrova, Ben du Boulay, Claude Frasson, Art Graesser, Alan Lesgold, James Lester, Roger Nkambou, Beverly Woolf, and other past organizers of ITS and AIED conferences for their kind assistance and sage advice. We are very grateful to Jo Bodnar of Carnegie Mellon and student volunteers Matthew Easterday, Richard Gluga, and Michael Lipschultz for the very significant role they played in assembling the proceedings. And we would like to thank our sponsors, listed later, whose support for the conference we gratefully acknowledge.

Our final thanks must be to the authors whose papers appear in these volumes. They have contributed many exciting new ideas and a comprehensive body of carefully validated work that will serve as an advanced technology bridge to improved learning in real educational settings.

April 2010

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Question Generation
Kristy Elizabeth Boyer and Paul Piwek

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Emmanuel G. Blanchard, W. Lewis Johnson, Amy Ogan and Danièle Allard

Supporting the Social Inclusion of Communities with Adaptive Learning Media
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Ari Bader-Natal, Erin Walker and Carolyn Rosé

Computer-Supported Peer Review in Education: Synergies with Intelligent Tutoring Systems
Ilya Goldin, Peter Brusilovsky, Christian Schunn, Kevin Ashley and I-Han Hsiao

Intelligent Tutoring Technologies for Ill-Defined Problems and Ill-Defined Domains
Collin Lynch, Kevin Ashley, Tanja Mitrovic, Vania Dimitrova, Niels Pinkwart and Vincent Aleven

Tutorials

Using DataShop to Analyze Educational Data
John Stamper

How to Apply Software Architecture and Patterns to Tutoring System Development?
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Seven Deadly Sins: Avoiding Several Common Statistical Pitfalls
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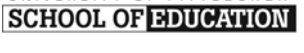

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Table of Contents – Part II

Affect 2

The Intricate Dance between Cognition and Emotion during Expert Tutoring 1
Blair Lehman, Sidney D'Mello, and Natalie Person

Subliminally Enhancing Self-esteem: Impact on Learner Performance and Affective State 11
Imène Jraidi and Claude Frasson

Detecting Learner Frustration: Towards Mainstream Use Cases 21
Judi McCuaig, Mike Pearlstein, and Andrew Judd

Educational Data Mining 2

Enhancing the Automatic Generation of Hints with Expert Seeding 31
John Stamper, Tiffany Barnes, and Marvin Croy

Learning What Works in ITS from Non-traditional Randomized Controlled Trial Data 41
Zachary A. Pardos, Matthew D. Dailey, and Neil T. Heffernan

Natural Language Interaction 2

Persuasive Dialogues in an Intelligent Tutoring System for Medical Diagnosis 51
Amin Rahati and Froduald Kabanza

Predicting Student Knowledge Level from Domain-Independent Function and Content Words 62
Claire Williams and Sidney D'Mello

KSC-PaL: A Peer Learning Agent 72
Cynthia Kersey, Barbara Di Eugenio, Pamela Jordan, and Sandra Katz

Authoring Tools and Theoretical Synthesis

Transforming a Linear Module into an Adaptive One: Tackling the Challenge 82
Jonathan G.K. Foss and Alexandra I. Cristea

An Authoring Tool to Support the Design and Use of Theory-Based Collaborative Learning Activities 92
Seiji Isotani, Riichiro Mizoguchi, Sadao Isotani, Olimpio M. Capeli, Naoko Isotani, and Antonio R.P.L. de Albuquerque

How to Build Bridges between Intelligent Tutoring System Subfields of Research 103
Philip Pavlik Jr. and Joe Toth

Collaborative and Group Learning 2

Recognizing Dialogue Content in Student Collaborative Conversation ... 113
Toby Dragon, Mark Floryan, Beverly Woolf, and Tom Murray

Supporting Learners' Self-organization: An Exploratory Study 123
Patrice Moguel, Pierre Tchounikine, and André Tricot

Exploring the Effectiveness of Social Capabilities and Goal Alignment in Computer Supported Collaborative Learning 134
Hua Ai, Rohit Kumar, Dong Nguyen, Amrut Nagasunder, and Carolyn P. Rosé

Intelligent Games 2

Virtual Humans with Secrets: Learning to Detect Verbal Cues to Deception 144
H. Chad Lane, Mike Schneider, Stephen W. Michael, Justin S. Albrechtsen, and Christian A. Meissner

Optimizing Story-Based Learning: An Investigation of Student Narrative Profiles 155
Seung Y. Lee, Bradford W. Mott, and James C. Lester

Integrating Learning and Engagement in Narrative-Centered Learning Environments 166
Jonathan P. Rowe, Lucy R. Shores, Bradford W. Mott, and James C. Lester

Intelligent Tutoring and Scaffolding 2

Collaborative Lecturing by Human and Computer Tutors 178
Sidney D'Mello, Patrick Hays, Claire Williams, Whitney Cade, Jennifer Brown, and Andrew Olney

Computational Workflows for Assessing Student Learning 188
Jun Ma, Erin Shaw, and Jihie Kim

Predictors of Transfer of Experimental Design Skills in Elementary and Middle School Children 198
Stephanie Siler, David Klahr, Cressida Magaro, Kevin Willows, and Dana Mowery

Young Researchers Track

Moodle Discussion Forum Analyzer Tool (DFAT) 209
Palak Baid, Hui Soo Chae, Faisal Anwar, and Gary Natriello

Peer-Based Intelligent Tutoring Systems: A Corpus-Oriented Approach 212
John Champaign and Robin Cohen

Intelligent Tutoring Systems, Educational Data Mining, and the Design and Evaluation of Video Games 215
Michael Eagle and Tiffany Barnes

An Intelligent Debater for Teaching Argumentation 218
Matthew W. Easterday

Multiple Interactive Representations for Fractions Learning 221
Laurens Feenstra, Vincent Aleven, Nikol Rummel, and Niels Taatgen

An Interactive Educational Diagrammatic System for Assessing and Remediating the Graph-as-Picture Misconception 224
Grecia Garcia Garcia and Richard Cox

Long Term Student Learner Modeling and Curriculum Mapping 227
Richard Gluga

Student Dispositions and Help-Seeking in Collaborative Learning 230
Iris K. Howley and Carolyn Penstein Rosé

Visualizing Educational Data from Logic Tutors 233
Matthew Johnson and Tiffany Barnes

An Authoring Language as a Key to Usability in a Problem-Solving ITS Framework 236
Jean-François Lebeau, Luc Paquette, Mikaël Fortin, and André Mayers

Towards the Creation of a Data-Driven Programming Tutor 239
Behrooz Mostafavi and Tiffany Barnes

Using Expert Models to Provide Feedback on Clinical Reasoning Skills 242
Laura Naismith and Susanne P. Lajoie

Algorithms for Robust Knowledge Extraction in Learning Environments 245
Ifeyinwa Okoye, Keith Maull, and Tamara Sumner

Integrating Sophisticated Domain-Independent Pedagogical Behaviors in an ITS Framework 248
Luc Paquette, Jean-François Lebeau, and André Mayers

Delivering Tutoring Feedback Using Persuasive Dialogues 251
Amin Rahati and Froduald Kabanza

Coordinate Geometry Learning Environment with Game-Like Properties 254
Dovan Rai, Joseph E. Beck, and Neil T. Heffernan

Long-Term Benefits of Direct Instruction with Reification for Learning the Control of Variables Strategy 257
Michael A. Sao Pedro, Janice D. Gobert, and Juelaila J. Raziuddin

Short Papers

Can Affect Be Detected from Intelligent Tutoring System Interaction Data? – A Preliminary Study 260
Elizabeth A. Anglo and Ma. Mercedes T. Rodrigo

Comparing Disengaged Behavior within a Cognitive Tutor in the USA and Philippines 263
Ma. Mercedes T. Rodrigo, Ryan S.J.d. Baker, Jenilyn Agapito, Julieta Nabos, Ma. Concepcion Repalam, and Salvador S. Reyes Jr.

Adaptive Tutorials for Virtual Microscopy: A Design Paradigm to Promote Pedagogical Ownership 266
Dror Ben-Naim, Gary Velan, Nadine Marcus, and Michael Bain

The Online Deteriorating Patient: An Adaptive Simulation to Foster Expertise in Emergency Decision-Making 269
Emmanuel G. Blanchard, Jeffrey Wiseman, Laura Naismith, Yuan-Jin Hong, and Susanne P. Lajoie

DynaLearn: Architecture and Approach for Investigating Conceptual System Knowledge Acquisition 272
Bert Bredeweg, Jochem Liem, Floris Linnebank, René Bühling, Michael Wißner, Jorge Gracia del Río, Paulo Salles, Wouter Beek, and Asunción Gómez Pérez

Interfaces for Inspectable Learner Models 275
Susan Bull, Andrew Mabbott, Rasyidi Johan, Matthew Johnson, Kris Lee-Shim, and Tim Lloyd

Conceptual Personalization Technology: Promoting Effective Self-directed, Online Learning 278
Kirsten R. Butcher, Tamara Sumner, Keith Maull, and Ifeyinwa Okoye

Learning to Identify Students' Relevant and Irrelevant Questions in a Micro-blogging Supported Classroom 281
Suleyman Cetintas, Luo Si, Sugato Chakravarty, Hans Aagard, and Kyle Bowen

Using Emotional Coping Strategies in Intelligent Tutoring Systems 285
Soumaya Chaffar and Claude Frasson

Showing the Positive Influence of Subliminal Cues on Learner's Performance and Intuition: An ERP Study 288
Pierre Chalfoun and Claude Frasson

Exploring the Relationship between Learner EEG Mental Engagement and Affect 291
Maher Chaouachi and Claude Frasson

MiBoard: Creating a Virtual Environment from a Physical Environment 294
Kyle Dempsey, G. Tanner Jackson, and Danielle S. McNamara

Players' Motivation and EEG Waves Patterns in a Serious Game Environment 297
Lotfi Derbali and Claude Frasson

Predicting the Effects of Skill Model Changes on Student Progress 300
Daniel Dickison, Steven Ritter, Tristan Nixon, Thomas K. Harris, Brendon Towle, R. Charles Murray, and Robert G.M. Hausmann

Data Mining to Generate Individualised Feedback 303
Anna Katrina Dominguez, Kalina Yacef, and James R. Curran

In the Zone: Towards Detecting Student Zoning Out Using Supervised Machine Learning 306
Joanna Drummond and Diane Litman

Can We Get Better Assessment from a Tutoring System Compared to Traditional Paper Testing? Can We Have Our Cake (Better Assessment) and Eat It too (Student Learning during the Test)? 309
Mingyu Feng and Neil Heffernan

Using Data Mining Findings to Aid Searching for Better Cognitive Models 312
Mingyu Feng, Neil T. Heffernan, and Kenneth Koedinger

Generating Proactive Feedback to Help Students Stay on Track 315
Davide Fossati, Barbara Di Eugenio, Stellan Ohlsson, Christopher Brown, and Lin Chen

ITS in Ill-Defined Domains: Toward Hybrid Approaches 318
Philippe Fournier-Viger, Roger Nkambou, Engelbert Mephu Nguifo, and André Mayers

Analyzing Student Gaming with Bayesian Networks 321
Stephen Giguere, Joseph Beck, and Ryan Baker

EdiScenE: A System to Help the Design of Online Learning Activities 324
Patricia Gounon and Pascal Leroux

Critiquing Media Reports with Flawed Scientific Findings: *Operation ARIES*! A Game with Animated Agents and Natural Language Trialogues 327
Art Graesser, Anne Britt, Keith Millis, Patty Wallace, Diane Halpern, Zhiqiang Cai, Kris Kopp, and Carol Forsyth

A Case-Based Reasoning Approach to Provide Adaptive Feedback in Microworlds 330
Sergio Gutierrez-Santos, Mihaela Cocea, and George Magoulas

Real-Time Control of a Remote Virtual Tutor Using Minimal Pen-Gestures 334
Yonca Haciahmetoglu and Francis Quek

Theoretical Model for Interplay between Some Learning Situations and Brainwaves 337
Alicia Heraz and Claude Frasson

Cultural Adaptation of Pedagogical Resources within Intelligent Tutorial Systems 340
Franck Hervé Mpondo Eboa, François Courtemanche, and Esma Aïmeur

An Interactive Learning Environment for Problem-Changing Exercise ... 343
Tsukasa Hirashima, Sho Yamamoto, and Hiromi Waki

Towards Intelligent Tutoring with Erroneous Examples: A Taxonomy of Decimal Misconceptions 346
Seiji Isotani, Bruce M. McLaren, and Max Altman

The Efficacy of iSTART Extended Practice: Low Ability Students Catch Up 349
G. Tanner Jackson, Chutima Boonthum, and Danielle S. McNamara

Expecting the Unexpected: Warehousing and Analyzing Data from ITS Field Use 352
W. Lewis Johnson, Naveen Ashish, Stephen Bodnar, and Alicia Sagae

Developing an Intelligent Tutoring System Using Natural Language for Knowledge Representation 355
Sung-Young Jung and Kurt VanLehn

A Network Analysis of Student Groups in Threaded Discussions 359
Jeon-Hyung Kang, Jihie Kim, and Erin Shaw

A New Framework of Metacognition with Abstraction/Instantiation Operations 362
Michiko Kayashima and Riichiro Mizoguchi

Expansion of the xPST Framework to Enable Non-programmers to Create Intelligent Tutoring Systems in 3D Game Environments 365
Sateesh Kumar Kodavali, Stephen Gilbert, and Stephen B. Blessing

A Computational Model of Accelerated Future Learning through Feature Recognition 368
Nan Li, William W. Cohen, and Kenneth R. Koedinger

Automated and Flexible Comparison of Course Sequencing Algorithms in the LS-Lab Framework 371
Carla Limongelli, Filippo Sciarrone, Marco Temperini, and Giulia Vaste

Correcting Scientific Knowledge in a General-Purpose Ontology 374
Michael Lipschultz and Diane Litman

Learning to Argue Using Computers – A View from Teachers, Researchers, and System Developers 377
Frank Loll, Oliver Scheuer, Bruce M. McLaren, and Niels Pinkwart

How to Take into Account Different Problem Solving Modalities for Doing a Diagnosis? Experiment and Results 380
Sandra Michelet, Vanda Luengo, Jean-Michel Adam, and Nadine Madran

Behavior Effect of Hint Selection Penalties and Availability in an Intelligent Tutoring System 384
Pedro J. Muñoz-Merino, Carlos Delgado Kloos, and Mario Muñoz-Organero

DesignWebs: A Tool for Automatic Construction of Interactive Conceptual Maps from Document Collections 387
Sharad V. Oberoi, Dong Nguyen, Gahgene Gweon, Susan Finger, and Carolyn Penstein Rosé

Extraction of Concept Maps from Textbooks for Domain Modeling 390
Andrew M. Olney

Levels of Interaction (LoI): A Model for Scaffolding Learner Engagement in an Immersive Environment 393
David Panzoli, Adam Qureshi, Ian Dunwell, Panagiotis Petridis, Sara de Freitas, and Genaro Rebolledo-Mendez

Tools for Acquiring Data about Student Work in Interactive Learning Environment T-Algebra 396
Rein Prank and Dmitri Lepp

Mily's World: A Coordinate Geometry Learning Environment with Game-Like Properties 399
Dovan Rai, Joseph E. Beck, and Neil T. Heffernan

An Intelligent Tutoring System Supporting Metacognition and Sharing Learners' Experiences 402
Triomphe Ramandalahy, Philippe Vidal, and Julien Broisin

Are ILEs Ready for the Classroom? Bringing Teachers into the Feedback Loop 405
James Segedy, Brian Sulcer, and Gautam Biswas

Comparison of a Computer-Based to Hands-On Lesson in Experimental Design 408
Stephanie Siler, Dana Mowery, Cressida Magaro, Kevin Willows, and David Klahr

Toward the Development of an Intelligent Tutoring System for Distributed Team Training through Passive Sensing 411
Robert A. Sottilare

Open Educational Resource Assessments (OPERA) 414
Tamara Sumner, Kirsten Butcher, and Philipp Wetzler

Annie: A Tutor That Works in Digital Games 417
James M. Thomas and R. Michael Young

Learning from Erroneous Examples 420
Dimitra Tsovaltzi, Bruce M. McLaren, Erica Melis, Ann-Kristin Meyer, Michael Dietrich, and George Goguadze

Feasibility of a Socially Intelligent Tutor 423
Jozef Tvarožek and Mária Bieliková

Agent Prompts: Scaffolding Students for Productive Reflection in an Intelligent Learning Environment 426
Longkai Wu and Chee-Kit Looi

Identifying Problem Localization in Peer-Review Feedback 429
Wenting Xiong and Diane Litman

AlgoTutor: From Algorithm Design to Coding 432
Sung Yoo and Jungsoon Yoo

Adaptive, Assessment-Based Educational Games 435
Diego Zapata-Rivera

Interactive Events

ITS Authoring through Programming-by-Demonstration 438
Vincent Aleven, Brett Leber, and Jonathan Sewall

A Coordinate Geometry Learning Environment with Game-Like Properties 439
Dovan Rai, Joseph E. Beck, and Neil T. Heffernan

Adaptive Tutorials and the Adaptive eLearning Platform 440
Dror Ben-Naim

DomainBuilder – An Authoring System for Visual Classification Tutoring Systems 441
Eugene Tseytlin, Melissa Castine, and Rebecca Crowley

AWESOME Computing: Using Corpus Data to Tailor a Community Environment for Dissertation Writing 443
Vania Dimitriva, Royce Neagle, Sirisha Bajanki, Lydia Lau, and Roger Boyle

Collaboration and Content Recognition Features in an Inquiry Tutor ... 444
Mark Floryan, Toby Dragon, Beverly Woolf, and Tom Murray

The Science Assistments Project: Scaffolding Scientific Inquiry Skills ... 445
Janice D. Gobert, Orlando Montalvo, Ermal Toto, Michael A. Sao Pedro, and Ryan S.J.d. Baker

Incorporating Interactive Examples into the Cognitive Tutor 446
Robert G.M. Hausmann, Steven Ritter, Brendon Towle, R. Charles Murray, and John Connelly

iGeom: Towards an Interactive Geometry Software with Intelligent Guidance Capabilities 447
Leônidas O. Brandão, Seiji Isotani, and Danilo L. Dalmon

Acquiring Conceptual Knowledge about How Systems Behave 448
Jochem Liem, Bert Bredeweg, Floris Linnebank, René Bühling, Michael Wißner, Jorge Gracia del Río, Wouter Beek, and Asunción Gómez Pérez

Learning by Teaching SimStudent 449
Noboru Matsuda, Victoria Keiser, Rohan Raizada, Gabriel Stylianides, William W. Cohen, and Ken Koedinger

Authoring Problem-Solving ITS with ASTUS 450
Jean-François Lebeau, Luc Paquette, and André Mayers

A Better Reading Tutor That Listens 451
Jack Mostow, Greg Aist, Juliet Bey, Wei Chen, Al Corbett, Weisi Duan, Nell Duke, Minh Duong, Donna Gates, José P. González, Octavio Juarez, Martin Kantorzyk, Yuanpeng Li, Liu Liu, Margaret McKeown, Christina Trotochaud, Joe Valeri, Anders Weinstein, and David Yen

Research-Based Improvements in Cognitive Tutor Geometry 452
Steven Ritter, Brendon Towle, R. Charles Murray, Robert G.M. Hausmann, and John Connelly

A Cognitive Tutor for Geometric Proof 453
Steven Ritter, Brendon Towle, R. Charles Murray, Robert G.M. Hausmann, and John Connelly

Multiplayer Language and Culture Training in ISLET 454
Kevin Saunders and W. Lewis Johnson

PSLC DataShop: A Data Analysis Service for the Learning Science Community 455
John Stamper, Ken Koedinger, Ryan S.J.d. Baker, Alida Skogsholm, Brett Leber, Jim Rankin, and Sandy Demi

A DIY Pressure Sensitive Chair for Intelligent Tutoring Systems 456
Andrew M. Olney and Sidney D'Mello

Author Index 457

Table of Contents – Part I

Invited Talks

Can Research-Based Technology Change School-Based Learning? Perspectives from Singapore 1
Chee-Kit Looi

Modeling Emotion and Its Expression 2
Stacy Marsella

Active Learning in Technology-Enhanced Environments: On Sensible and Less Sensible Conceptions of "Active" and Their Instructional Consequences 3
Alexander Renkl

Riding the Third Wave 4
Steven Ritter

Social and Caring Tutors: ITS 2010 Keynote Address 5
Beverly Park Woolf

Educational Data Mining 1

Predicting Correctness of Problem Solving in ITS with a Temporal Collaborative Filtering Approach 15
Suleyman Cetintas, Luo Si, Yan Ping Xin, and Casey Hord

Detecting the Moment of Learning 25
Ryan S.J.d. Baker, Adam B. Goldstein, and Neil T. Heffernan

Comparing Knowledge Tracing and Performance Factor Analysis by Using Multiple Model Fitting Procedures 35
Yue Gong, Joseph E. Beck, and Neil T. Heffernan

Natural Language Interaction 1

Automatic Question Generation for Literature Review Writing Support 45
Ming Liu, Rafael A. Calvo, and Vasile Rus

Characterizing the Effectiveness of Tutorial Dialogue with Hidden Markov Models 55
Kristy Elizabeth Boyer, Robert Phillips, Amy Ingram, Eun Young Ha, Michael Wallis, Mladen Vouk, and James Lester

Exploiting Predictable Response Training to Improve Automatic Recognition of Children's Spoken Responses 65
Wei Chen, Jack Mostow, and Gregory Aist

ITS in Ill-Defined Domains

Leveraging a Domain Ontology to Increase the Quality of Feedback in an Intelligent Tutoring System 75
Hameedullah Kazi, Peter Haddawy, and Siriwan Suebnukarn

Modeling Long Term Learning of Generic Skills 85
Richard Gluga, Judy Kay, and Tim Lever

Eliciting Informative Feedback in Peer Review: Importance of Problem-Specific Scaffolding 95
Ilya M. Goldin and Kevin D. Ashley

Inquiry Learning

Layered Development and Evaluation for Intelligent Support in Exploratory Environments: The Case of Microworlds 105
Sergio Gutierrez-Santos, Manolis Mavrikis, and George Magoulas

The Invention Lab: Using a Hybrid of Model Tracing and Constraint-Based Modeling to Offer Intelligent Support in Inquiry Environments 115
Ido Roll, Vincent Aleven, and Kenneth R. Koedinger

Discovering and Recognizing Student Interaction Patterns in Exploratory Learning Environments 125
Andrea Bernardini and Cristina Conati

Collaborative and Group Learning 1

Lesson Study Communities on Web to Support Teacher Collaboration for Professional Development 135
Yukari Kato and Masatoshi Ishikawa

Using Problem-Solving Context to Assess Help Quality in Computer-Mediated Peer Tutoring 145
Erin Walker, Sean Walker, Nikol Rummel, and Kenneth R. Koedinger

Socially Capable Conversational Tutors Can Be Effective in Collaborative Learning Situations 156
Rohit Kumar, Hua Ai, Jack L. Beuth, and Carolyn P. Rosé

Intelligent Games 1

Facial Expressions and Politeness Effect in Foreign Language Training System 165
Ning Wang, W. Lewis Johnson, and Jonathan Gratch

Intercultural Negotiation with Virtual Humans: The Effect of Social Goals on Gameplay and Learning 174
Amy Ogan, Vincent Aleven, Julia Kim, and Christopher Jones

Gaming the System

An Analysis of Gaming Behaviors in an Intelligent Tutoring System 184
Kasia Muldner, Winslow Burleson, Brett Van de Sande, and Kurt VanLehn

The Fine-Grained Impact of Gaming (?) on Learning 194
Yue Gong, Joseph E. Beck, Neil T. Heffernan, and Elijah Forbes-Summers

Squeezing Out Gaming Behavior in a Dialog-Based ITS 204
Peter Hastings, Elizabeth Arnott-Hill, and David Allbritton

Pedagogical Strategies 1

Analogies, Explanations, and Practice: Examining How Task Types Affect Second Language Grammar Learning 214
Ruth Wylie, Kenneth R. Koedinger, and Teruko Mitamura

Do Micro-Level Tutorial Decisions Matter: Applying Reinforcement Learning to Induce Pedagogical Tutorial Tactics 224
Min Chi, Kurt VanLehn, and Diane Litman

Examining the Role of Gestures in Expert Tutoring 235
Betsy Williams, Claire Williams, Nick Volgas, Brian Yuan, and Natalie Person

Affect 1

A Time for Emoting: When Affect-Sensitivity Is and Isn't Effective at Promoting Deep Learning 245
Sidney D'Mello, Blair Lehman, Jeremiah Sullins, Rosaire Daigle, Rebekah Combs, Kimberly Vogt, Lydia Perkins, and Art Graesser

The Affective and Learning Profiles of Students Using an Intelligent Tutoring System for Algebra 255
Maria Carminda V. Lagud and Ma. Mercedes T. Rodrigo

The Impact of System Feedback on Learners' Affective and Physiological States 264
Payam Aghaei Pour, M. Sazzad Hussain, Omar AlZoubi, Sidney D'Mello, and Rafael A. Calvo

Games and Augmented Reality

Investigating the Relationship between Presence and Learning in a Serious Game 274
H. Chad Lane, Matthew J. Hays, Daniel Auerbach, and Mark G. Core

Developing Empirically Based Student Personality Profiles for Affective Feedback Models 285
Jennifer Robison, Scott McQuiggan, and James Lester

Evaluating the Usability of an Augmented Reality Based Educational Application 296
Jorge Martín-Gutiérrez, Manuel Contero, and Mariano Alcañiz

Pedagogical Agents, Learning Companions, and Teachable Agents

What Do Children Favor as Embodied Pedagogical Agents? 307
Sylvie Girard and Hilary Johnson

Learning by Teaching SimStudent: Technical Accomplishments and an Initial Use with Students 317
Noboru Matsuda, Victoria Keiser, Rohan Raizada, Arthur Tu, Gabriel Stylianides, William W. Cohen, and Kenneth R. Koedinger

The Effect of Motivational Learning Companions on Low Achieving Students and Students with Disabilities 327
Beverly Park Woolf, Ivon Arroyo, Kasia Muldner, Winslow Burleson, David G. Cooper, Robert Dolan, and Robert M. Christopherson

Intelligent Tutoring and Scaffolding 1

Use of a Medical ITS Improves Reporting Performance among Community Pathologists 338
Rebecca Crowley, Dana Grzybicki, Elizabeth Legowski, Lynn Wagner, Melissa Castine, Olga Medvedeva, Eugene Tseytlin, Drazen Jukic, and Stephen Raab

Hints: Is It Better to Give or Wait to Be Asked? 349
Leena Razzaq and Neil T. Heffernan

Error-Flagging Support for Testing and Its Effect on Adaptation 359
Amruth N. Kumar

Metacognition

Emotions and Motivation on Performance during Multimedia Learning: How Do I Feel and Why Do I Care? 369
Amber Chauncey and Roger Azevedo

Metacognition and Learning in Spoken Dialogue Computer Tutoring ... 379
Kate Forbes-Riley and Diane Litman

A Self-regulator for Navigational Learning in Hyperspace 389
Akihiro Kashihara and Ryoya Kawai

Pedagogical Strategies 2

How Adaptive Is an Expert Human Tutor? 401
Michelene T.H. Chi and Marguerite Roy

Blocked versus Interleaved Practice with Multiple Representations in an Intelligent Tutoring System for Fractions 413
Martina A. Rau, Vincent Aleven, and Nikol Rummel

Improving Math Learning through Intelligent Tutoring and Basic Skills Training 423
Ivon Arroyo, Beverly Park Woolf, James M. Royer, Minghui Tai, and Sara English

Author Index 433