

Table of Contents

Invited Talks (abstracts)

Behind the Scenes of Duolingo	3
<i>Luis Von Ahn, Matt Streeter</i>	
Personal Knowledge/Learning Graph	5
<i>George Siemens, Ryan Baker, Dragan Gasevic</i>	
Educational Neuroscience as a Tool to Understand Learning and Learning Disabilities in Mathematics	7
<i>Pekka Räsänen</i>	

Panels (abstracts)

The Future of Practical Applications of EDM at Scale (Industry track)	11
<i>Ryan Baker, John Carney, Piotr Mitros, Bror Saxberg (moderator), John Stamper</i>	
Ethics and Privacy in EDM	13
<i>Dragan Gasevic, Taylor Martin (moderator), Zach Pardos, Mykola Pechenizkiy, John Stamper, Osmar Zaiane</i>	
Grand Challenges for EDM and Related Research Areas	15
<i>Ryan Baker (moderator), Peter Brusilovsky, Dragan Gasevic, Neil T. Heffernan, Mykola Pechenizkiy, Alyssa Wise</i>	

JEDM Track journal papers (abstracts)

Metrics for Evaluation of Student Models	19
<i>Radek Pelánek</i>	
Multi-Armed Bandits for Intelligent Tutoring Systems	21
<i>Benjamin Clement, Didier Roy, Pierre-Yves Oudeyer, Manuel Lopes</i>	
Developing Computational Methods to Measure and Track Learners' Spatial Reasoning in an Open-Ended Simulation	23
<i>Aditi Mallavarapu, Leilah Lyons, Tia Shelley, Brian Slattery, Moira Zellner, Emily Minor</i>	
Move your lamp post: Recent data reflects learner knowledge better than older data	25
<i>April Galyardt, Ilya Goldin</i>	

Full Papers

Combining techniques to refine item to skills Q-matrices with a partition tree	29
<i>Michel Desmarais, Peng Xu and Behzad Beheshti</i>	
On the Performance Characteristics of Latent-Factor and Knowledge Tracing Models	37
<i>Severin Klingler, Tanja Käser, Barbara Solenthaler and Markus Gross</i>	
Mixture Modeling of Individual Learning Curves	45
<i>Matthew Streeter</i>	
Accounting for Slipping and Other False Negatives in Logistic Models of Student Learning	53
<i>Christopher Maclellan, Ran Liu and Kenneth Koedinger</i>	
Learning Environments and Inquiry Behaviors in Science Inquiry Learning: How Their Interplay Affects the Development of Conceptual Understanding in Physics	61
<i>Engin Bumbacher, Shima Salehi, Miriam Wierzychula and Paulo Blikstein</i>	

Toward a Real-time (Day) Dreamcatcher: Detecting Mind Wandering Episodes During Online Reading <i>Caitlin Mills and Sidney D'Mello</i>	69
A Comparison of Face-based and Interaction-based Affect Detectors in Physics Playground <i>Shiming Kai, Luc Paquette, Ryan S. Baker, Nigel Bosch, Sidney D'mello, Jaclyn Ocumpaugh, Valerie Shute and Matthew Ventura</i>	77
Exploring Dynamical Assessments of Affect, Behavior, and Cognition and Math State Test Achievement <i>Maria Ofelia San Pedro, Erica Snow, Ryan Baker, Danielle McNamara and Neil Heffernan</i>	85
Sensor-Free or Sensor-Full: A Comparison of Data Modalities in Multi-Channel Affect Detection <i>Luc Paquette, Jonathan Rowe, Ryan Baker, Bradford Mott, James Lester, Jeanine Defalco, Keith Brawner, Robert Sottolare and Vasiliki Georgoulas</i>	93
Machine Beats Experts: Automatic Discovery of Skill Models for Data-Driven Online Courseware Refinement <i>Noboru Matsuda, Tadanobu Furukawa, Norman Bier and Christos Faloutsos</i>	101
Student Models for Prior Knowledge Estimation <i>Juraj Nižnan, Radek Pelánek and Jirí Rihák</i>	109
Discovering Prerequisite Structure of Skills through Probabilistic Association Rules Mining <i>Yang Chen, Wuillem Pierre-Henri and Jean-Marc Labat</i>	117
Choosing to Interact: Exploring the Relationship Between Learner Personality, Attitudes, and Tutorial Dialogue Participation <i>Aysu Ezen-Can and Kristy Elizabeth Boyer</i>	125
Considering the Influence of Prerequisite Performance on Wheel Spinning <i>Hao Wan and Joseph Beck</i>	129
Comparing Novice and Experienced Students in Virtual Performance Assessments <i>Yang Jiang, Luc Paquette, Ryan Baker and Jody Clarke-Midura</i>	136
The Impact of Incorporating Student Confidence Items into an Intelligent Tutor: A Randomized Controlled Trial <i>Charles Lang, Neil Heffernan, Korinn Ostrow and Yutao Wang</i>	144
Analyzing Early At-Risk Factors in Higher Education e-Learning Courses (Industry track) <i>Ryan Baker, David Lindrum, Mary Jane Lindrum and David Perkowski</i>	150
Do Country Stereotypes Exist in Educational Data? A Clustering Approach for Large, Sparse, and Weighted Data <i>Mirka Saarela and Tommi Kärkkäinen</i>	156
Student Privacy and Educational Data Mining: Perspectives from Industry (Industry track) <i>Jennifer Sabourin, Lucy Kosturko, Clare Fitzgerald and Scott Mcquiggan</i>	164
Beyond Prediction: Towards Automatic Intervention in MOOC Student Stop-out <i>Jacob Whitehill, Joseph Williams, Glenn Lopez, Cody Coleman and Justin Reich</i>	171
From Predictive Models to Instructional Policies <i>Joseph Rollinson and Emma Brunskill</i>	179
Your Model Is Predictive— but Is It Useful? Theoretical and Empirical Considerations of a New Paradigm for Adaptive Tutoring Evaluation <i>José González-Brenes and Yun Huang</i>	187
Automated Session-Quality Assessment for Human Tutoring Based on Expert Ratings of Tutoring Success <i>Benjamin Nye, Donald Morrison and Borhan Samei</i>	195
A Framework for Multifaceted Evaluation of Student Models <i>Yun Huang, José González-Brenes, Rohit Kumar and Peter Brusilovsky</i>	203

Predicting Student Performance In a Collaborative Learning Environment	211
<i>Jennifer Olsen, Vincent Alevan and Nikol Rummel</i>	
Learning Instructor Intervention from MOOC Forums: Early Results and Issues	218
<i>Muthu Kumar Chandrasekaran, Min-Yen Kan, Bernard C.Y.Tan and Kiruthika Ragupathi</i>	
Investigating How Student's Cognitive Behavior in MOOC Discussion Forum Affect Learning Gains	226
<i>Xu Wang, Diyi Yang, Miaomiao Wen, Kenneth Koedinger and Carolyn Rose</i>	
Methodological Challenges in the Analysis of MOOC Data for Exploring the Relationship between Discussion Forum Views and Learning Outcomes	234
<i>Yoav Bergner, Deirdre Kerr and David Pritchard</i>	
Influence Analysis by Heterogeneous Network in MOOC Forums: What can We Discover?	242
<i>Zhuoxuan Jiang, Yan Zhang, Chi Liu and Xiaoming Li</i>	
Modeling Learners' Social Centrality and Performance through Language and Discourse	250
<i>Nia Dowell, Oleksandra Skrypnik, Srecko Joksimovic, Arthur Graesser, Shane Dawson, Dragan Gašević, Pieter de Vries, Thieme Hennis and Vitomir Kovanovic</i>	
You are your words: Modeling Students' Vocabulary Knowledge with Natural Language Processing Techniques	258
<i>Laura Allen and Danielle McNamara</i>	
Automatic Identification of Nutritious Contexts for Learning Vocabulary Words	266
<i>Jack Mostow, Donna Gates, Ross Ellison and Rahul Goutam</i>	
Mining a Written Values Affirmation Intervention to Identify the Unique Linguistic Features of Stigmatized Groups	274
<i>Travis Riddle, Sowmya Bhagavatula, Weiwei Guo, Smaranda Muresan, Geoff Cohen, Jonathan Cook and Valerie Purdie-Vaughns</i>	
Automatic Classification of Question & Answer Discourse Segments from Teacher's Speech in Classrooms	282
<i>Nathaniel Blanchard, Sidney D'Mello, Andrew Olney and Martin Nystrand</i>	
Topic Transition in Educational Videos Using Visually Salient Words	289
<i>Ankit Gandhi, Arijit Biswas and Om Deshmukh</i>	
YouEDU: Addressing Confusion in MOOC Discussion Forums by Recommending Instructional Video Clips	297
<i>Akshay Agrawal, Jagadish Venkatraman, Shane Leonard and Andreas Paepcke</i>	
Seeing the Instructor in Two Video Styles: Preferences and Patterns	305
<i>Suma Bhat, Phakpoom Chinprutthiwong and Michelle Perry</i>	
Using Partial Credit and Response History to Model User Knowledge	313
<i>Eric Van Inwegen, Seth Adjei, Yan Wang and Neil Heffernan</i>	
Translating Head Motion into Attention - Towards Processing of Student's Body-Language	320
<i>Mirko Raca, Lukasz Kidzinski and Pierre Dillenbourg</i>	
Using Visual Analytics Tool for Improving Data Comprehension	327
<i>Jan Geryk</i>	
Data-Driven Problem Profiling	335
<i>Behrooz Mostafavi, Zhongxiu Liu and Tiffany Barnes</i>	
Interaction Network Estimation: Predicting Problem-Solving Diversity in Interactive Environments	342
<i>Michael Eagle, Andrew Hicks and Tiffany Barnes</i>	
Why Do the Rich Get Richer? A Structural Equation Model to Test How Spatial Skills Affect Learning with Representations	350
<i>Martina Rau</i>	

Short Papers

Spectral Bayesian Knowledge Tracing	360
<i>Mohammad Hassan Falakmasir, Michael Yudelson, Steve Ritter and Kenneth Koedinger</i>	
Direct Estimation of the Minimum RSS Value for Training Bayesian Knowledge Tracing Parameters	364
<i>Francesc Martori Adrian, Jordi Cuadros and Lucinio González-Sabaté</i>	
Goodness of Fit of Skills Assessment Approaches: Insights from Patterns of Real vs. Synthetic Data Sets	368
<i>Behzad Beheshti and Michel Desmarais</i>	
A Transfer Learning Approach for Applying Matrix Factorization to Small ITS Datasets	372
<i>Lydia Voß, Carlotta Schatten, Claudia Mazziotti and Lars Schmidt-Thieme</i>	
Towards Understanding How to Leverage Sense-making, Induction/Refinement and Fluency to Improve Robust Learning	376
<i>Shayan Doroudi, Kenneth Holstein, Vincent Alevan and Emma Brunskill</i>	
Learning Behavior Characterization with Multi-Feature, Hierarchical Activity Sequences	380
<i>Cheng Ye, John S. Kinnebrew, James R. Segedy and Gautam Biswas</i>	
Discrimination-Aware Classifiers for Student Performance Prediction	384
<i>Ling Luo, Irena Koprinska and Wei Liu</i>	
Language to Completion: Success in an Educational Data Mining Massive Open Online Class	388
<i>Scott Crossley, Danielle McNamara, Ryan Baker, Yuan Wang, Luc Paquette, Tiffany Barnes and Yoav Bergner</i>	
A Comparative Study of Regression and Classification Algorithms for Modelling Students' Academic Performance	392
<i>Pedro Strecht, Luis Cruz, Carlos Soares, João Mendes-Moreira and Rui Abreu</i>	
Predicting Student Grade based on Free-style Comments using Word2Vec and ANN by Considering Prediction Results Obtained in Consecutive Lessons	396
<i>Jingyi Luo, Shaymaa E.Sorour, Tsunenori Mine and Goda Kazumasa</i>	
Learning the Creative Potential of Students by Mining a Word Association Task	400
<i>Cristian Olivares-Rodríguez and Mariluz Guenaga</i>	
Optimizing Partial Credit Algorithms to Predict Student Performance	404
<i>Korinn Ostrow, Christopher Donnelly and Neil Heffernan</i>	
Identifying Styles and Paths toward Success in MOOCs	408
<i>Kshitij Sharma, Patrick Jermann and Pierre Dillenbourg</i>	
Analyzing Student Inquiry Data Using Process Discovery and Sequence Classification	412
<i>Bruno Emond and Scott Buffett</i>	
Desirable Difficulty and Other Predictors of Effective Item Orderings	416
<i>Steven Tang, Hannah Gogel, Elizabeth McBride and Zachary Pardos</i>	
Variations in Learning Rate: Student Clustering Based on Systematic Residual Error Patterns Across Practice Opportunities	420
<i>Ran Liu and Kenneth R Koedinger</i>	
Evaluating Educational Videos using Bayesian Knowledge Tracing and Big Data	424
<i>Zachary Machardy and Zachary Pardos</i>	
Measuring Problem Solving Skills in Plants vs. Zombies 2	428
<i>Valerie Shute, Gregory Moore and Lubin Wang</i>	
Strategic Game Moves Mediate Implicit Science Learning	432
<i>Elizabeth Rowe, Ryan Baker and Jodi Asbell-Clarke</i>	

Predicting learning-related emotions from students' textual classroom feedback via Twitter <i>Nabeela Altrabsheh, Mihaela Cocea and Sanaz Fallahkhair</i>	436
Video-Based Affect Detection in Noninteractive Learning Environments <i>Yuxuan Chen, Nigel Bosch and Sidney D'Mello</i>	440
Modeling Classroom Discourse: Do Models of Predicting Dialogic Instruction Properties Generalize across Populations? <i>Borhan Samei, Andrew Olney, Sean Kelly, Martin Nystrand, Sidney D'Mello, Nathan Blanchard and Arthur C. Graesser</i>	444
Breaking Off Engagement: Readers' Cognitive Decoupling as a Function of Reader and Text Characteristics <i>Patricia Goedecke, Daqi Dong, Genghu Shi, Shi Feng, Evan Risko, Andrew Olney, Sidney D'Mello and Arthur C. Graesser</i>	448
Semantic Similarity Graphs of Mathematics Word Problems: Can Terminology Detection Help? <i>Rogers Jeffrey Leo John, Rebecca J. Passonneau and Thomas S. McTavish</i>	452
An Analysis of Peer-submitted and Peer-reviewed Answer Rationales in a Web-based Peer Instruction Based Learning Environment <i>Sameer Bhatnagar, Michel Desmarais, Chris Whittaker, Nathaniel Lasry, Michael Dugdale, Kevin Lenton and Elizabeth Charles</i>	456
Learning Analytics Platform. Towards an Open Scalable Streaming Solution for Education <i>Nicholas Lewkow, Neil Zimmerman, Mark Riedesel and Alfred Essa</i>	460
Improving Student Performance Using Nudge Analytics (Industry track) <i>Jacqueline Feild</i>	464
Educational Reports That Scale Across Users and Data (Industry track) <i>Rob Rolleston, Richard Howe and Mary Ann Sprague</i>	468
Mining Login Data For Actionable Student Insight (Industry track) <i>Lalitha Agnihotri, Ani Aghababayan, Shirin Mojarad, Mark Riedesel and Al Essa</i>	472
Building Models to Predict Hint-or-Attempt Actions of Students <i>Francisco Enrique Vicente Castro, Seth Adjei, Tyler Colombo and Neil Heffernan</i>	476
Modeling Students' Memory for Application in Adaptive Educational Systems <i>Radek Pelánek</i>	480
Social Facilitation Effects by Pedagogical Conversational Agent: Lexical Network Analysis in an Online Explanation Task <i>Yugo Hayashi</i>	484
Personalized Education; Solving a Group Formation and Scheduling Problem for Educational Content <i>Sanaz Bahargam, Dora Erdos, Azer Bestavros and Evimaria Terzi</i>	488
An Approach of Collaboration Analytics in MOOCs Using Social Network Analysis and Influence Diagram <i>Antonio R. Anaya, Jesús G. Boticario, Emilio Letón and Félix Hernández-Del-Olmo</i>	492
On Convergence of Cognitive and Non-cognitive Behavior in Collaborative Activity <i>Diego Luna Bazaldua, Saad Khan, Alina von Davier, Jiangang Hao, Lei Liu and Zuowei Wang</i>	496
The Impact of Small Learning Group Composition on Drop-Out Rate and Learning Performance in a MOOC <i>Zhilin Zheng, Tim Vogelsang and Niels Pinkwart</i>	500
Exploring Causal Mechanisms in a Randomized Effectiveness Trial of the Cognitive Tutor Algebra I Program <i>Adam Sales and John Pane</i>	504

Confounding Carelessness? Exploring Causal Relationships Between Carelessness, Affect, Behavior, and Learning in Cognitive Tutor Algebra Using Graphical Causal Models	508
<i>Stephen Fancsali</i>	
Students at Risk: Detection and Remediation	512
<i>Irena Koprinska, Joshua Stretton and Kalina Yacef</i>	
Intelligent Tutor Recommender System for On-Line Educational Environments	516
<i>Cristian Mihaescu, Paul Stefan Popescu and Costel Ionascu</i>	
Discovering the Pedagogical Resources that Assist Students to Answer Questions Correctly – A Machine Learning Approach	520
<i>Giora Alexandron, Qian Zhou and David Pritchard</i>	
Using Topic Segmentation Models for the Automatic Organisation of MOOCs resources	524
<i>Ghada Alharbi and Thomas Hain</i>	
How High School, College, and Online Students Differentially Engage with an Interactive Digital Textbook	528
<i>Jeremy Warner, John Doorenbos, Bradley Miller and Philip Guo</i>	
Modeling Exercise Relationships in E-Learning: A Unified Approach	532
<i>Haw-Shiuan Chang, Hwai-Jung Hsu and Kuan-Ta Chen</i>	
Using Knowledge Components for Collaborative Filtering in Adaptive Tutoring Systems	536
<i>Peter Halkier Nicolajsen and Barbara Plank</i>	
Exploring the Influence of ICT in online Education Through Data Mining Tools	540
<i>Javier Bravo, Sonia Janeth Romero, María Luna and Sonia Pamplona</i>	
Understanding Revision Planning in Peer-Reviewed Writing	544
<i>Alok Baikadi, Christian Schunn and Kevin Ashley</i>	
Convergent Validity of a Student Model: Recent-Performance Factors Analysis	548
<i>Ilya Goldin and April Galyardt</i>	
Posters and Demos	
Automatic Grading of Short Answers for MOOC via Semi-supervised Document Clustering	554
<i>Shumin Jing</i>	
Discovering Students' Navigation Paths in Moodle	556
<i>Alejandro Bogarin, Cristobal Romero and Rebeca Cerezo</i>	
Teacher-Student Classroom Interactions: A Computational Approach	558
<i>Arnon HersHKovitz, Agathe Merceron and Amran Shamaly</i>	
Modeling Student Learning: Binary or Continuous Skill?	560
<i>Radek Pelánek</i>	
An Analysis of Response Times in Adaptive Practice of Geography Facts	562
<i>Jan Papoušek, Radek Pelánek, Jiří Řihák and Vít Stanislav</i>	
Achievement versus Experience: Predicting Students' Choices during Gameplay	564
<i>Erica Snow, Maria Ofelia San Pedro, Matthew Jacovina, Danielle McNamara and Ryan Baker</i>	
How to Aggregate Multimodal Features for Perceived Task Difficulty Recognition in Intelligent Tutoring Systems	566
<i>Ruth Janning, Carlotta Schatten and Lars Schmidt-Thieme</i>	
Teacher and Learner Behaviour in an Online EFL Workbook	568
<i>Krzysztof Jędrzejewski, Mikołaj Bogucki, Mikołaj Olszewski, Jan Zwoliński and Kacper Łodzickowski</i>	
Skill Assessment Using Behavior Data in Virtual World	570
<i>Ailiya Borjigin, Chunyan Miao, Zhiqi Shen and Zhiwei Zeng</i>	

Pacing through MOOCs: Course Design or Teaching Effect? <i>Lorenzo Vigentini and Andrew Claypahn</i>	572
Integrating a Web-based ITS with DM tools for Providing Learning Path Optimization and Visual Analytics <i>Igor Jugo, Božidar Kovačić and Vanja Slavuj</i>	574
Different Patterns of Students' Interaction with Moodle and Their Relationship with Achievement <i>Rebeca Cerezo, Miguel Sanchez-Santillan, Jose C Nuñez and M. Puerto Paule</i>	576
Educational Data Mining in an Open-Ended Remote Laboratory on Electric Circuits. Goals and Preliminary Results <i>Jordi Cuadros, Lucinio Gonzalez, Susana Romero, M. Luz Guenaga, Javier Garcia-Zubia and Pablo Orduña</i>	578
Discovering Process in Curriculum Data to Provide Recommendation <i>Ren Wang and Osmar Zaiane</i>	580
Improving Long-Term Retention Level in an Environment of Personalized Expanding Intervals <i>Xiaolu Xiong and Joseph Beck</i>	582
Exploring Problem-Solving Behavior in an Optics Game <i>Michael Eagle, Rebecca Brown, Elizabeth Rowe, Tiffany Barnes, Jodi Asbell-Clarke and Teon Edwards</i>	584
Simulating Multi-Subject Momentary Time Sampling <i>Luc Paquette, Jaclyn Ocumpaugh and Ryan Baker</i>	586
Analyzing Students' Interaction Based on Their Response to Determine Their Learning Outcomes <i>Fazel Keshtkar, Jordan Cowart, Ben Kingen and Andrew Crutcher</i>	588
Exploring the Impact of Spacing in Mathematics Learning through Data Mining <i>Richard Tibbles</i>	590
Data-Driven Analyses of Electronic Text Books <i>Ahcène Boubekki, Ulf Kröhne, Frank Goldhammer, Waltraud Schreiber and Ulf Brefeld. Toward</i>	592
How to Visualize Success: Presenting Complex Data in a Writing Strategy Tutor <i>Matthew Jacovina, Erica Snow, Laura Allen, Rod Roscoe, Jennifer Weston, Jianmin Dai and Danielle McNamara</i>	594
Adjusting the weights of assessment elements in the evaluation of Final Year Projects <i>Mikel Villamañe, Mikel Larrañaga, Ainhoa Alvarez and Begoña Ferrero</i>	596
Predicting Students' Outcome by Interaction Monitoring <i>Samara Ruiz, Maite Urretavizcaya and Isabel Fernandez-Castro</i>	598
Hierarchical Dialogue Act Classification in Online Tutoring Sessions <i>Borhan Samei, Vasile Rus, Benjamin Nye and Donald M. Morrison</i>	600
Towards Freshmen Performance Prediction <i>Hana Bydžovská</i>	602
Generalising IRT to Discriminate Between Examinees <i>Ahcène Boubekki, Ulf Brefeld and Thomas Delacroix</i>	604
Detection of Learners with a Performance Inconsistent with Their Effort <i>Diego García-Saiz and Marta Zorrilla</i>	606
A Probabilistic Model for Knowledge Component Naming <i>Cyril Goutte, Serge Léger and Guillaume Durand</i>	608
An Improved Data-Driven Hint Selection Algorithm for Probability Tutors <i>Thomas Price, Collin Lynch, Tiffany Barnes and Min Chi</i>	610
Good Communities and Bad Communities: Does Membership Affect Performance? <i>Rebecca Brown, Collin Lynch, Michael Eagle, Jennifer Albert, Tiffany Barnes, Ryan Baker, Yoav Bergner and Danielle McNamara</i>	612
A Model for Student Action Prediction in 3D Virtual Environments for Procedural Training <i>Diego Riofrío and Jaime Ramírez</i>	614
The Impact of Instructional Intervention and Practice on Help-Seeking Strategies within an ITS <i>Caitlin Tenison and Christopher Maclellan</i>	616

Predicting Performance on Dichotomous Questions: Comparing Models for Large-Scale Adaptive Testing	618
<i>Jill-Jénn Vie, Fabrice Popineau, Jean-Bastien Grill, Éric Bruillard and Yolaine Bourda</i>	
The Effect of the Distribution of Predictions of User Models	620
<i>Eric Van Inwegen, Yan Wang, Seth Adjei and Neil Heffernan</i>	
Predicting Student Aptitude Using Performance History	622
<i>Anthony F. Botelho, Seth A. Adjei, Hao Wan and Neil T. Heffernan</i>	
Discovering Concept Maps from Textual Sources	624
<i>Jagadeesh Chandra Bose RP, Om Deshmukh and Ravindra Bhavanam</i>	
Integrating Process and Product Data: The Case of an Automated Writing Evaluation System	626
<i>Chaitanya Ramineni, Tiago Caliço and Chen Li</i>	
Application of Sentiment and Topic Analysis to Teacher Evaluation Policy in the U.S.	628
<i>Antonio Moretti, Kathy McKnight and Ansaf Salieb-Aouissi</i>	
Defining Mastery: Knowledge Tracing Versus N- Consecutive Correct Responses	630
<i>Kim Kelly, Yan Wang, Tamisha Thompson and Neil Heffernan</i>	
A Toolbox for Adaptive Sequence Dissimilarity Measures for Intelligent Tutoring Systems (demo)	632
<i>Benjamin Paaßen, Bassam Mokbel and Barbara Hammer</i>	
Carnegie Learning’s Cognitive Tutor (demo)	633
<i>Steven Ritter and Stephen Fancsali</i>	
SAP: Student Attrition Predictor (demo)	635
<i>Devendra Singh Chaplot, Eunhee Rhim and Jihie Kim</i>	
Doctoral Consortium	
Dynamic User Modeling within a Game-Based ITS	639
<i>Erica Snow</i>	
Use of Time Information in Models behind Adaptive Practice System for Building Fluency in Mathematics	642
<i>Jiří Řihák</i>	
Integrating Learning Styles into Adaptive e-Learning System	645
<i>Huong May Truong</i>	
Modeling Speed-Accuracy Tradeoff in Adaptive System for Practicing Estimation	648
<i>Juraj Nižnan</i>	
Reimagining Khan Analytics for Student Coaches	651
<i>Jim Cunningham</i>	
Data Analysis Tools and Methods for Improving the Interaction Design in e-Learning	653
<i>Paul Stefan Popescu</i>	
Assessing the Roles of Student Engagement and Academic Emotions within Middle School Computer-Based Learning in College-Going Pathways	656
<i>Maria Ofelia San Pedro</i>	
Who Do You Think I Am? Modeling Individual Differences for More Adaptive and Effective Instruction	659
<i>Laura Allen</i>	
Developing Self-Regulated Learners Through an Intelligent Tutoring System	662
<i>Kim Kelly</i>	
Data-driven Hint Generation from Peer Debugging Solutions	665
<i>Zhongxiu Liu</i>	
Enhancing Student Motivation and Learning Within Adaptive Tutors	668
<i>Korinn Ostrow</i>	
Estimating the Local Size and Coverage of Interaction Network Regions	671
<i>Michael Eagle</i>	