# Table of Contents

## Human-Computer Interaction and Knowledge Discovery

Hypothesis Generation by Interactive Visual Exploration of Heterogeneous Medical Data .......................................................... 1  
* Cagatay Turkay, Arvid Lundervold, Astri Johansen Lundervold, and Helwig Hauser

Combining HCI, Natural Language Processing, and Knowledge Discovery - Potential of IBM Content Analytics as an Assistive Technology in the Biomedical Field ........................................ 13  
* Andreas Holzinger, Christof Stocker, Bernhard Ofner, Gottfried Prohaska, Alberto Brabenetz, and Rainer Hofmann-Wellenhof

Designing Computer-Based Clinical Guidelines Decision Support by a Clinician ............................................................... 25  
* Ljiljana Trtica-Majnarić and Aleksandar Včev

Opinion Mining on the Web 2.0 - Characteristics of User Generated Content and Their Impacts ........................................ 35  
* Gerald Petz, Michal Karpowicz, Harald Fürschuß, Andreas Auinger, Václav Strříteský, and Andreas Holzinger

Evaluation of SHAPD2 Algorithm Efficiency Supported by a Semantic Compression Mechanism in Plagiarism Detection Tasks ................................................................. 47  
* Dariusz Adam Ceglarek

Using Hasse Diagrams for Competence-Oriented Learning Analytics .......................................................... 59  
* Michael D. Kickmeier-Rust and Dietrich Albert

Towards the Detection of Deception in Interactive Multimedia Environments ................................................................. 65  
* Hugo Plácido da Silva, Ana Priscila Alves, André Lourenço, Ana Fred, Inês Montalvão, and Leonel Alegre

Predictive Sentiment Analysis of Tweets: A Stock Market Application .......................................................... 77  
* Jasmina Smailović, Miha Grčar, NadaLaurač, and Martin Žnidaršič

A UI Prototype for Emotion-Based Event Detection in the Live Web .......................................................... 89  
* George Valkanas and Dimitrios Gunopulos
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges from Cross-Disciplinary Learning Relevant for KDD Methods in Intercultural HCI Design</td>
<td>101</td>
</tr>
<tr>
<td>Rüdiger Heimgärtner</td>
<td></td>
</tr>
<tr>
<td>Intent Recognition Using Neural Networks and Kalman Filters</td>
<td>112</td>
</tr>
<tr>
<td>Pradipta Biswas, Gökçen Aslan Aydemir, Pat Langdon, and Simon Godsill</td>
<td></td>
</tr>
<tr>
<td>HCI Empowered Literature Mining for Cross-Domain Knowledge Discovery</td>
<td>124</td>
</tr>
<tr>
<td>Matjaž Juršič, Bojan Cestnik, Tanja Urbančič, and Nada Lavrač</td>
<td></td>
</tr>
<tr>
<td>An Interactive Course Analyzer for Improving Learning Styles Support Level</td>
<td>136</td>
</tr>
<tr>
<td>Moushir M. El-Bishouty, Kevin Saito, Ting-Wen Chang, Kinsuhk, and Sabine Graf</td>
<td></td>
</tr>
<tr>
<td>A Framework for Automatic Identification and Visualization of Mobile Device Functionalities and Usage</td>
<td>148</td>
</tr>
<tr>
<td>Renan H.P. Lima, Moushir M. El-Bishouty, and Sabine Graf</td>
<td></td>
</tr>
<tr>
<td>Crowdsourcing Fact Extraction from Scientific Literature</td>
<td>160</td>
</tr>
<tr>
<td>Christin Seifert, Michael Granitzer, Patrick Höfler, Belgin Mutlu, Vedran Sabol, Kai Schlegel, Sebastian Bayerl, Florian Stegmaier, Stefan Zwicklbauer, and Roman Kern</td>
<td></td>
</tr>
<tr>
<td>Digital Archives: Semantic Search and Retrieval</td>
<td>173</td>
</tr>
<tr>
<td>Dimitris Spiliotopoulos, Efstratios Tzoannos, Cosmin Cabulea, and Dominik Frey</td>
<td></td>
</tr>
<tr>
<td>Inconsistency Knowledge Discovery for Longitudinal Data Management: A Model-Based Approach</td>
<td>183</td>
</tr>
<tr>
<td>Roberto Boselli, Mirko Cesarini, Fabio Mercorio, and Mario Mezzanzanica</td>
<td></td>
</tr>
<tr>
<td>On Knowledge Discovery in Open Medical Data on the Example of the FDA Drug Adverse Event Reporting System for Alendronate (Fosamax)</td>
<td>195</td>
</tr>
<tr>
<td>Pinar Yıldırım, İlyas Özgür Ekmekçi, and Andreas Holzinger</td>
<td></td>
</tr>
<tr>
<td>Random Forests for Feature Selection in Non-invasive Brain-Computer Interfacing</td>
<td>207</td>
</tr>
<tr>
<td>David Steyrl, Reinhold Scherer, and Gernot R. Müller-Putz</td>
<td></td>
</tr>
<tr>
<td>Knowledge Discovery and Smart Homes</td>
<td>217</td>
</tr>
<tr>
<td>End Users Programming Smart Homes – A Case Study on Scenario Programming</td>
<td></td>
</tr>
<tr>
<td>Gerhard Leitner, Anton J. Fercher, and Christian Lassen</td>
<td></td>
</tr>
</tbody>
</table>
# Table of Contents

Understanding the Limitations of Eco-feedback: A One-Year Long-Term Study

*Lucas Pereira, Filipe Quintal, Mary Barreto, and Nuno J. Nunes*

“...Language in Their Very Gesture”: First Steps towards Calm Smart Home Input

*John N.A. Brown, Bonifaz Kaufmann, Franz Josef Huber, Karl-Heinz Pirolt, and Martin Hitz*

“Oh, I Say, Jeeves!” A Calm Approach to Smart Home Input

*John N.A. Brown, Bonifaz Kaufmann, Florian Bacher, Christophe Sourisse, and Martin Hitz*

## Smart Learning Environments

Optimizing Classroom Environment to Support Technology Enhanced Learning

*Junfeng Yang, Ronghui Huang, and Yanyan Li*

A Smart Problem Solving Environment

*Nguyen-Thinh Le and Niels Pinkwart*

Collaboration Is Smart: Smart Learning Communities

*Gabriele Frankl and Sofie Bitter*

Smart Open-Ended Learning Environments That Support Learners Cognitive and Metacognitive Processes

*Gautam Biswas, James R. Segedy, and John S. Kinnebrew*

Curriculum Optimization by Correlation Analysis and Its Validation

*Kohei Takada, Yuta Miyazawa, Yukiko Yamamoto, Yosuke Imada, Setsuo Tsuruta, and Rainer Knauf*

The Concept of eTextbooks in K-12 Classes from the Perspective of Its Stakeholders

*Guang Chen, Chaohua Gong, Junfeng Yang, Xiaoxuan Yang, and Ronghui Huang*

A Multi-dimensional Personalization Approach to Developing Adaptive Learning Systems

*Tzu-Chi Yang, Gwo-Jen Huang, Tosti H.C. Chiang, and Stephen J.H. Yang*

Extending the AAT Tool with a User-Friendly and Powerful Mechanism to Retrieve Complex Information from Educational Log Data

*Stephen Kladisch, Cindy Ives, Nancy Parker, and Sabine Graf*
Automating the E-learning Personalization ........................................ 342
  Fathi Essalmi, Leila Jemni Ben Ayed, Mohamed Jemni,
  Kinshuk, and Sabine Graf

Teaching Computational Thinking Skills in C3STEM with Traffic
Simulation ................................................................. 350
  Anton Dukeman, Faruk Caglar, Shashank Shekhar,
  John S. Kinnebrew, Gautam Biswas, Doug Fisher, and
  Aniruddha Gokhale

Learning Analytics to Support the Use of Virtual Worlds in the
Classroom ............................................................... 358
  Michael D. Kickmeier-Rust and Dietrich Albert

Visualization and Data Analytics

Evaluation of Optimized Visualization of LiDAR Point Clouds, Based
on Visual Perception .................................................... 366
  Sašo Pečnik, Domen Mongus, and Borut Žalik

Visualising the Attributes of Biological Cells, Based on Human
Perception ............................................................... 386
  Denis Horvat, Borut Žalik, Marjan Slak Rupnik, and Domen Mongus

Interactive Visual Transformation for Symbolic Representation of
Time-Oriented Data .................................................... 400
  Tim Lammarsch, Wolfgang Aigner, Alessio Bertone, Markus Bögl,
  Theresia Gschwandtner, Silvia Miksch, and Alexander Rind

Organizing Documents to Support Activities .......................... 420
  Anna Zacchi and Frank M. Shipman III

Author Index ............................................................. 441