LAK 2013: Third International Conference on

Learning Analytics and Knowledge

8 – 12 April 2013

Organized By:

SOLAR SOCIETY for LEARNING ANALYTICS RESEARCH

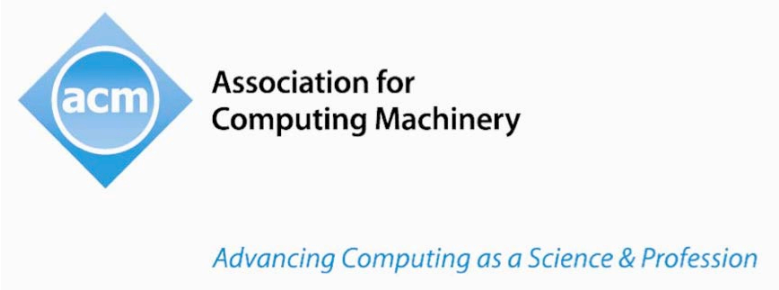
KATHOLIEKE UNIVERSITEIT LEUVEN

acm In-Cooperation

SIGCHI special interest group computer human interaction

sigweb

www.lakconference.org



The Association for Computing Machinery
2 Penn Plaza, Suite 701
New York New York 10121-0701

ACM ISBN: 978-1-4503-1785-6

LAK 2013 Chairs' Welcome

Welcome to the third edition of the Learning Analytics and Knowledge conference. This year, the medieval and, at the same time, modern city of Leuven, Belgium is the venue where researchers and practitioners of this exciting field come together to discuss current status and future trends. Similar to Leuven, Learning Analytics is an old and new field at the same time. Old, because it deals with a problem that exists since Plato's times: how to improve the way students learn. New, because the tools used to achieve this goal, like Big Data and natural language processing, were not feasible merely 10 years ago. Leuven is also the home of beautiful centuries old buildings filled with young, smart and active students. In Learning Analytics, we can also find established researchers in the fields of Educational Research and Technology-Enhanced Learning, collaborating with a large contingent of new and promising researchers that could be called Learning Data Scientists.

As organizers of this year's conference, we had the tough job, together with the other chairs, to improve over what was an already very successful event in 2012. This year, we received almost double the number of submissions, signaling a growing interest in the field. One hundred twenty six high quality contributions made it hard for the Program Chairs and Workshop and Tutorial Chairs to select the 16 full papers, 24 short papers, 11 posters, 5 workshops, 3 tutorials and 3 panels that constitute the program of LAK-13. The acceptance rate for full papers has decreased to 28% from 39% last year, assuring that the talks that we will hear this year should be even better than the ones we attended in Vancouver. This year is also the first time that submissions were received from authors from all 5 continents. While there is still a predominance of North American and European researchers in LAK-13, the voices and viewpoints from other parts of the world are making their entrance in the field.

To taste the diversity of the current status of Learning Analytics research, you only need to scan these proceedings. The topics identified by the Program Chairs in the papers go from theoretical discussion of what is the role of Learning Analytics in the current scientific scene to quite technical discussions on how to apply social network analysis or discourse analytics to measure the progress of students. Whether you are a seasoned researcher or a practitioner who wants to introduce Learning Analytics in your institution, you will find great ideas in the following pages.

We hope that LAK-13 will be a place for you to meet old and new colleagues, to get up-to-date with new trends and techniques to address known and new problems and to (re)discover a field where innovation is firmly rooted in time-proven foundations, just like Leuven.

Erik Duval
University of Leuven, Belgium
General Chair

Xavier Ochoa
Escuela Superior Politécnica del Litoral, Ecuador
General Chair

Table of Contents

Behavior analysis

Affect analytics

Predictive analytics

Sequence analytics

MOOCs

Assessment

Supporting teachers

Challenges

Analytic architectures

Design briefings

Panels

Workshops

LAK 2013 Conference Organization

General Chairs

Erik Duval, University of Leuven, Belgium
Xavier Ochoa, Escuela Superior Politécnica del Litoral, Ecuador

Program Chairs

Dan Suthers, University of Hawai'i, USA
Katrien Verbert, Eindhoven University of Technology, The Netherlands

Workshop and Tutorial Chairs

Ulrich Hoppe, University of Duisburg-Essen, Germany
Nikos Manouselis, Agro-Know, Greece
Alyssa Wise, Simon Fraser University, Canada

Doctoral Consortium Chairs

Katherine Maillet, Institut National des Télécommunications, France
Ralf Klamma, RWTH Aachen University, Germany
Ravi Vatrapu, Copenhagen Business School, Denmark

Awareness, Interaction and Memory Chairs

Tony Hirst, Open University, UK
Doug Clow, Open University, UK

Local Chair

Joris Klerkx, University of Leuven, Belgium

Program Committee

Tel Amiel, Universidade Estadual do Campinas, Brasil
Ebrahim Bagheri, Ryerson University, Canada
Ryan Baker, Teachers College, Columbia University, USA
Paulo Blikstein, Stanford University, USA
Peter Brusilovsky, University of Pittsburgh, USA
Simon Buckingham, Open University, UK
Cristian Cechinel, Universidade Federal do Pampa, Brasil
Ming Ming Chiu, SUNY-Buffalo, USA
Kon Shing Kenneth Chung, University of Sydney, Australia
Grainne Conole, Open University, UK
Shane Dawson, The University of British Columbia, Canada
Maarten de Laat, Open Universiteit Nederland, Netherlands
Anna De Liddo, Open University, UK

Michael Derntl, RWTH Aachen, Germany
Stefan Dietze, Knowledge Media Institute, Open University, UK
Pierre Dillenbourg, École Polytechnique Fédérale de Lausanne, Switzerland
Yannis Dimitriadis, University of Valladolid, Spain
Vania Dimitrova, School of Computing, University of Leeds, UK
Hendrik Drachsler, Open Universiteit Nederland, Netherlands
Gregory Dyke, University of Lyon, France
Rebecca Ferguson, The Open University, UK
Dragan Gasevic, Athabasca University, Canada
Janice Gobert, Worcester Polytechnic Institute, USA
Sabine Graf, Athabasca University, Canada
Marek Hatala, Simon Fraser University, Canada
Caroline Haythornthwaite, University of British Columbia, Canada
Eelco Herder, L3S Research Center, Germany
Zoran Jeremic, University of Belgrade, Serbia
Jelena Jovanovic, University of Belgrade, Serbia
Judy Kay, University of Sydney, Australia
Kinshuk, Athabasca University, Canada
Paul Kirschner, Open Universiteit Nederland, Netherlands
Nancy Law, Hong Kong University, China
Stefanie Lindstaedt, Know-Center, Austria
Allison Littlejohn, Glasgow Caledonian University, Scotland
Lori Lockyer, University of Wollongong, Australia
Phillip Long, University of Queensland, Australia
Kristine Lund, University of Lyon, France
Taylor Martin, University of Texas at Austin, USA
Alejandra Martínez-Monés, University of Valladolid, Spain
Riccardo Mazza, University of Lugano, Switzerland
Patrick McAndrew, The Open University, UK
Gordon McCalla, University of Saskatchewan, Canada
Bruce McLaren, Carnegie Mellon University, USA
Agathe Merceron, Beuth University of Applied Sciences, Germany
Tanja Mitrovic, University of Canterbury, New Zealand
Louis-Philippe Morency, University of South Carolina, USA
Jad Najjar, Eummena, Belgium
Jun Oshima, Shizuoka University, Japan
Abelardo Pardo, Universidad Carlos III de Madrid, Spain
Kai Pata, Tallinn University, Estonia
Peter Reimann, University of Sydney, Australia
Cristobal Romero, Universidad de Córdoba, Spain
Carolyn Rose, Carnegie Mellon University, USA
Demetrios Sampson, University of Piraeus, Greece
Stefan Scherer, University of South Carolina, USA
Andreas Schmidt, Hochschule Karlsruhe, Germany
Hans-Christian Schmitz, Fraunhofer FIT, Germany
Bruce Sherin, Northwestern University, USA
Miguel-Angel Sicilia, University of Alcalá, Spain
George Siemens, Athabasca University, Canada
Marcus Specht, Open Universiteit Nederland, Netherlands
John Stamper, Carnegie Mellon University, USA
Stefan Trausan-Matu, University “Politehnica” Bucharest, Romania

Martin Wolpers, Fraunhofer FIT, Germany
Marcelo Worsley, Stanford University, USA
Kalina Yacef, University of Sydney, Australia
Michael Yudelson, Carnegie Mellon University, USA
Amal Zouaq, Royal Military College of Canada

LAK 2013 Additional Reviewers

Chris Brooks, University of Saskatchewan, Canada
Sandro Camargo, Universidade Federal do Pampa, Brasil
Moushir M. El-Bishouty, Athabasca University, Canada
Paulo Gaona, University of Alcalá, Spain
Jim Greer, University of Saskatchewan, Canada
Jan-Pan Hwang, National Cheng Kung University, Taiwan
Milos Kravcik, RWTH Aachen, Germany
Jing Leng, Hong Kong University, China
Leonardo Lezcano, University of Alcalá, Spain
Jingyan Lu, Hong Kong University, China
David Martin, University of Alcalá, Spain
Kasia Muldner, The University of British Columbia, Canada
Enayat Rajabi, University of Alcalá, Spain
Michael Sao Pedro, Worcester Polytechnic Institute, USA
Richard Tortorella, Athabasca University, Canada