Danilo Dessì
Tanja Käser
Mirko Marras
Elvira Popescu
Harald Sack

L2D 2021

First International Workshop on Enabling Data-Driven Decisions from Learning on the Web

Jerusalem, Israel, March 12 2021 - moved online

Proceedings

Volume Editors

Danilo Dessì
FIZ Karlsruhe - KIT, Germany
danilo.dessi@fiz-karlsruhe.de

Tanja Käser
EPFL, Switzerland
tanja.kaeser@epfl.ch

Mirko Marras
EPFL, Switzerland
mirko.marras@acm.org

Elvira Popescu
University of Craiova, Romania
elvira.popescu@edu.ucv.ro

Harald Sack
FIZ Karlsruhe - KIT, Germany
harald.sack@fiz-karlsruhe.de

Preface

The First International Workshop on Enabling Data-Driven Decisions from Learning on the Web (L2D 2021) was held as part of the 14th ACM International Conference on Web Search and Data Mining (WSDM 2021) on March 12, 2021. L2D 2021 was expected to happen in Jerusalem, Israel, but due to the COVID-19 emergency and the consequent travel restrictions, the workshop was held online. The workshop was jointly organized by the FIZ Karlsruhe – Leibniz Institute for Information Infrastructure & Karlsruhe Institute of Technology (Germany), by the École Polytechnique Fédérale de Lausanne - EPFL (Switzerland), and by the University of Craiova (Romania).

The workshop collected novel, original research on the state of the art of online education empowered with data mining and machine learning, providing a common ground for researchers, practitioners, and stakeholders working in this area. The workshop day included six paper presentations, a keynote talk, and a panel discussion to highlight open issues, research challenges, future research directions, and briefly summarise the outcomes of the workshop. More than 50 participants were registered and participated in the workshop.

In total, 11 submissions from different countries were received. The final program included 3 full papers and 3 short papers (acceptance rate 54%). All submissions were single-blind peer-reviewed by at least three internal Program Committee members on the basis of relevance for the workshop, novelty/originality, significance, technical quality and correctness, quality and clarity of presentation, quality of references and reproducibility, to ensure that only submissions of high quality were included in the workshop program. Full paper authors were given 15 minutes to present their work, with 5 minutes for questions and answers. Conversely, short paper authors used 12 minutes to present and 3 minutes were left for questions and answers. The presentations covered topics that go from the integration of context information for knowledge tracing, over analyses to identify learning patterns in students' teams working on business cases and in students experiencing synchronous online learning, to studies that provide evidence on learning testing models through mobile applications, as examples.

In addition to the paper presentations, the program included a 45-min keynote talk given by Prof. Marcus Specht from the Technical University of Delft (TU Delft), The Netherlands. Prof. Specht introduced the characteristics of the context where digital education is taking place, highlighting a range of important challenges and possible solutions to them at each point of the educational pipeline. In particular, the role of continuous feedback among stakeholders (e.g., researchers, students, teachers) at each stage of the design and delivering process was emphasized as a key aspect of formative assessment and as one of the most important influences in learning and teaching digitally.

Furthermore, the workshop included a 40-min panel with four representatives from top-tier education companies, engaged in a discussion moderated by the

workshop organizers. This panel aimed to strengthen the connection between the academic and the industrial data mining and machine learning communities working in education, which have plenty to teach to each other, developing synergies between the two. The list of panelists included Brian Aronson from The Adecco Group, Beata Beigman Klebanov from Educational Testing Service (ETS), Marianne Sorba from Coursera, and Juneyoung Park from Riiid!. The panel discussed what it means to build, deploy, and do research on top of large-scale online educational platforms in our era, how data mining and machine learning can support in understanding learners' behavior at large scale, how intelligent models can provide data-driven decisions tailored to the stakeholders' needs in modern online platforms, and which challenges are faced and how academia and industry can collaborate to address them. Finding answers to these questions is crucial to ensure the systems we develop improve the online education ecosystem and, with this panel, we brought a variety of perspectives from industry to discuss these questions and foster synergies in this vibrant area.

Overall, the workshop was a successful event, as shown by the level of participation and the quality of the contributions during the presentations and the panel discussion. We believe that this workshop strengthened the community working on data mining and machine learning in education, promoting discussions on ideas and solutions for the current challenges, favouring the creation of networks of researchers for future initiatives. Plans to organize the second edition of the workshop were formed. The organizers would like to sincerely thank the main conference organizers, the keynote and panel speakers, the paper authors, the programme committee, and the attendees for their valuable contribution to make this workshop a success.

May 2021

[Danilo Dessì]
[Tanja Käser]
[Mirko Marras]
[Elvira Popescu]
[Harald Sack]

Organization

Workshop Chairs

Danilo Dessì	FIZ Karlsruhe & KIT, Germany
Tanja Käser	EPFL, Switzerland
Mirko Marras	EPFL, Switzerland
Elvira Popescu	University of Craiova, Romania
Harald Sack	FIZ Karlsruhe & KIT, Germany

Program Committee

Mehwish Alam	FIZ Karlsruhe & KIT, Germany
Fahriye Altınay Aksal	Near East University, Cyprus
Geoffray Bonnin	LORIA, France
Ludovico Boratto	Eurecat - Centre Tecnòlogic de Catalunya, Spain
Javier Bravo-Agapito	Madrid Open University, Spain
Gong Cheng	Nanjing University, China
Irene-Angelica Chounta	University of Tartu, Estonia
Mathieu D'Aquin	National University of Ireland Galway, Ireland
Daniele Di Mitri	DIPF — Leibniz Institute for Research and Information in Education, Germany
Ralph Ewerth	L3S Research Center, Leibniz Universität Hannover, Germany
Davide Fossati	Emory University, United States
Erik Hemberg	Massachusetts Institute of Technology, United States
Eelco Herder	Radboud University, The Netherlands
Martin Hlosta	The Open University, United Kingdom
Fabian Hoppe	FIZ Karlsruhe & KIT, Germany
Ioana Jivet	TU Delft, The Netherlands
Zuzana Kubincová	Comenius University, Slovakia
Collin Lynch	North Carolina State University, United States
Pasquale Lisena	EURECOM, France
Matteo Lombardi	Griffith University, Australia
Francesca Maridina Malloci	University of Cagliari, Italy
Martino Mensio	The Open University, United Kingdom
Donatella Merlini	University of Florence, Italy
Angelo Antonio Salatino	The Open University, United Kingdom
Nadine Steinmetz	TU Ilmenau, Germany
Tabea Tietz	FIZ Karlsruhe & KIT, Germany

Chairs and program committee members are in alphabetical order by lastname.

Table of Contents