

Founding Editors

Gerhard Goos

Karlsruhe Institute of Technology, Karlsruhe, Germany

Juris Hartmanis

Cornell University, Ithaca, NY, USA

Editorial Board Members

Elisa Bertino

Purdue University, West Lafayette, IN, USA

Wen Gao

Peking University, Beijing, China

Bernhard Steffen 

TU Dortmund University, Dortmund, Germany

Gerhard Woeginger 

RWTH Aachen, Aachen, Germany

Moti Yung 

Columbia University, New York, NY, USA

More information about this series at <https://link.springer.com/bookseries/558>

Matthias Hagen · Suzan Verberne ·
Craig Macdonald · Christin Seifert ·
Krisztian Balog · Kjetil Nørvåg ·
Vinay Setty (Eds.)

Advances in Information Retrieval

44th European Conference on IR Research, ECIR 2022
Stavanger, Norway, April 10–14, 2022
Proceedings, Part II



Springer

Editors

Matthias Hagen

Martin Luther University Halle-Wittenberg
Halle, Germany

Craig Macdonald

University of Glasgow
Glasgow, UK

Krisztian Balog

University of Stavanger
Stavanger, Norway

Vinay Setty

University of Stavanger
Stavanger, Norway

Suzan Verberne

Leiden University
Leiden, The Netherlands

Christin Seifert

University of Duisburg-Essen
Essen, Germany

Kjetil Nørvåg

Norwegian University of Science
and Technology
Trondheim, Norway

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-030-99738-0

ISBN 978-3-030-99739-7 (eBook)

<https://doi.org/10.1007/978-3-030-99739-7>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022, corrected publication 2023

Chapters “Leveraging Customer Reviews for E-commerce Query Generation” and “End to End Neural Retrieval for Patent Prior Art Search” are licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>). For further details see license information in the chapter.

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The 44th European Conference on Information Retrieval (ECIR 2022) was held in Stavanger, Norway, during April 10–14, 2022, and brought together hundreds of researchers from Europe and abroad. The conference was organized by the University of Stavanger, in cooperation with the British Computer Society’s Information Retrieval Specialist Group (BCS IRSG).

These proceedings contain the papers related to the presentations, workshops, and tutorials given during the conference. This year’s ECIR program boasted a variety of novel work from contributors from all around the world. In total, 395 papers from authors in 53 countries were submitted to the different tracks.

The final program included 35 full papers (20% acceptance rate), 29 short papers (22% acceptance rate), 12 demonstration papers (55% acceptance rate), 11 reproducibility papers (61% acceptance rate), 12 doctoral consortium papers (71% acceptance rate), and 13 invited CLEF papers. All submissions were peer-reviewed by at least three international Program Committee members to ensure that only submissions of the highest relevance and quality were included in the final program. The acceptance decisions were further informed by discussions among the reviewers for each submitted paper, led by a senior Program Committee member.

The accepted papers cover the state of the art in information retrieval: advances in ranking models, applications of entities and knowledge graphs, evaluation, multimodal retrieval, recommender systems, query understanding, user simulation studies, etc. As in previous years, the ECIR 2022 program contained a high proportion of papers with students as first authors, as well as papers from a variety of universities, research institutes, and commercial organizations.

In addition to the papers, the program also included three keynotes, four tutorials, five workshops, a doctoral consortium, the presentation of selected papers from the 2021 issues of the Information Retrieval Journal, and an industry day. Keynote talks were given by Isabelle Augenstein (University of Copenhagen), Peter Flach (University of Bristol), and this year’s BCS IRSG Karen Spärck Jones Award winner, Ivan Vulić (University of Cambridge & PolyAI). The tutorials covered a range of topics including high recall retrieval, incrementally testing for online advertising, information extraction from social media, and keyphrase identification, while the workshops brought together participants to discuss algorithmic bias in search and recommendation (BIAS), bibliometrics (BIR), online misinformation (ROMCIR), narrative extraction (Text2Story), and technology-assisted review systems (ALTARS).

The success of ECIR 2022 would not have been possible without all the help from the team of volunteers and reviewers. We wish to thank all the reviewers and meta-reviewers who helped to ensure the high quality of the program. We also wish to thank the reproducibility chairs: Faegheh Hasibi and Carsten Eickhoff; the demo chairs: Theodora Tsikrika and Udo Kruschwitz; the workshop chairs: Lucie Flek and Javier Parapar; the tutorial chairs: Nazli Goharian and Shuo Zhang; the industry chairs: Jiyin

He and Marcel Worring; the doctoral consortium chairs: Asia Biega and Alistair Moffat; and the awards chair: Maarten de Rijke. We would like to thank our local administration chair, Russel Wolff, along with all the student volunteers who helped to create an excellent online and offline experience for participants and attendees.

ECIR 2022 was sponsored by Amazon, Bloomberg, Cobrainer, Elsevier, Google, the L3S Research Center, MediaFutures, the Norwegian University of Science and Technology, NorwAI, Schibsted, SIGIR, Signal AI, Spotify, Springer, Textkernel, Thomson Reuters, the University of Stavanger, Vespa AI, and Wayfair. We thank them all for their support.

Finally, we wish to thank all the authors and contributors to the conference.

April 2022

Matthias Hagen
Suzan Verberne
Craig Macdonald
Christin Seifert
Krisztian Balog
Kjetil Nørvåg

Organization

General Chairs

Krisztian Balog University of Stavanger, Norway
Kjetil Nørvåg NTNU, Norway

Program Chairs – Full Papers

Suzan Verberne Leiden University, The Netherlands
Matthias Hagen Martin-Luther-Universität Halle-Wittenberg, Germany

Program Chairs – Short Papers

Christin Seifert University of Duisburg-Essen, Germany
Craig Macdonald University of Glasgow, UK

Reproducibility Track Chairs

Faegheh Hasibi
Carsten Eickhoff Radboud University, The Netherlands
Brown University, USA

Demo Chairs

Theodora Tsikrika
Udo Kruschwitz
Information Technologies Institute, CERTH, Greece
University of Regensburg, Germany

Workshop Chairs

Lucie Flek
Javier Parapar

Tutorials Chairs

Nazli Goharian Georgetown University, USA
Shuo Zhang Bloomberg, UK

Industry Day Chairs

Jiyin He Signal AI, UK
Marcel Worring University of Amsterdam, The Netherlands

Doctoral Consortium Chairs

Asia Biega	Max Planck Institute for Security and Privacy, Germany
Alistair Moffat	University of Melbourne, Australia

Awards Chair

Maarten de Rijke	University of Amsterdam, The Netherlands
------------------	--

Local Organization Chairs

Vinay Setty	University of Stavanger, Norway
Russel Wolff	University of Stavanger, Norway

Program Committee

Qingyao Ai	University of Utah, USA
Dyaa Albakour	Signal AI, UK
Mohammad Aliannejadi	University of Amsterdam, The Netherlands
Satya Almasian	Heidelberg University, Germany
Omar Alonso	Instacart, USA
Sophia Althammer	TU Vienna, Austria
Ismail Sengor Altingovde	Bilkent University, Turkey
Giuseppe Amato	ISTI-CNR, Italy
Enrique Amigó	UNED, Spain
Avishek Anand	L3S Research Center, Germany
Linda Andersson	Artificial Researcher IT GmbH and TU Wien, Austria
Negar Arabzadeh	University of Waterloo, Canada
Ioannis Arapakis	Telefonica Research, Spain
Jaime Arguello	University of North Carolina at Chapel Hill, USA
Arian Askari	Shahid Beheshti University, Iran
Maurizio Atzori	University of Cagliari, Italy
Sandeep Avula	Amazon, USA
Leif Azzopardi	University of Strathclyde, UK
Mossaab Bagdouri	Walmart Labs, USA
Ebrahim Bagheri	Ryerson University, Canada
Seyed Ali Bahreinian	IDSIA, Swiss AI Lab, Switzerland
Georgios Balikas	Salesforce Inc, France
Valeria Baranova	RMIT University, Australia
Alvaro Barreiro	University of A Coruña, Spain
Alberto Barrón-Cedeño	University of Bologna, Italy
Alejandro Bellogín	Universidad Autonoma de Madrid, Spain
Patrice Bellot	CNRS, LSIS, Aix-Marseille Université, France
Michael Bendersky	Google, USA
Alessandro Benedetti	Sease, UK

Klaus Berberich	Saarbruecken University of Applied Sciences, Germany
Sumit Bhatia	Adobe Inc., India
Paheli Bhattacharya	Indian Institute of Technology Kharagpur, India
Roi Blanco	Amazon, Spain
Alexander Bondarenko	Martin-Luther-Universität Halle-Wittenberg, Germany
Ludovico Boratto	University of Cagliari, Italy
Gloria Bordogna	CNR, Italy
Mohand Boughanem	IRIT, Université Toulouse III - Paul Sabatier, France
Leonid Boytsov	BCAI, USA
Alex Brandsen	Leiden University, The Netherlands
Pavel Braslavski	Ural Federal University, Russia
Timo Breuer	TH Köln, Germany
Fidel Cacheda	Universidade da Coruña, Spain
Jamie Callan	Carnegie Mellon University, USA
Rodrigo Calumby	State University of Feira de Santana, Brazil
Ricardo Campos	Polytechnic Institute of Tomar and INESC TEC, Portugal
Zeljko Carevic	GESIS Leibniz Institute for the Social Sciences, Germany
Ben Carterette	Spotify, USA
Shubham Chatterjee	University of New Hampshire, USA
Tao Chen	Google Research, USA
Xuanang Chen	University of Chinese Academy of Sciences, China
Adrian-Gabriel Chifu	CNRS, LIS, Aix-Marseille Université and Université de Toulon, France
Charles Clarke	University of Waterloo, Canada
Maarten Clements	TomTom, The Netherlands
Stephane Clinchant	Xerox Research Centre Europe, France
Paul Clough	University of Sheffield, UK
Juan Soler Company	Pompeu Fabra University, Spain
Alessio Conte	University of Pisa, Italy
Gordon Cormack	University of Waterloo, Canada
Anita Crescenzi	University of North Carolina at Chapel Hill, USA
Fabio Crestani	University of Lugano, Switzerland
Bruce Croft	University of Massachusetts Amherst, USA
Arthur Câmara	Delft University of Technology, The Netherlands
Arjen de Vries	Radboud University, The Netherlands
Yashar Deldjoo	Polytechnic University of Bari, Italy
Elena Demidova	University of Bonn, Germany
Emanuele Di Buccio	University of Padua, Italy
Giorgio Maria Di Nunzio	University of Padua, Italy
Gaël Dias	Normandy University, France
Laura Dietz	University of New Hampshire, USA
Anne Dirkson	Leiden University, The Netherlands
Vlastislav Dohnal	Masaryk University, Czech Republic

Shiri Dori-Hacohen	University of Connecticut, USA
Dennis Dosso	University of Padua, Italy
Pan Du	Thomson Reuters Labs, Canada
Tamer Elsayed	Qatar University, Qatar
Liana Ermakova	Université de Bretagne Occidentale, France
Ralph Ewerth	L3S Research Center, Germany
Anjie Fang	Amazon, USA
Hui Fang	University of Delaware, USA
Hossein Fani	University of Windsor, Canada
Juan M. Fernández-Luna	University of Granada, Spain
Nicola Ferro	University of Padua, Italy
John Foley	Smith College, USA
Thibault Formal	Naver Labs Europe, France
Ophir Frieder	Georgetown University, USA
Ingo Frommholz	University of Wolverhampton, UK
Maik Fröbe	Martin-Luther-Universität Halle-Wittenberg, Germany
Norbert Fuhr	University of Duisburg-Essen, Germany
Michael Färber	Karlsruhe Institute of Technology, Germany
Ujwal Gadiraju	Delft University of Technology, The Netherlands
Debasis Ganguly	University of Glasgow, UK
Dario Garigliotti	Aalborg University, Denmark
Eric Gaussier	LIG-UJF, France
Kripabandhu Ghosh	IISER Kolkata, India
Anastasia Giachanou	Universitat Politècnica de València, Spain
Lukas Gienapp	Leipzig University, Germany
Lorraine Goeuriot	Université Grenoble Alpes, France
Simon Gog	Karlsruhe Institute of Technology, Germany
Marcos Goncalves	Federal University of Minas Gerais, Brazil
Julio Gonzalo	UNED, Spain
Michael Granitzer	University of Passau, Germany
Adrien Guille	Université de Lyon, France
Jiafeng Guo	Institute of Computing Technology, China
Cathal Gurrin	Dublin City University, Ireland
Martin Halvey	University of Strathclyde, UK
Lei Han	University of Queensland, Australia
Allan Hanbury	Vienna University of Technology, Austria
Preben Hansen	Stockholm University, Sweden
Donna Harman	NIST, USA
Morgan Harvey	University of Sheffield, UK
Maram Hasanain	Qatar University, Qatar
Faegheh Hasibi	Radboud University, The Netherlands
Claudia Hauff	Delft University of Technology, The Netherlands
Ben He	University of Chinese Academy of Sciences, China
Daniel Hienert	GESIS - Leibniz Institute for the Social Sciences, Germany
Michiel Hildebrand	Spinque, The Netherlands

Gilles Hubert	IRIT, France
Bogdan Ionescu	Politehnica University of Bucharest, Romania
Radu Tudor Ionescu	University of Bucharest, Romania
Adam Jatowt	University of Innsbruck, Austria
Faizan Javed	Kaiser Permanente, USA
Shiyu Ji	University of California, Santa Barbara, USA
Jiepu Jiang	University of Wisconsin-Madison, USA
Hideo Joho	University of Tsukuba, Japan
Gareth Jones	Dublin City University, Ireland
Joemon Jose	University of Glasgow, UK
Chris Kamphuis	Radboud University, The Netherlands
Jaap Kamps	University of Amsterdam, The Netherlands
Nattiya Kanhabua	SCG CBM, Thailand
Sumanta Kashyapi	NIT Hamirpur, India
Liadh Kelly	Maynooth University, Ireland
Roman Kern	Graz University of Technology, Austria
Oren Kurland	Technion - Israel Institute of Technology, Israel
Mucahid Kutlu	TOBB University of Economics and Technology, Turkey
Saar Kuzi	Amazon, USA
Jochen L. Leidner	Refinitiv Labs and University of Sheffield, UK
Mark Levene	Birkbeck, University of London, UK
Elisabeth Lex	Graz University of Technology, Austria
Xiangsheng Li	Tsinghua University, China
Shangsong Liang	Sun Yat-sen University, China
Jimmy Lin	University of Waterloo, Canada
Matteo Lissandrini	Aalborg University, Denmark
Haiming Liu	University of Bedfordshire, UK
Yiqun Liu	Tsinghua University, China
Sean MacAvaney	University of Glasgow, UK
Andrew Macfarlane	City, University of London, UK
Joel Mackenzie	University of Melbourne, Australia
Eddy Maddalena	King's College London, UK
Joao Magalhaes	Universidade NOVA de Lisboa, Portugal
Maria Mastro	University of Copenhagen, Denmark
Antonio Mallia	New York University, USA
Behrooz Mansouri	University of Tehran, Iran
Jiaxin Mao	Renmin University of China, China
Stefano Marchesin	University of Padua, Italy
Mirko Marras	University of Cagliari, Italy
Monica Marrero	Europeana Foundation, The Netherlands
Bruno Martins	University of Lisbon, Portugal
Yosi Mass	IBM Haifa Research Lab, Israel
Jeanna Matthews	Clarkson University, USA
David Maxwell	TU Delft, The Netherlands

Philipp Mayr	GESIS - Leibniz-Institute for the Social Sciences, Germany
Richard McCreadie	University of Glasgow, UK
Graham McDonald	University of Glasgow, UK
Edgar Meij	Bloomberg L.P., UK
Ida Mele	IASI-CNR, Italy
Massimo Melucci	University of Padua, Italy
Zaiqiao Meng	University of Glasgow, UK
Donald Metzler	Google, USA
Stefano Mizzaro	University of Udine, Italy
Ali Montazerghaem	University of Massachusetts Amherst, USA
Jose Moreno	IRIT, Université Toulouse III - Paul Sabatier, France
Yashar Moshfeghi	University of Strathclyde, UK
Josiane Mothe	IRIT, France
Philippe Mulhem	LIG-CNRS, France
Cristina Ioana Muntean	ISTI-CNR, Italy
Vanessa Murdock	Amazon, USA
Henning Müller	HES-SO, Switzerland
Franco Maria Nardini	ISTI-CNR, Italy
Wolfgang Nejdl	L3S Research Center, Germany
Jian-Yun Nie	University de Montreal, Canada
Michael Oakes	University of Wolverhampton, UK
Doug Oard	University of Maryland, USA
Harrie Oosterhuis	Radboud University, The Netherlands
Salvatore Orlando	Università Ca' Foscari Venezia, Italy
Iadh Ounis	University of Glasgow, UK
Pooja Oza	University of New Hampshire, USA
Deepak Padmanabhan	Queen's University Belfast, Ireland
Panagiotis Papadakos	FORTH-ICS, Greece
Javier Parapar	Universidade da Coruña, Spain
Pavel Pecina	Charles University in Prague, Czech Republic
Gustavo Penha	Delft University of Technology, The Netherlands
Giulio Ermanno Pibiri	ISTI-CNR, Italy
Karen Pinel-Sauvagnat	IRIT, France
Florina Piroi	TU Wien, Austria
Benjamin Piwowarski	CNRS, Sorbonne Université, France
Martin Potthast	Leipzig University, Germany
Chen Qu	Google and University of Massachusetts Amherst, USA
Pernilla Qvarfordt	FX Palo Alto Laboratory, USA
Filip Radlinski	Google, UK
Gábor Recski	TU Wien, Austria
David Reiley	Google, USA
Zhaochun Ren	Shandong University, China
Jean-Michel Renders	Naver Labs Europe, France

Kirk Roberts	University of Texas Health Science Center at Houston, USA
Adam Roegiest	Zuva, Canada
Kevin Roitero	University of Udine, Italy
Stevan Rudinac	University of Amsterdam, The Netherlands
Tony Russell-Rose	Goldsmiths, University of London, UK
Rishiraj Saha Roy	Max Planck Institute for Informatics, Germany
Tetsuya Sakai	Waseda University, Japan
Michail Salampasis	Vienna University of Technology, Austria
Shadi Saleh	Institute of Formal and Applied Linguistics, Czech Republic
Mark Sanderson	RMIT University, Australia
Javier Sanz-Cruzado	Universidad Autónoma de Madrid, Spain
Sheikh Muhammad Sarwar	University of Massachusetts Amherst, USA
Harry Scells	University of Queensland, Australia
Philipp Schaer	TH Köln, Germany
Ralf Schenkel	Trier University, Germany
Ferdinand Schlatt	Martin-Luther Universität Halle-Wittenberg, Germany
Jörg Schlötterer	University of Duisburg-Essen, Germany
Fabrizio Sebastiani	CNR, Italy
Christin Seifert	University of Duisburg-Essen, Germany
Procheta Sen	Indian Statistical Institute, India
Chirag Shah	University of Washington, USA
Mahsa S. Shahshahani	Accenture, The Netherlands
Azadeh Shakery	University of Tehran, Iran
Eilon Sheetrit	Technion - Israel Institute of Technology, Israel
Jerry Jiale Shen	Queen's University Belfast, UK
Michal Siedlaczek	New York University, USA
Gianmaria Silvello	University of Padua, Italy
Fabrizio Silvestri	University of Rome, Italy
Mark Smucker	University of Waterloo, Canada
Laure Soulier	ISIR, Sorbonne Université, France
Marc Spaniol	Université de Caen Normandie, France
Damiano Spina	RMIT University, Australia
Andreas Spitz	University of Konstanz, Germany
Hussein Suleman	University of Cape Town, South Africa
Aixin Sun	Nanyang Technological University, Singapore
Lynda Tamine	IRIT, France
Carla Teixeira Lopes	University of Porto, Portugal
Paul Thomas	Microsoft, Australia
Elaine Toms	University of Sheffield, UK
Nicola Tonellotto	University of Pisa, Italy
Salvatore Trani	ISTI-CNR, Italy
Jan Trienes	University of Duisburg-Essen, Germany
Manos Tsagkias	Apple Inc., The Netherlands
Theodora Tsikrika	Information Technologies Institute, CERTH, Greece

Yannis Tzitzikas	University of Crete and FORTH-ICS, Greece
Md Zia Ullah	CNRS, France
Manisha Verma	Amazon, UK
Vishwa Vinay	Adobe Research, India
Marco Viviani	Università degli Studi di Milano-Bicocca, Italy
Michael Völske	Bauhaus-Universität Weimar, Germany
Xi Wang	University of Glasgow, UK
Zhihong Wang	Tsinghua University, China
Zhijing Wu	Tsinghua University, China
Xiaohui Xie	Tsinghua University, China
Eugene Yang	Johns Hopkins University, USA
Andrew Yates	University of Amsterdam, The Netherlands
Ran Yu	GESIS - Leibniz Institute for the Social Sciences, Germany
Eva Zangerle	University of Innsbruck, Austria
Richard Zanibbi	Rochester Institute of Technology, USA
Fattane Zarrinkalam	University of Guelph, Canada
Sergej Zerr	L3S Research Center, Germany
Junqi Zhang	Tsinghua University, China
Min Zhang	Tsinghua University, China
Rongting Zhang	Amazon, USA
Ruqing Zhang	Chinese Academy of Sciences, China
Yongfeng Zhang	Rutgers, The State University of New Jersey, USA
Liting Zhou	Dublin City University, Ireland
Steven Zimmerman	University of Essex, UK
Justin Zobel	University of Melbourne, Australia
Guido Zuccon	University of Queensland, Australia

Additional Reviewers

Aumiller, Dennis	Gerritse, Emma
Bartscherer, Frederic	Ghauri, Junaid
Belém, Fabiano	Gottschalk, Simon
Bigdeli, Amin	Gémes, Kinga
Biswas, Debanjali	Gérald, Thomas
Cheema, Gullal	Haak, Fabian
Chen, Fumian	Hamidi Rad, Radin
Cunha, Washington	Hoppe, Anett
Dashti, Arman	Huang, Jin
Ebrahimzadeh, Ehsan	Kamateri, Eleni
Engelmann, Björn	Kanase, Sameer
Feher, Gloria	Khawar, Farhan
Ferreira, Thiago	Knyazev, Norman
Fortes, Reinaldo	Leonhardt, Jurek
França, Celso	Liu, Siwei

Lodhia, Zeeshan Ahmed
Mahdavimoghaddam, Jalehsadat
Mamedov, Murad
Mangaravite, Vítor
Marcia, Diego
Mayerl, Maximilian
Mountantonakis, Michalis
Müller-Budack, Eric
Navarrete, Evelyn
Nguyen, Hoang
Paiva, Bruno
Pérez Vila, Miguel Anxo
Ramos, Rita
Renders, Jean-Michel

Saier, Tarek
Sanguinetti, Manuela
Santana, Brenda
Seyedsalehi, Shirin
Shliselberg, Michael
Soprano, Michael
Springstein, Matthias
Stamatis, Vasileios
Su, Ting
Tempelmeier, Nicolas
Viegas, Felipe
Vo, Duc-Thuan
Zhang, Yue
Ziaeinejad, Soroush

Sponsors

Platinum Sponsors



Gold Sponsor



Silver Sponsors**cobrainer****ELSEVIER****Media
Futures •****Bronze Sponsors****NorwAI****Schibsted**



Machine Intelligence for People and Jobs



Industry Impact Award Sponsor



With Generous Support From



Contents – Part II

Short Papers

Improving BERT-based Query-by-Document Retrieval with Multi-task Optimization	3
<i>Amin Abolghasemi, Suzan Verberne, and Leif Azzopardi</i>	
Passage Retrieval on Structured Documents Using Graph Attention Networks	13
<i>Lucas Albareda, Philippe Mulhem, Lorraine Goeuriot, Claude Le Pape-Gardeux, Sylvain Marie, and Trinidad Chardin-Segui</i>	
Expert Finding in Legal Community Question Answering	22
<i>Arian Askari, Suzan Verberne, and Gabriella Pasi</i>	
Towards Building Economic Models of Conversational Search	31
<i>Leif Azzopardi, Mohammad Aliannejadi, and Evangelos Kanoulas</i>	
Evaluating the Use of Synthetic Queries for Pre-training a Semantic Query Tagger	39
<i>Elias Bassani and Gabriella Pasi</i>	
A Light-Weight Strategy for Restraining Gender Biases in Neural Rankers	47
<i>Amin Bigdeli, Negar Arabzadeh, Shirin SeyedSalehi, Morteza Zihayat, and Ebrahim Bagheri</i>	
Recommender Systems: When Memory Matters	56
<i>Aleksandra Burashnikova, Marianne Clausel, Massih-Reza Amini, Yury Maximov, and Nicolas Dante</i>	
Groupwise Query Performance Prediction with BERT	64
<i>Xiaoyang Chen, Ben He, and Le Sun</i>	
How Can Graph Neural Networks Help Document Retrieval: A Case Study on CORD19 with Concept Map Generation	75
<i>Hejie Cui, Jiaying Lu, Yao Ge, and Carl Yang</i>	
Leveraging Content-Style Item Representation for Visual Recommendation	84
<i>Yashar Deldjoo, Tommaso Di Noia, Daniele Malitesta, and Felice Antonio Merra</i>	

Does Structure Matter? Leveraging Data-to-Text Generation for Answering Complex Information Needs	93
<i>Hanane Djeddal, Thomas Gerald, Laure Soulier, Karen Pinel-Sauvagnat, and Lynda Tamine</i>	
Temporal Event Reasoning Using Multi-source Auxiliary Learning Objectives	102
<i>Xin Dong, Tanay Kumar Saha, Ke Zhang, Joel Tetreault, Alejandro Jaimes, and Gerard de Melo</i>	
Enhanced Sentence Meta-Embeddings for Textual Understanding	111
<i>Sourav Dutta and Haytham Assem</i>	
Match Your Words! A Study of Lexical Matching in Neural Information Retrieval	120
<i>Thibault Formal, Benjamin Piwowarski, and Stéphane Clinchant</i>	
CARES: CAuse Recognition for Emotion in Suicide Notes	128
<i>Soumitra Ghosh, Swarup Roy, Asif Ekbal, and Pushpak Bhattacharyya</i>	
Identifying Suitable Tasks for Inductive Transfer Through the Analysis of Feature Attributions	137
<i>Alexander J. Hepburn and Richard McCreadie</i>	
Establishing Strong Baselines For TripClick Health Retrieval	144
<i>Sebastian Hofstätter, Sophia Althammer, Mete Sertkan, and Allan Hanbury</i>	
Less is Less: When are Snippets Insufficient for Human vs Machine Relevance Estimation?	153
<i>Gabriella Kazai, Bhaskar Mitra, Anlei Dong, Nick Craswell, and Linjun Yang</i>	
Leveraging Transformer Self Attention Encoder for Crisis Event Detection in Short Texts	163
<i>Pantelis Kyriakidis, Despoina Chatzakou, Theodora Tsikrika, Stefanos Vrochidis, and Ioannis Kompatsiaris</i>	
What Drives Readership? An Online Study on User Interface Types and Popularity Bias Mitigation in News Article Recommendations	172
<i>Emanuel Lacic, Leon Fadljevic, Franz Weissenboeck, Stefanie Lindstaedt, and Dominik Kowald</i>	
GameOfThronesQA: Answer-Aware Question-Answer Pairs for TV Series	180
<i>Aritra Kumar Lahiri and Qinmin Vivian Hu</i>	

Leveraging Customer Reviews for E-commerce Query Generation	190
<i>Yen-Chieh Lien, Rongting Zhang, F. Maxwell Harper, Vanessa Murdock, and Chia-Jung Lee</i>	
Question Rewriting? Assessing Its Importance for Conversational Question Answering	199
<i>Gonçalo Raposo, Rui Ribeiro, Bruno Martins, and Luísa Coheur</i>	
How Different are Pre-trained Transformers for Text Ranking?	207
<i>David Rau and Jaap Kamps</i>	
Comparing Intrinsic and Extrinsic Evaluation of Sensitivity Classification	215
<i>Mahmoud F. Sayed, Nishanth Mallekav, and Douglas W. Oard</i>	
Zero-Shot Recommendation as Language Modeling.	223
<i>Damien Sileo, Wout Vossen, and Robbe Raymaekers</i>	
What Matters for Shoppers: Investigating Key Attributes for Online Product Comparison	231
<i>Nikhita Vedula, Marcus Collins, Eugene Agichtein, and Oleg Rokhlenko</i>	
Evaluating Simulated User Interaction and Search Behaviour	240
<i>Saber Zerhoudi, Michael Granitzer, Christin Seifert, and Joerg Schloetterer</i>	
Multilingual Topic Labelling of News Topics Using Ontological Mapping	248
<i>Elaine Zosa, Lidia Pivovarova, Michele Boggia, and Sardana Ivanova</i>	
Demonstration Papers	
<i>raxn: A Blazing-Fast Python Library for Ranking Evaluation and Comparison</i>	259
<i>Elias Bassani</i>	
<i>DuoSearch: A Novel Search Engine for Bulgarian Historical Documents</i>	265
<i>Angel Beshirov, Suzan Hadzhieva, Ivan Koychev, and Milena Dobreva</i>	
<i>Tweet2Story: A Web App to Extract Narratives from Twitter</i>	270
<i>Vasco Campos, Ricardo Campos, Pedro Mota, and Alípio Jorge</i>	
<i>Patapasco: A Python Framework for Cross-Language Information Retrieval Experiments</i>	276
<i>Cash Costello, Eugene Yang, Dawn Lawrie, and James Mayfield</i>	
<i>City of Disguise: A Query Obfuscation Game on the ClueWeb.</i>	281
<i>Maik Fröbe, Nicola Lea Libera, and Matthias Hagen</i>	

DocTAG: A Customizable Annotation Tool for Ground Truth Creation	288
<i>Fabio Giachelle, Ornella Irrera, and Gianmaria Silvello</i>	
ALWars: Combat-Based Evaluation of Active Learning Strategies.	294
<i>Julius Gonsior, Jakob Krude, Janik Schönfelder, Maik Thiele, and Wolfgang Lehner</i>	
INForex: Interactive News Digest for Forex Investors	300
<i>Chih-Hen Lee, Yi-Shyuan Chiang, and Chuan-Ju Wang</i>	
Streamlining Evaluation with <i>ir-measures</i>	305
<i>Sean MacAvaney, Craig Macdonald, and Iadh Ounis</i>	
Turning News Texts into Business Sentiment	311
<i>Kazuhiro Seki</i>	
SolutionTailor: Scientific Paper Recommendation Based on Fine-Grained Abstract Analysis	316
<i>Tetsuya Takahashi and Marie Katsurai</i>	
Leaf: Multiple-Choice Question Generation	321
<i>Kristiyan Vachev, Momchil Hardalov, Georgi Karadzhov, Georgi Georgiev, Ivan Koychev, and Preslav Nakov</i>	

CLEF 2022 Lab Descriptions

Overview of PAN 2022: Authorship Verification, Profiling Irony and Stereotype Spreaders, Style Change Detection, and Trigger Detection: Extended Abstract	331
<i>Janek Bevendorff, Berta Chulvi, Elisabetta Fersini, Annina Heini, Mike Kestemont, Krzysztof Kredens, Maximilian Mayerl, Reyner Ortega-Bueno, Piotr Pęzik, Martin Potthast, Francisco Rangel, Paolo Rosso, Efstathios Stamatatos, Benno Stein, Matti Wiegmann, Magdalena Wolska, and Eva Zangerle</i>	
Overview of Touché 2022: Argument Retrieval: Extended Abstract	339
<i>Alexander Bondarenko, Maik Fröbe, Johannes Kiesel, Shahbaz Syed, Timon Gurcke, Meriem Beloucif, Alexander Panchenko, Chris Biemann, Benno Stein, Henning Wachsmuth, Martin Potthast, and Matthias Hagen</i>	
Introducing the HIPE 2022 Shared Task: Named Entity Recognition and Linking in Multilingual Historical Documents.	347
<i>Maud Ehrmann, Matteo Romanello, Antoine Doucet, and Simon Clematide</i>	

CLEF Workshop JOKER: Automatic Wordplay and Humour Translation	355
<i>Liana Ermakova, Tristan Miller, Orlane Puchalski, Fabio Regattin, Élise Mathurin, Sílvia Araújo, Anne-Gwenn Bosser, Claudine Borg, Monika Bokinięc, Gaelle Le Corre, Benoît Jeanjean, Radia Hannachi, Görg Mallia, Gordan Matas, and Mohamed Saki</i>	
Automatic Simplification of Scientific Texts: SimpleText Lab at CLEF- 2022	364
<i>Liana Ermakova, Patrice Bellot, Jaap Kamps, Diana Nurbakova, Irina Ovchinnikova, Eric SanJuan, Elise Mathurin, Sílvia Araújo, Radia Hannachi, Stéphane Huet, and Nicolas Poinsu</i>	
LeQua@CLEF2022: Learning to Quantify	374
<i>Andrea Esuli, Alejandro Moreo, and Fabrizio Sebastiani</i>	
ImageCLEF 2022: Multimedia Retrieval in Medical, Nature, Fusion, and Internet Applications	382
<i>Alba G. Seco de Herrera, Bogdan Ionescu, Henning Müller, Renaud Péteri, Asma Ben Abacha, Christoph M. Friedrich, Johannes Rückert, Louise Bloch, Raphael Brüngel, Ahmad Idrissi-Yaghir, Henning Schäfer, Serge Kozlovski, Yashin Dicente Cid, Vassili Kovalev, Jon Chamberlain, Adrian Clark, Antonio Campello, Hugo Schindler, Jérôme Deshayes, Adrian Popescu, Liviu-Daniel Ştefan, Mihai Gabriel Constantin, and Mihai Dogariu</i>	
LifeCLEF 2022 Teaser: An Evaluation of Machine-Learning Based Species Identification and Species Distribution Prediction	390
<i>Alexis Joly, Hervé Goëau, Stefan Kahl, Lukáš Picek, Titouan Lorieul, Elijah Cole, Benjamin Deneu, Maximilien Servajean, Andrew Durso, Isabelle Bolon, Hervé Glotin, Robert Planqué, Willem-Pier Vellinga, Holger Klinck, Tom Denton, Ivan Eggel, Pierre Bonnet, Henning Müller, and Milan Šulc</i>	
The ChEMU 2022 Evaluation Campaign: Information Extraction in Chemical Patents	400
<i>Yuan Li, Biaoyan Fang, Jiayuan He, Hiyori Yoshikawa, Saber A. Akhondi, Christian Druckenbrodt, Camilo Thorne, Zenan Zhai, Zubair Afzal, Trevor Cohn, Timothy Baldwin, and Karin Verspoor</i>	
Advancing Math-Aware Search: The ARQMath-3 Lab at CLEF 2022	408
<i>Behrooz Mansouri, Anurag Agarwal, Douglas W. Oard, and Richard Zanibbi</i>	

The CLEF-2022 CheckThat! Lab on Fighting the COVID-19 Infodemic and Fake News Detection	416
<i>Preslav Nakov, Alberto Barrón-Cedeño, Giovanni Da San Martino, Firoj Alam, Julia Maria Struß, Thomas Mandl, Rubén Míguez, Tommaso Caselli, Mucahid Kutlu, Wajdi Zaghouani, Chengkai Li, Shaden Shaar, Gautam Kishore Shahi, Hamdy Mubarak, Alex Nikolov, Nikolay Babulkov, Yavuz Selim Kartal, and Javier Beltrán</i>	

BioASQ at CLEF2022: The Tenth Edition of the Large-scale Biomedical Semantic Indexing and Question Answering Challenge	429
<i>Anastasios Nentidis, Anastasia Krithara, Georgios Paliouras, Luis Gasco, and Martin Krallinger</i>	

eRisk 2022: Pathological Gambling, Depression, and Eating Disorder Challenges	436
<i>Javier Parapar, Patricia Martín-Rodilla, David E. Losada, and Fabio Crestani</i>	

Doctoral Consortium

Continually Adaptive Neural Retrieval Across the Legal, Patent and Health Domain	445
<i>Sophia Althammer</i>	

Understanding and Learning from User Behavior for Recommendation in Multi-channel Retail	455
<i>Mozhdeh Ariannezhad</i>	

An Entity-Oriented Approach for Answering Topical Information Needs	463
<i>Shubham Chatterjee</i>	

Cognitive Information Retrieval	473
<i>Dima El Zein</i>	

Graph-Enhanced Document Representation for Court Case Retrieval	480
<i>Tobias Fink</i>	

Relevance Models Based on the Knowledge Gap	488
<i>Yasin Ghafourian</i>	

Evidence-Based Early Rumor Verification in Social Media.	496
<i>Fatima Haouari</i>	

Multimodal Retrieval in E-Commerce: From Categories to Images, Text, and Back	505
<i>Mariya Hendriksen</i>	

Medical Entity Linking in Laypersons' Language	513
<i>Annisa Maulida Ningtyas</i>	

A Topical Approach to Capturing Customer Insight Dynamics in Social Media	520
<i>Miguel Palencia-Olivar</i>	

Towards Explainable Search in Legal Text	528
<i>Sayantan Polley</i>	

End to End Neural Retrieval for Patent Prior Art Search	537
<i>Vasileios Stamatis</i>	

Workshops

Third International Workshop on Algorithmic Bias in Search and Recommendation (BIAS@ECIR2022)	547
<i>Ludovico Boratto, Stefano Faralli, Mirko Marras, and Giovanni Stilo</i>	

The 5 th International Workshop on Narrative Extraction from Texts: Text2Story 2022	552
<i>Ricardo Campos, Alípio Jorge, Adam Jatowt, Sumit Bhatia, and Marina Litvak</i>	

Augmented Intelligence in Technology-Assisted Review Systems (ALTARS 2022): Evaluation Metrics and Protocols for eDiscovery and Systematic Review Systems	557
<i>Giorgio Maria Di Nunzio, Evangelos Kanoulas, and Prasenjit Majumder</i>	

Bibliometric-enhanced Information Retrieval: 12th International BIR Workshop (BIR 2022)	561
<i>Ingo Frommholz, Philipp Mayr, Guillaume Cabanac, and Suzan Verberne</i>	

ROMCIR 2022: Overview of the 2nd Workshop on Reducing Online Misinformation Through Credible Information Retrieval	566
<i>Marinella Petrocchi and Marco Viviani</i>	

Tutorials

Online Advertising Incrementality Testing: Practical Lessons, Paid Search and Emerging Challenges	575
<i>Joel Barajas, Narayan Bhamidipati, and James G. Shanahan</i>	

From Fundamentals to Recent Advances: A Tutorial on Keyphrasification	582
<i>Rui Meng, Debanjan Mahata, and Florian Boudin</i>	

Information Extraction from Social Media: A Hands-On Tutorial on Tasks, Data, and Open Source Tools	589
<i>Shubhangshu Mishra, Rezvaneh Rezapour, and Jana Diesner</i>	
ECIR 2022 Tutorial: Technology-Assisted Review for High Recall Retrieval	597
<i>Eugene Yang, Jeremy Pickens, and David D. Lewis</i>	
Correction to: End to End Neural Retrieval for Patent Prior Art Search	C1
<i>Vasileios Stamatis</i>	
Author Index	601

Contents – Part I

Full Papers

Supercalifragilisticexpialidocious: Why Using the “Right” Readability Formula in Children’s Web Search Matters	3
<i>Garrett Allen, Ashlee Milton, Katherine Landau Wright, Jerry Alan Fails, Casey Kennington, and Maria Soledad Pera</i>	
PARM: A Paragraph Aggregation Retrieval Model for Dense Document-to-Document Retrieval	19
<i>Sophia Althammer, Sebastian Hofstätter, Mete Sertkan, Suzan Verberne, and Allan Hanbury</i>	
Recommendation of Compatible Outfits Conditioned on Style	35
<i>Debopriyo Banerjee, Lucky Dhakad, Harsh Maheshwari, Muthusamy Chelliah, Niloy Ganguly, and Arnab Bhattacharya</i>	
Why Did You Not Compare with That? Identifying Papers for Use as Baselines	51
<i>Manjot Bedi, Tanisha Pandey, Sumit Bhatia, and Tanmoy Chakraborty</i>	
Exploring Entities in Event Detection as Question Answering	65
<i>Emanuela Boros, Jose G. Moreno, and Antoine Doucet</i>	
Validating Simulations of User Query Variants	80
<i>Timo Breuer, Norbert Fuhr, and Philipp Schaer</i>	
Out-of-Domain Semantics to the Rescue! Zero-Shot Hybrid Retrieval Models	95
<i>Tao Chen, Mingyang Zhang, Jing Lu, Michael Bendersky, and Marc Najork</i>	
Incorporating Ranking Context for End-to-End BERT Re-ranking	111
<i>Xiaoyang Chen, Kai Hui, Ben He, Xianpei Han, Le Sun, and Zheng Ye</i>	
WANDS: Dataset for Product Search Relevance Assessment	128
<i>Yan Chen, Shujian Liu, Zheng Liu, Weiyi Sun, Linas Baltrunas, and Benjamin Schroeder</i>	
Searching, Learning, and Subtopic Ordering: A Simulation-Based Analysis	142
<i>Arthur Câmara, David Maxwell, and Claudia Hauff</i>	

Immediate Text Search on Streams Using Apoptotic Indexes	157
<i>Patrick Eades, Anthony Wirth, and Justin Zobel</i>	
Influence-Based Deep Network for Next POIs Prediction	170
<i>Sayda Elmi and Kian Lee Tan</i>	
A Dependency-Aware Utterances Permutation Strategy to Improve Conversational Evaluation	184
<i>Guglielmo Faggioli, Marco Ferrante, Nicola Ferro, Raffaele Perego, and Nicola Tonellootto</i>	
Sentiment Guided Aspect Conditioned Dialogue Generation in a Multimodal System	199
<i>Mauajama Firdaus, Nidhi Thakur, and Asif Ekbal</i>	
An Analysis of Variations in the Effectiveness of Query Performance Prediction	215
<i>Debasis Ganguly, Suchana Datta, Mandar Mitra, and Derek Greene</i>	
Search Clarification Selection via Query-Intent-Clarification Graph Attention	230
<i>Chang Gao and Wai Lam</i>	
Continual Learning of Long Topic Sequences in Neural Information Retrieval	244
<i>Thomas Gerald and Laure Soulier</i>	
Ensemble Model Compression for Fast and Energy-Efficient Ranking on FPGAs	260
<i>Veronica Gil-Costa, Fernando Loor, Romina Molina, Franco Maria Nardini, Raffaele Perego, and Salvatore Trani</i>	
Local Citation Recommendation with Hierarchical-Attention Text Encoder and SciBERT-Based Reranking	274
<i>Nianlong Gu, Yingqiang Gao, and Richard H. R. Hahnloser</i>	
Extending CLIP for Category-to-Image Retrieval in E-Commerce	289
<i>Mariya Hendriksen, Maurits Bleeker, Svitlana Vakulenko, Nanne van Noord, Ernst Kuiper, and Maarten de Rijke</i>	
WIDAR - Weighted Input Document Augmented ROUGE	304
<i>Raghav Jain, Vaibhav Mavi, Anubhav Jangra, and Sriparna Saha</i>	
Bi-granularity Adversarial Training for Non-factoid Answer Retrieval	322
<i>Zhilong Jin, Yu Hong, Hongyu Zhu, Jianmin Yao, and Min Zhang</i>	

RATE: A Reliability-Aware Tester-Based Evaluation Framework of User Simulators	336
<i>Sahiti Labhisetty and ChengXiang Zhai</i>	
HC4: A New Suite of Test Collections for Ad Hoc CLIR	351
<i>Dawn Lawrie, James Mayfield, Douglas W. Oard, and Eugene Yang</i>	
Did I See It Before? Detecting Previously-Checked Claims over Twitter	367
<i>Watheq Mansour, Tamer Elsayed, and Abdulaziz Al-Ali</i>	
Transfer Learning Approaches for Building Cross-Language Dense Retrieval Models	382
<i>Suraj Nair, Eugene Yang, Dawn Lawrie, Kevin Duh, Paul McNamee, Kenton Murray, James Mayfield, and Douglas W. Oard</i>	
Evaluating the Robustness of Retrieval Pipelines with Query Variation Generators	397
<i>Gustavo Penha, Arthur Câmara, and Claudia Hauff</i>	
Exploiting Document-Based Features for Clarification in Conversational Search	413
<i>Ivan Sekulić, Mohammad Aliannejadi, and Fabio Crestani</i>	
Adversarial Multi-task Model for Emotion, Sentiment, and Sarcasm Aided Complaint Detection	428
<i>Apoorva Singh, Arousha Nazir, and Sriparna Saha</i>	
Joint Personalized Search and Recommendation with Hypergraph Convolutional Networks	443
<i>Thibaut Thonet, Jean-Michel Renders, Mario Choi, and Jinho Kim</i>	
Topic Aware Contextualized Embeddings for High Quality Phrase Extraction	457
<i>V. Venktesh, Mukesh Mohania, and Vikram Goyal</i>	
Topic Modeling on Podcast Short-Text Metadata	472
<i>Francisco B. Valero, Marion Baranes, and Elena V. Epure</i>	
Effective Rating Prediction Using an Attention-Based User Review Sentiment Model	487
<i>Xi Wang, Iadh Ounis, and Craig Macdonald</i>	
Goldilocks: Just-Right Tuning of BERT for Technology-Assisted Review	502
<i>Eugene Yang, Sean MacAvaney, David D. Lewis, and Ophir Frieder</i>	

Multi-modal Sentiment and Emotion Joint Analysis with a Deep Attentive Multi-task Learning Model	518
<i>Yazhou Zhang, Lu Rong, Xiang Li, and Rui Chen</i>	
Reproducibility Papers	
Do Lessons from Metric Learning Generalize to Image-Caption Retrieval?	535
<i>Maurits Bleeker and Maarten de Rijke</i>	
Consumer Fairness in Recommender Systems: Contextualizing Definitions and Mitigations	552
<i>Ludovico Boratto, Gianni Fenu, Mirko Marras, and Giacomo Medda</i>	
The Power of Anchor Text in the Neural Retrieval Era	567
<i>Maik Fröbe, Sebastian Günther, Maximilian Probst, Martin Potthast, and Matthias Hagen</i>	
Automation of Citation Screening for Systematic Literature Reviews Using Neural Networks: A Replicability Study	584
<i>Wojciech Kusa, Allan Hanbury, and Petr Knoth</i>	
Improving Query Representations for Dense Retrieval with Pseudo Relevance Feedback: A Reproducibility Study	599
<i>Hang Li, Shengyao Zhuang, Ahmed Mourad, Xueguang Ma, Jimmy Lin, and Guido Zuccon</i>	
Another Look at DPR: Reproduction of Training and Replication of Retrieval	613
<i>Xueguang Ma, Kai Sun, Ronak Pradeep, Minghan Li, and Jimmy Lin</i>	
Reproducing Personalised Session Search Over the AOL Query Log	627
<i>Sean MacAvaney, Craig Macdonald, and Iadh Ounis</i>	
Revisiting Popularity and Demographic Biases in Recommender Evaluation and Effectiveness	641
<i>Nicola Neophytou, Bhaskar Mitra, and Catherine Stinson</i>	
Squeezing Water from a Stone: A Bag of Tricks for Further Improving Cross-Encoder Effectiveness for Reranking	655
<i>Ronak Pradeep, Yuqi Liu, Xinyu Zhang, Yilin Li, Andrew Yates, and Jimmy Lin</i>	
An Evaluation Study of Generative Adversarial Networks for Collaborative Filtering	671
<i>Fernando Benjamín Pérez Maurera, Maurizio Ferrari Dacrema, and Paolo Cremonesi</i>	

Seed-Driven Document Ranking for Systematic Reviews: A Reproducibility Study	686
<i>Shuai Wang, Harrisen Scells, Ahmed Mourad, and Guido Zuccon</i>	
Author Index	701