

# **19th International Conference on Web Information Systems and Technologies (WEBIST 2023)**

Rome, Italy  
15 – 17 November 2023

**Editors:**

**Francisco García Peñalvo  
Massimo Marchiori**

ISBN: 978-1-7138-8651-8

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2023) by SCITEPRESS – Science and Technology Publications, Lda.  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2024)

For permission requests, please contact SCITEPRESS – Science and Technology Publications, Lda.  
at the address below.

SCITEPRESS – Science and Technology Publications, Lda.  
Avenida de S. Francisco Xavier, Lote 7 Cv. C,  
2900-616 Setúbal, Portugal

Phone: +351 265 520 185

Fax: +351 265520 186

[info@scitepress.org](mailto:info@scitepress.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# CONTENTS

---

## INVITED SPEAKERS

### KEYNOTE SPEAKERS

- Gpt-4 Versus Bert: Which Foundation Model Is More Suitable for Integrating Data from the Web? 5  
*Christian Bizer*
- Recommendation Systems in Scholarly Publishing 7  
*Yannis Manolopoulos*
- Capturing the Meaning of Industrial Data 9  
*Dimitris Kiritsis*

### PAPERS

#### FULL PAPERS

- Impact of Item Polarity on the Scales of the User Experience Questionnaire (UEQ) 15  
*Martin Schrepp, Jessica Kollmorgen and Jörg Thomaschewski*
- Who Says What (WSW): A Novel Model for Utterance-Aware Speaker Identification in Text-Based Multi-Party Conversations 26  
*Y. H. P. P. Priyadarshana, Zilu Liang and Ian Piumarta*
- Enhancing SSR in Low-Thread Web Servers: A Comprehensive Approach for Progressive Server-Side Rendering with any Asynchronous API and Multiple Data Models 37  
*Fernando Miguel Carvalho and Pedro Fialho*
- A Data Service Layer for Web Browser Extensions 49  
*Alex Tacuri, Sergio Firmenich, Gustavo Rossi and Alejandro Fernandez*
- Accessibility of e-Government Websites in Italy: The User Experience of People with Disabilities 59  
*Maria Claudia Buzzi, Marina Buzzi, Giuseppe Della Penna, Barbara Leporini and Francesca Ricci*
- Easy to Find: A Natural Language Query Processing System on Advertisements Using an Automatically Populated Database 71  
*Yiu-Kai Ng*
- FaceCounter: Massive Attendance Taking in Educational Institutions Through Facial Recognition 84  
*Adrian Moscol and Willy Ugarte*
- Paperless Checklist for Process Validation and Production Readiness: An Industrial Use Case 95  
*José Cosme, Tatiana Pinto, Anabela Ribeiro, Vítor Filipe, Eurico Vasco Amorim and Rui Pinto*
- PhotoRestorer: Restoration of Old or Damaged Portraits with Deep Learning 104  
*Christopher Mendoza-Dávila, David Porta-Montes and Willy Ugarte*
- Improved Random Key Cuckoo Search Optimization Algorithm for Community Detection in Social Networks 113  
*Randa Boukabene, Fatima Benbouzid-Si Tayeb and Narimene Dakiche*

Comparing the Energy Consumption of WebAssembly and JavaScript in Mobile Browsers <i>Dennis Pockstaller, Stefan Huber and Lukas Demetz</i>	121
Supporting the Automated Generation of Acceptance Tests of Process-Aware Information Systems <i>Tales M. Paiva, Toacy C. Oliveira, Raquel M. Pillat and Paulo S. C. Alencar</i>	128
Impacts of Social Factors in Wage Definitions <i>Arthur Rodrigues Soares de Quadros, Sarah Luiza de Souza Magalhães, Giulia Zanon de Castro, Jéssica Assunção da Almeida de Lima, Wladimir Cardoso Brandão and Alessandro Vieira</i>	140
Ontology-Driven Intelligent Group Pairing in Project-Based Collaborative Learning <i>Asma Hadyaoui and Lilia Cheniti-Belcadhi</i>	152
Documents as Intelligent Agents: An Approach to Optimize Document Representations in Semantic Search <i>Oliver Strauß and Holger Kett</i>	164
Quantifying Fairness Disparities in Graph-Based Neural Network Recommender Systems for Protected Groups <i>Nikzad Chizari, Keywan Tajfar, Niloufar Shoeibi and María N. Moreno-García</i>	176
<b>SHORT PAPERS</b>	
Compilation of Distributed Programs to Services Using Multiple Programming Languages <i>Thomas M. Prinz</i>	191
Is this a Good Book? The Role of Intrinsic and Extrinsic Cues for Perceived Product Quality in Textbooks in e-Commerce <i>Maria Madlberger and Ruslan Tagiev</i>	199
Java Binding for JSON-LD <i>Martin Ledvinka</i>	207
A Proposed Ontology-Based Sociocultural Context Model <i>Fatma-Zohra Rennane and Abdelkrim Meziane</i>	215
Implications of Edge Computing for Static Site Generation <i>Juho Vepsäläinen, Arto Hellas and Petri Vuorimaa</i>	223
The State of Disappearing Frameworks in 2023 <i>Juho Vepsäläinen, Arto Hellas and Petri Vuorimaa</i>	232
Students' Interests Related to Web and Mobile Technologies Study <i>Manuela Andreea Petrescu, Adrian Sterca and Ioan Badarinza</i>	242
Enhancing User Experience in e-Government: A Deep Dive into e-Government Forms and Citizen Perceptions <i>Asma Aldrees and Denis Gračanin</i>	250
Enhancing Soft Web Intelligence with User-Defined Fuzzy Aggregators <i>Paolo Fosci and Giuseppe Psaila</i>	258
Malicious Web Links Detection Using Ensemble Models <i>Claudia-Ioana Coste, Anca-Mirela Andreica and Camelia Chira</i>	268

New Perspectives on Data Exfiltration Detection for Advanced Persistent Threats Based on Ensemble Deep Learning Tree <i>Xiaojuan Cai and Hiroshi Koide</i>	276
Identifying Student Profiles in CSCL Systems for Programming Learning Using Quality in Use Analysis <i>Rafael Duque, Miguel Ángel Redondo, Manuel Ortega, Sergio Salomón and Ana Isabel Molina</i>	286
Investigating the Use of the Thinkable End-User Framework to Develop Haptic-Based Assistive Aids in the Orientation of Blind People <i>Alina Vozna, Giulio Galesi and Barbara Leporini</i>	294
DOM-Based Clustering Approach for Web Page Segmentation: A Comparative Study <i>Adrian Sterca, Oana Nourescu, Adriana Guran and Camelia Serban</i>	302
Access Control Using Facial Recognition with Neural Networks for Restricted Zones <i>Rodrigo Reaño, Piero Carrión and Juan-Pablo Mansilla</i>	310
Reconstruction and Validation of the UX Factor Trust for the User Experience Questionnaire Plus (UEQ+) <i>Andreas Hinderks, Martin Schrepp, Maria Rauschenberger and Jörg Thomaschewski</i>	319
There Are no Major Age Effects for UX Aspects of Voice User Interfaces Using the Kano Categorization <i>Jana Deutschländer, Anna C. Weigand, Andreas M. Klein, Dominique Winter and Maria Rauschenberger</i>	330
User-Centered Design and Iterative Refinement: Promoting Student Learning with an Interactive Dashboard <i>Gilbert Drzyzga and Thorleif Harder</i>	340
Data Exfiltration by Hotjar Revisited <i>Libor Polčák and Alexandra Slezáková</i>	347
Quality Metrics for Reinforcement Learning for Edge Cloud and Internet-of-Things Systems <i>Claus Pahl and Hamid R. Barzegar</i>	355
Apache Spark Based Deep Learning for Social Transaction Analysis <i>Raouf Jmal, Mariam Masmoudi, Ikram Amous, Corinne Amel Zayani and Florence Sèdes</i>	365
On the Construction of Database Interfaces Based on Large Language Models <i>João Pinheiro, Wendy Victorio, Eduardo Nascimento, Antony Seabra, Yenier Izquierdo, Grettel García, Gustavo Coelho, Melissa Lemos, Luiz Paes Leme, Antonio Furtado and Marco Casanova</i>	373
Enhancing Users' Interactions in Mobile Augmented Reality Systems Through Fuzzy Logic-Based Modelling of Computer Skills <i>Christos Troussas, Christos Papakostas and Cleo Sgouropoulou</i>	381
Pragmatic versus Hedonic: Determining the Dominant Quality in User Experience for Professional and Leisure Collaboration Tools <i>Lisa Eidloth, Anna-Lena Meiners, Jörg Thomaschewski and Andreas Hinderks</i>	391
Pleural Effusion Classification on Chest X-Ray Images with Contrastive Learning <i>Felipe André Zeiser, Ismael Garcia Santos, Henrique Christoph Bohn, Cristiano André da Costa, Gabriel de Oliveira Ramos, Rodrigo da Rosa Righi, Andreas Maier, José Rodrigo Mendes Andrade and Alexandre Bacelar</i>	399

A Stateless Bare PC Web Server <i>Fahad Alotaibi, Ramesh Karne and Alex Wijesinha</i>	406
A User Interface for Tuning QoS Parameters in Recommendation-Based Business Process Scenario Adaptation <i>Kiriakos Sgardelis, Dionisis Margaris, Dimitris Spiliotopoulos and Costas Vassilakis</i>	414
BSODCS: Bee Swarm Optimization for Detecting Community Structure <i>Narimene Dakiche</i>	422
SPORENLP: A Spatial Recommender System for Scientific Literature <i>Johannes Wirth, Daniel Roßner, René Peinl and Claus Atzenbeck</i>	429
Automatic Mapping of Business Web Applications <i>Adrian Sterca, Virginia Niculescu, Alexandru Kiraly and Darius Bufnea</i>	437
Tourpedia App: A Web Application for Tourists and Accommodation Owners <i>Angelica Lo Duca and Andrea Marchetti</i>	446
A Novel Hybrid Approach Combining Beam Search and DeepWalk for Community Detection in Social Networks <i>Aymene Berriche, Marwa Nair, Kamel Mohammed Yamani, Mehdi Zakaria Adjal, Sarra Bendaho, Nidhal Eddine Chenni, Fatima Benbouzid-Si Tayeb and Malika Bessedik</i>	454
Examining the Feasibility of Incorporating Social Media Platforms into Professional Training Programs <i>Malak Alharbi, Jennifer Warrender and Marie Devlin</i>	464
Enhancing Industrial Productivity Through AI-Driven Systematic Literature Reviews <i>Jaqueline Gutierrez Coelho, Guilherme Dantas Bispo, Guilherme Fay Vergara, Gabriela Mayumi Saiki, André Luiz Marques Serrano, Li Weigang, Clovis Neumann, Patricia Helena Martins, Welber Santos de Oliveira, Angela Brigida Albarello, Ricardo Accorsi Casonatto, Patrícia Missel, Roberto de Medeiros Junior, Jefferson de Oliveira Gomes, Carlos Rosano-Peña and Caroline Cabral F. da Costa</i>	472
The Impact of IOT Cybersecurity Testing in the Perspective of Industry 5.0 <i>Tauheed Waheed and Eda Marchetti</i>	480
Semantic Micro-Front-End Approach to Enterprise Knowledge Graph Applications Development <i>Milorad Tomic, Nenad Petrovic and Olivera Tomic</i>	488
Experimental Analysis of Pipelining Community Detection and Recommender Systems <i>Ryan Dutra de Abreu, Laura Silva de Assis and Douglas O. Cardoso</i>	496
Intelligent Agents with Graph Mining for Link Prediction over Neo4j <i>Michalis Nikolaou, Georgios Drakopoulos, Phivos Mylonas and Spyros Sioutas</i>	504
Towards a Framework for AI-Assisted Data Storytelling <i>Angelica Lo Duca</i>	512
Similarity Learning for Person Re-Identification Using Deep Auto-Encoder <i>Sevdenur Kutuk, Rayan Abri, Sara Abri and Salih Cetin</i>	520
WebAssembly and JavaScript Performance Analysis for Video Production Filters <i>Victor Vlad and Sabin Corneliu Buraga</i>	528

Decentralized Identification and Information Exchange in Distributed, Blockchain-Based Internet Architectures: A Technology Review <i>Laura Maria Marques da Fonseca, Hamid R. Barzegar and Claus Pahl</i>	535
A Decentralized Authentication Model for Internet of Vehicles Using SSI <i>Victor Emanuel F. C. Borges, Danilo F. S. Santos and Dalton C. G. Valadares</i>	545
<b>3RD INTERNATIONAL SPECIAL SESSION ON DATA MINING AND MACHINE LEARNING APPLICATIONS FOR CYBER SECURITY</b>	
<b>FULL PAPERS</b>	
Detecting the Manipulation of Text Structure in Text Steganography Using Machine Learning <i>Benjamin Aziz and Aysha Bukhelli</i>	557
An Attention-Based Deep Generative Model for Anomaly Detection in Industrial Control Systems <i>Mayra Macas, Chunming Wu and Walter Fuertes</i>	566
Cache Side-Channel Attacks Against Black-Box Image Processing Software <i>Ssuhung Yeh and Yuji Sekiya</i>	578
<b>SHORT PAPERS</b>	
GANMCMCRO: A Generative Adversarial Network Markov Chain Monte Carlo Random Oversampling Algorithm for Imbalance Datasets <i>Najmeh Abedzadeh and Matthew Jacobs</i>	587
Adapting Open-Set Recognition Method to Various Time-Series Data <i>András Halász, Lóránt Szabolcs Daubner, Nawar Al-Hemeary, János Juhász, Tamás Zsedrovits and Kálmán Tornai</i>	595
AUTHOR INDEX	603