# 17th International Conference on Web Information Systems and Technologies (WEBIST 2021)

Online
26 – 28 October 2021

## Editors:

**Francisco Dominguez Mayo**
**Massimo Marchiori**
**Joaquim Filipe**

ISBN: 978-1-7138-4008-4

**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© (2021) by SCITEPRESS – Science and Technology Publications, Lda.
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

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

**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
Web: www.proceedings.com

# CONTENTS


**INVITED SPEAKERS**

**KEYNOTE SPEAKERS**

Knowledge Graphs: Theory, Applications and Challenges 5
*Ian Horrocks*

Knowledge Graphs: Empower AI with Knowledge 7
*Dieter A. Fensel and Umutcan Şimşek*

From Ontology Engineering to Ontology Governance Models 9
*Oscar Corcho*

**PAPERS**

**FULL PAPERS**

The LeWiS Method: Target Variable Estimation using Cyber Security Intelligence 15
*Leigh Chase, Alaa Mohasseb and Benjamin Aziz*

A Teamwork Tool to Support Group Work in Online-based Higher Education: Exploring User Experience and the Use of Support Mechanisms by Students 27
*Jessica Brandenburger and Monique Janneck*

When owl:sameAs is the Same: Experimenting Online Resolution of Identity with SPARQL Queries to Linked Open Data Sources 41
*Raphaël Gazzotti and Fabien Gandon*

From Linked Data Querying to Visual Search: Towards a Visualization Pipeline for LOD Exploration 53
*Aline Menin, Catherine Faron, Olivier Corby, Carla Dal Sasso Freitas, Fabien Gandon and Marco Winckler*

Beyond Classical SERVICE Clause in Federated SPARQL Queries: Leveraging the Full Potential of URI Parameters 65
*Olivier Corby, Catherine Faron, Fabien Gandon, Damien Graux and Franck Michel*

*CONCORDIA*: COmputing semaNtic sentenCes for fRench Clinical Documents sImilArity 77
*Khadim Dramé, Gorgoumack Sambe and Gayo Diallo*

Memoryless: A Two-phase Methodology for Setting Memory Requirements on Serverless Applications 84
*Rodrigo da Rosa Righi, Gabriel Borges, Cristiano André da Costa and Vinicius Facco Rodrigues*

Impact of Tailored Network Splitting and Community Features' Change Rates on Prediction Accuracy in Dynamic Social Networks 95
*Narimene Dakiche, Karima Benatchba, Fatima Benbouzid-Si Tayeb and Yahya Slimani*

Commercial Sentiment Analysis Solutions: A Comparative Study 103
*Tatiana Ermakova, Max Henke and Benjamin Fabian*

A Comparison of Smart Grids Domain Ontologies 115
*José Miguel Blanco, Bruno Rossi and Tomáš Pitner*

Lbl2Vec: An Embedding-based Approach for Unsupervised Document Retrieval on Predefined Topics 124
*Tim Schopf, Daniel Braun and Florian Matthes*

A Framework for Staging Personal Health Trains in the Cloud
*Virginia Graciano Martinez, Luís Ferreira Pires, Luiz Olavo Bonino da Silva Santos,* 133
*João Luiz Rebelo Moreira and Renata Guizzardi-Silva Souza*

Simulated IoT Runtime with Virtual Smart Devices: Debugging and Testing End-user Automations 145
*Anthony Savidis, Yannis Valsamakis and Dimitris Linaritis*

Optimizing Resource Allocation in Edge-distributed Stream Processing
*Aluizio Rocha Neto, Thiago P. Silva, Thais V. Batista, Frederico Lopes, Flávia C. Delicato and* 156
*Paulo F. Pires*

Web Tool based on Machine Learning for the Early Diagnosis of ASD through the Analysis of the Subject's Gaze 167
*Sara Vecino, Martín Gonzalez-Rodriguez, Javier de Andres-Suarez and Daniel Fernandez-Lanvin*

A Scoring Map Algorithm for Automatically Detecting Structural Similarity of DOM Elements 174
*Julián Grigera, Juan Cruz Gardey, Alejandra Garrido and Gustavo Rossi*

Profiling Media Outlets and Audiences on Facebook: COVID-19 Coverage, Emotions and Controversy 186
*Luciana Oliveira and Joana Azevedo*

Perception and Adoption of Customer Service Chatbots among Millennials: An Empirical Validation in the Indian Context 197
*Himanshu Joshi*

Towards Services Profiling for Energy Management in Service-oriented Architectures
*Jorge Andrés Larracoechea, Philippe Roose, Sergio Ilarri, Yudith Cardinale, Sébastien Laborie and* 209
*Mauricio Jacobo González*

**SHORT PAPERS**

How Does the Indonesian Government Communicate Food Security during COVID-19 Pandemic: A Social Media Analysis on Indonesia Official Twitter Account 219
*Dimas Subekti, Eko Priyo Purnomo, Lubna Salsabila and Aqil Teguh Fathani*

Development and Performance Analysis of RESTful APIs in Core and Node.js using MongoDB Database 227
*Endrit Shkodra, Edmond Jajaga and Mehmet Shala*

Study on CPU and RAM Resource Consumption of Mobile Devices using Streaming Services 235
*Przemyslaw Falkowski-Gilski and Michal Wozniak*

Prediction Sentiment Polarity using Past Textual Content and CNN-LSTM Neural Networks 242
*Yassin Belhareth and Chiraz Latiri*

A Website with an Activity based Traffic Indicator System as a Warning Tool for the COVID-19 Pandemic 250
*Justin Junsay, Aaron Joaquin Lebumfacil, Ivan George Tarun and William Emmanuel Yu*

Opinion and Sentiment Analysis of Twitter Users during the 2021 Ecuador Presidential Election 257
*Jorge Parraga-Alava, Jorge Rodas-Silva, Iván Quimi and Roberth Alcivar-Cevallos*

GIMO-PD: Towards a Health Technology Proposal for Improving the Personalized Treatment of Parkinson's Disease Patients 267
*E. Enamorado-Díaz and J. A. García-García*

Working in a Smart Home-office: Exploring the Impacts on Productivity and Wellbeing 275
*Davit Marikyan, Savvas Papagiannidis, Rajiv Ranjan and Omer Rana*

Recommendation Recovery with Adaptive Filter for Recommender Systems 283
*José Miguel Blanco, Mouzhi Ge and Tomáš Pitner*

MENTORS: Monitoring Environment for System of Systems 291
*Antonello Calabrò, Said Daoudagh and Eda Marchetti*

Optimizing Sales Forecasting in e-Commerce with ARIMA and LSTM Models 299
*Konstantinos N. Vavliakis, Andreas Siailis and Andreas L. Symeonidis*

A Mixed Model for Identifying Fake News in Tweets from the 2020 U.S. Presidential Election 307
*Vítor Bernardes and Álvaro Figueira*

Text Analytics Can Predict Contract Fairness, Transparency and Applicability 316
*Nicola Assolini, Adelaide Baronchelli, Matteo Cristani, Luca Pasetto, Francesco Olivieri, Roberto Ricciuti and Claudio Tomazzoli*

Carsharing System for Urban Transport in Lima using Internet of Things 324
*Jean Pierre Vásquez-Garaya, Elizabeth Munayco-Apolaya and Willy Ugarte*

On the Integration of Shared Autonomous Mobility on Demand in Mobility Service Platforms 332
*Felix Schwinger, Ralf Philipsen, Simon Himmel, Matthias Jarke and Martina Ziefle*

ARKIVO Dataset: A Benchmark for Ontology-based Extraction Tools 341
*Laura Pandolfo and Luca Pulina*

Technological Model using Machine Learning Tools to Support Decision Making in the Diagnosis and Treatment of Pediatric Leukemia 346
*Daniel Mendoza-Vasquez, Stephany Salazar-Chavez and Willy Ugarte*

On Provisioning Procedural Geometry Workloads on Edge Architectures 354
*Ilir Murturi, Chao Jia, Bernhard Kerbl, Michael Wimmer, Schahram Dustdar and Christos Tsigkanos*

Which Is More Helpful in Finding Scientific Papers to Be Top-cited in the Future: Content or Citations? Case Analysis in the Field of Solar Cells 2009 360
*Masanao Ochi, Masanori Shiro, Jun'ichiro Mori and Ichiro Sakata*

A User-centric System for Improving Human-Computer Interaction through Fuzzy Logic-based Assistive Messages 365
*Christos Troussas, Akrivi Krouska and Cleo Sgouropoulou*

A Ridesharing Recommendation Framework with Hard and Soft Constraints 371
*Mow Fei Kim and Hamidah Ibrahim*

ProFog: A Proactive Elasticity Model for Fog Computing-based IoT Applications 380
*Guilherme Gabriel Barth, Rodrigo da Rosa Righi, Cristiano André da Costa and Vinicius Facco Rodrigues*

An Overview of Conversational Agent: Applications, Challenges and Future Directions 388
*Ahlam Alnefaie, Sonika Singh, Baki Kocaballi and Mukesh Prasad*

An Open-source Testbed for IoT Systems
*Augusto Ciuffoletti* 397

Harnessing Hypermedia MAS and Microservices to Deliver Web Scale Agent-based Simulations
*Rem Collier, Seán Russell and Fatemeh Golpayegani* 404

A Survey Study and Analysis of Task Scheduling Approaches for the Major Computing Environments
*Dalia Kamal A. A. Rizk, Hoda M. Hosny, El-Sayed M. El-Horbaty and Abdel-Badeeh M. Salem* 412

Towards a Smart Identification of Tax Default Risk with Machine Learning
*Vinicius Di Oliveira, Ricardo Matos Chaim, Li Weigang, Sergio Augusto Para Bittencourt Neto and Geraldo Pereira Rocha Filho* 422

Integrating Gamification: The Human-Centered Gamification Process
*Alischa Thomas, Frederik Bader, Jörg Thomaschewski and Maria Rauschenberger* 430

Predicting Stock Market Movements with Social Media and Machine Learning
*Paraskevas Koukaras, Vasiliki Tsichli and Christos Tjortjis* 436

Automatic Detection and Classification of Cognitive Distortions in Journaling Text
*Mai Mostafa, Alia El Bolock and Slim Abdennadher* 444

A RESTful Northbound Interface for Applications in Software Defined Networks
*Abdullah Alghamdi, David Paul and Edmund Sadgrove* 453

Collaborative Historical Platform for Historians: Extended Functionalities in Pauliceia 2.0
*Karla Donato Fook, Daniela Leal Musa, Nandamudi Vijaykumar, Rodrigo M. Mariano, Gabriel dos Reis Morais, Raphael Augusto O. Silva, Gabriel Sansigolo, Luciana Rebelo, Luís Antônio Coelho Ferla, Cintia Almeida, Luanna Nascimento, Vitória Martins Fontes da Silva, Monaliza Caetano dos Santos, Aracele Torres, Ângela Pereira, Fernando Atique, Jeffrey Lesser, Thomas D. Rogers, Andrew G. Britt, Rafael Laguardia, Ana Maria Alves Barbour, Orlando Guarnier Farias, Ariana Marco, Caróu Dickinson and Sand Tamires P. Camargo* 460

Integrating Agile Human-Centered Design with Lean UX and Scrum
*Jenny Pilz, Jana Deutschländer, Jörg Thomaschewski and Eva-Maria Schön* 467

Entity Linking of Sound Recordings and Compositions with Pre-trained Language Models
*Nikiforos Katakis and Pantelis Vikatos* 474

A Practical Experience Applying Security Audit Techniques in an Industrial e-Health System Which Uses an Open Source ERP
*Julián Gómez, Miguel Á. Olivero, J. A. García-García and María J. Escalona* 482

Real-time Recommendation System for Stock Investment Decisions
*Artur Bugaj and Weronika T. Adrian* 490

Set Expander: A Knowledge-based System for Entity Set Expansion
*Weronika T. Adrian and Paweł Caryk* 494

SCAN-NF: A CNN-based System for the Classification of Electronic Invoices through Short-text Product Description
*Diego Santos Kieckbusch, Geraldo P. R. Filho, Vinicius Di Oliveira and Li Weigang* 501

Anomaly Detection in Multivariate Spatial Time Series: A Ready-to-Use Implementation
*Chiara Bachechi, Federica Rollo, Laura Po and Fabio Quattrini* 509

Vulnerability Assessment of Angolan University Web Applications 518
*Emanuel Mateus and Carlos Serrão*

A Bi-recursive Auto-encoders for Learning Semantic Word Embedding 526
*Amal Bouraoui, Salma Jamoussi and Abdelmajid Ben Hamadou*

Experimental Evaluation of the Message Formats' Impact for Communication in Multi-party Edge Computing Applications 534
*Tarciso Braz de Oliveira Filho, Dalton Cézane Gomes Valadares, Thiago Fonseca Meneses, Adauto Ferreira de Barros, Aramis Sales Araujo and Danilo F. S. Santos*

A Model Driven Framework for the Development of Adaptable REST SERVICES 544
*Adil Kenzi and Fadoua Yakine*

Process Mining Analytics for Industry 4.0 with Graph Signal Processing 553
*Georgios Drakopoulos, Eleanna Kafeza, Phivos Mylonas and Spyros Sioutas*

**2ND INTERNATIONAL SPECIAL SESSION ON DATA MINING AND MACHINE LEARNING APPLICATIONS FOR CYBER SECURITY**

**FULL PAPER**

Asguard: Adaptive Self-guarded Honeypot 565
*Sereysethy Touch and Jean-Noël Colin*

**SHORT PAPERS**

Detecting Turkish Phishing Attack with Machine Learning Algorithm 577
*Melih Turhanlar and Cengiz Acartürk*

Hoplite Antivirus for Adversarial Attacks: A Theoretical Approach 585
*Anastasios Nikolakopoulos, Achilleas Marinakis, Vrettos Moulos and Theodora Varvarigou*

Federated Learning in Healthcare is the Future, But the Problems Are Contemporary 593
*Mustafa Y. Topaloglu, Elisabeth M. Morrell and Umit Topaloglu*

Modeling Credibility in Social Big Data using LSTM Neural Networks 599
*Athanasios Lyras, Sotiria Vernikou, Andreas Kanavos, Spyros Sioutas and Phivos Mylonas*

Implementation and Repeatability Aspects Combined with Refactoring for a Reviews Manager System 607
*Agorakis Bompotas, Aristidis Ilias, Andreas Kanavos, Panayiotis Kechagias, Panayiotis Arvanitakis, Nikos Zotos, Konstantinos Kovas and Christos Makris*

**SPECIAL SESSION ON QUALITY OF SERVICE AND QUALITY OF EXPERIENCE IN SYSTEMS AND SERVICES**

**FULL PAPERS**

Per-flow Packet Loss Ratios Induced by an Overflowed Buffer 621
*Andrzej Chydzinski and Blazej Adamczyk*

DOP and Pseudorange Error Estimation in Urban Environments for Mobile Android GNSS Applications 629
*Przemyslaw Falkowski-Gilski and Zbigniew Lubniewski*

**SHORT PAPERS**

Study on Speech Transmission under Varying QoS Parameters in a OFDM Communication System 641
*Monika Zamlynska, Przemyslaw Falkowski-Gilski, Grzegorz Debita and Bogdan Miedzinski*

Energy Efficiency Study of Audio-video Content Consumption on Selected Android Mobile Terminals 647
*Przemyslaw Falkowski-Gilski and Maciej Pankowski*

AUTHOR INDEX 659