

# **13th International Conference on Data Science, Technology and Applications (DATA 2024)**

Dijon, France  
9-11 July 2024

## **Editors:**

**Alfredo Cuzzocrea  
Elhadj Benkhelifa**

**Oleg Gusikhin  
Slimane Hammoudi**

ISBN: 979-8-3313-0548-2

**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© (2024) by SCITEPRESS – Science and Technology Publications, Lda.  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

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

- Towards a Responsible Thinking in the New Era of Gen AI: Walking the Walk  
*Mona Diab* 5
- Scalable Vector Analytics: A Story of Twists and Turns  
*Themis Palpanas* 7
- Past, Present, Future, and Far Future of AI  
*Jürgen Schmidhuber* 9

### PAPERS

#### FULL PAPERS

- Artificial Intelligence-Powered Large Language Transformer Models for Opioid Abuse and Social Determinants of Health Detection for the Underserved Population  
*Don Rooson, Yanting Wu, Jay Chok, Christopher P. Sanine, Tiffany Khou, Yawen Li and Hasiba M. Khan* 15
- Online Machine Learning for Adaptive Ballast Water Management  
*Nadeem Iftikhar, Yi-Chen Lin, Xiufeng Liu and Finn Ebertsen Nordbjerg* 27
- Efficient and Secure Multiparty Querying over Federated Graph Databases  
*Nouf Aljuaid, Alexei Lisitsa and Sven Schewe* 39
- Reputation, Sentiment, Time Series and Prediction  
*Peter Mitic* 51
- A Cascade of Consequences: Improving an Accident Analysis Method by Learning from a Real Life Telecommunications Accident  
*Hans C. A. Wienen, Faiza A. Bukhsh, Eelco Vriezolk and Luís Ferreira Pires* 62
- Is Positive Sentiment Missing in Corporate Reputation?  
*Peter Mitic* 71
- A Deep Dive into GPT-4's Data Mining Capabilities for Free-Text Spine Radiology Reports  
*Kludia Szabó Ledenyi, András Kicsi and László Vidács* 82
- Privacy-Preserving Big Hierarchical Data Analytics via Co-Occurrence Analysis  
*Alfredo Cuzzocrea and Selim Soufargi* 93
- Risk-Stratified Multi-Objective Resource Allocation for Optimal Aviation Security  
*Eva K. Lee, Taylor J. Leonard and Jerry C. Booker* 104
- Cross-Lingual Low-Resources Speech Emotion Recognition with Domain Adaptive Transfer Learning  
*Imen Baklouti, Olfa Ben Ahmed and Christine Fernandez-Maloigne* 118
- HTC-GEN: A Generative LLM-Based Approach to Handle Data Scarcity in Hierarchical Text Classification  
*Carmelo Fabio Longo, Misael Mongiovi, Luana Bulla and Giusy Giulia Tuccari* 129

Course Recommendation System for Company Job Placement Using Collaborative Filtering and Hybrid Model <i>Jaeheon Park, Suan Lee, Woncheol Lee and Jinho Kim</i>	139
Intelligent Sampling System for Connected Vehicle Big Data <i>Omar Makke, Syam Chand, Vamsee Krishna Batchu, Oleg Gusikhin and Vicky Svidenko</i>	150
An Exploratory Analysis of Malaria and Climatic Factors in India <i>Sachin Yadav Bodke and Usha Ananthakumar</i>	159
Intelligent Transportation Systems: A Survey on Data Engineering <i>Safa Batita, Achraf Makni and Ikram Amous</i>	169
Expert Agent Guided Learning with Transformers and Knowledge Graphs <i>Chukwuka Victor Obionwu, Bhavya Baburaj Chovatta Valappil, Minu Genty, Maria Jomy, Visakh Padmanabhan, Aishwarya Suresh, Sumat Singh Bedi, David Broneske and Gunter Saake</i>	180
A Max Flow Min Cut View of Social Media Posts <i>James Abello, Timothy R. Tangherlini and Haoyang Zhang</i>	190
<b>SHORT PAPERS</b>	
Brain Stroke Prediction Using Visual Geometry Group Model <i>V. Narayanan, A. Reddy, V. Venkatesh, S. Tutun, P. Norouzzadeh, E. Snir, S. Mahmoud and B. Rahmani</i>	205
Stochastic Simulation Agent for Unknown Inventory Demands in Healthcare Supply Management <i>Rafael Marin Machado de Souza, Leandro Nunes de Castro, Marcio Biczysk, Marcos dos Santos and Eder Costa Cassettari</i>	211
Dynamic Price Prediction for Revenue Management System in Hospitality Sector <i>Susanna Saitta, Vito D'Amico and Giovanni Maria Farinella</i>	218
An Effective Prediction of Events in Social Networks Using Influence Score of Communities <i>B. S. A. S. Rajita, Yaganti Bhanu Vikas, Prithish Prashant Moharir, Deepa Kumari and Subhrakanta Panda</i>	229
Logical Rule Set to Data Acquisition and Database Semantics <i>Susumu Yamasaki and Mariko Sasakura</i>	237
A Data-Driven Approach for Predictive Maintenance of Impellers in Flexible Impeller Pumps Using Prophet <i>Efe Can Demir and Sencer Sultanoğlu</i>	245
Objective Evaluation of Sleep Disturbances in Older Adults with Cognitive Impairment Using a Bed Sensor System and Self-Organizing Map Analysis <i>Tomoko Kamimura, Risa Otsuka, Asaka Domoto, Hikofumi Suzuki and Mamino Tokita</i>	253
BeRTo: An Efficient Spark-Based Tool for Linking Business Registries in Big Data Environments <i>Andrea Colombo and Francesco Invernici</i>	259
Recommendations of Research Articles by Experts: Visualizing Relationships and Expertise <i>Peiling Wang, Scott Shumate, Pinghao Ye and Chad Mitchell</i>	269
Data-Driven Model Categorization: Advancing Physical Systems Analysis Through Graph Neural Networks <i>Andrija Grbavac, Martin Angerbauer, Michael Grill and André Casal Kulzer</i>	277

Students' Performance in Learning Management System: An Approach to Key Attributes Identification and Predictive Algorithm Design <i>Dynil Duch, Madeth May and Sébastien George</i>	285
Dataset Balancing in Disease Prediction <i>Vincenza Carchiolo and Michele Malgeri</i>	293
A Comparison of the Efficiencies of Various Structured and Semi- Structured Data Formats in Data Analysis and Big Data Analytic Development <i>Heather E. Graham and Taoxin Peng</i>	301
Forgetting in Knowledge Graph Based Recommender Systems <i>Xu Wang and Christopher Brewster</i>	309
Towards Computational Performance Engineering for Unsupervised Concept Drift Detection: Complexities, Benchmarking, Performance Analysis <i>Elias Werner, Nishant Kumar, Matthias Lieber, Sunna Torge, Stefan Gumhold and Wolfgang E. Nagel</i>	318
Influential Factors on Drivetrain Consumption in Electric City Buses and Assessing the Optimization Potentials <i>Sunilkumar Raghuraman, Daniel Baumann, Marc Schindewolf and Eric Sax</i>	330
Yet Another Miner Utility Unveiling a Dataset: CodeGrain <i>Dániel Horváth and László Vidács</i>	338
Use of Semantic Artefacts in Agricultural Data-Driven Service Development <i>Silke Cuno and Philipp Lämmel</i>	346
Study of Impact of Gender on Engagement and Performance of Engineering Students <i>M. E. Sousa-Vieira, J. C. López-Ardao and M. Fernández-Veiga</i>	358
Random Neural Network Ensemble for Very High Dimensional Datasets <i>Jesus S. Aguilar-Ruiz and Matteo Fratini</i>	368
Federated Road Surface Anomaly Detection Using Smartphone Accelerometer Data <i>Oussama Mazari Abdessameud and Walid Cherifi</i>	376
A Comparative Study on the Impact of Categorical Encoding on Black Box Model Interpretability <i>Hajar Hakkoum and Ali Idri</i>	384
Comparative Analysis of Hate Speech Detection Models on Brazilian Portuguese Data: Modified BERT vs. BERT vs. Standard Machine Learning Algorithms <i>Thiago Mei Chu, Leila Weitzel and Paulo Quaresma</i>	392
Real-Time Equipment Health Monitoring Using Unsupervised Learning Techniques <i>Nadeem Iftikhar and Finn Ebertsen Nordbjerg</i>	401
Machine Learning Classification in Cardiology: A Systematic Mapping Study <i>Khadija Anejjar, Fatima Azzahra Amazal and Ali Idri</i>	409
Impact of Satellites Streaks for Observational Astronomy: A Study on Data Captured During One Year from Luxembourg Greater Region <i>Olivier Parisot and Mahmoud Jaziri</i>	417
Strategic Placement of Data Centers for Economic Analysis: An Online Algorithm Approach <i>Christine Markarian and Claude Fachkha</i>	425

Discretization Strategies for Improved Health State Labeling in Multivariable Predictive Maintenance Systems <i>Jean-Victor Autran, Véronique Kuhn, Jean-Philippe Diguët, Matthias Dubois and Cédric Buche</i>	434
Failure Prediction Using Multimodal Classification of PCB Images <i>Pedro M. Goncalves, Miguel A. Brito and Jose Guilherme Cruz Moreira</i>	442
A Few-Shot Learning-Focused Survey on Recent Named Entity Recognition and Relation Classification Models <i>Sakher Khalil Alqaaidi, Elika Bozorgi, Afsaneh Shams and Krzysztof J. Kochut</i>	450
It is Time to Develop an Auditing Framework to Promote Value Aware Chatbots <i>Yanchen Wang and Lisa Singh</i>	460
Towards FAIR Data Workflows for Multidisciplinary Science: Ongoing Endeavors and Future Perspectives in Plasma Technology <i>Robert Wagner, Dagmar Waltemath, Kristina Yordanova and Markus M. Becker</i>	471
A Web-Based Hate Speech Detection System for Dialectal Arabic <i>Anis Charfi, Andria Atalla, Raghda Akasheh, Mabrouka Bessghaier and Wajdi Zaghouani</i>	478
Interoperable Open Data Platforms: A Prototype for Sharing CKAN Data Sources <i>Sebastian Becker and Marcel Altendeitering</i>	486
Twitter Metrical Data Analysis Using R: Twiplomacy in the Outbreak of the War in Ukraine <i>Dimitrios Vagianos and Thomas Papatsas</i>	494
Anomaly Detection in Industrial Production Products Using OPC-UA and Deep Learning <i>Henry O. Velesaca, Doménica Carrasco, Dario Carpio, Juan A. Holgado-Terriza, Jose M. Gutierrez-Guerrero, Tonny Toscano and Angel D. Sappa</i>	505
Prediction of Academic Success in a University and Improvement Using Lean Tools <i>Kléber Sánchez and Diego Vallejo-Huanga</i>	513
Machine Learning for KPI Development in Public Administration <i>Simona Fioretto, Elio Masciari and Enea Vincenzo Napolitano</i>	522
Visualization and Interpretation of Mel-Frequency Cepstral Coefficients for UAV Drone Audio Data <i>Mia Y. Wang, Zhiwei Chu, Conner Entzinger, Yi Ding and Qian Zhang</i>	528
Spatial and Spatio-Temporal Modelling of Auto Insurance Claim Frequencies During Pre-and Post-COVID-19 Pandemic <i>Jin Zhang, Shengkun Xie, Anna T. Lawniczak and Clare Chua-Chow</i>	535
Towards Semantic Data Management Plans for Efficient Review Processing and Automation <i>Jana Martínková and Marek Suchánek</i>	543
Integration and Optimization of XNAT-Based Platforms for the Management of Heterogeneous and Multicenter Data in Biomedical Research <i>Camilla Scapicchio, Silvia Arezzini, Maria Evelina Fantacci, Antonino Formuso, Aafke Christine Kraan, Enrico Mazzoni, Sara Saponaro, Maria Irene Tenerani and Alessandra Retico</i>	551
Design Features for Data Trustee Selection in Data Spaces <i>Michael Steinert, Daniel Tebernum and Marius Hupperz</i>	559

Visualizing OWL and RDF: Advancing Ontology Representation for Enhanced Semantic Clarity and Communication <i>Giulia Biagioni</i>	571
Navigating the AI Timeline: From 1995 to Today <i>Vincenza Carchiolo and Michele Malgeri</i>	577
Random Forest Classification of Cognitive Impairment Using Digital Tree Drawing Test (dTDT) Data <i>Sebastian Unger, Zafer Bayram, Laura Anderle and Thomas Ostermann</i>	585
Presence of Corporate Reputation Cues in Company Vacancy Texts Boosts Vacancy Attractiveness as Perceived by Employees <i>R. E. Loke and F. Betten</i>	593
AUTHOR INDEX	605