

# **15th International Conference on Agents and Artificial Intelligence (ICAART 2023)**

Volume 2

Lisbon, Portugal  
22-24 February 2023

**Editors:**

**Ana Paula Rocha  
Luc Steels  
Jaap van den Herik**

ISBN: 978-1-7138-7657-1

**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. (2023)

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

Quantum Annealing for Constraint Satisfaction and Constrained Optimization <i>Philippe Codognet</i>	5
AI and Music with Knowledge Graphs <i>Valentina Presutti</i>	7
MarIA: Spanish Language Models <i>Marta Villegas</i>	9
Outracing Champion Gran Turismo Drivers with Deep Reinforcement Learning <i>Michael Spranger</i>	11

### ARTIFICIAL INTELLIGENCE

#### FULL PAPERS

Deep W-Networks: Solving Multi-Objective Optimisation Problems with Deep Reinforcement Learning <i>Jernej Hribar, Luke Hackett and Ivana Dusparic</i>	17
First Go, then Post-Explore: The Benefits of Post-Exploration in Intrinsic Motivation <i>Zhao Yang, Thomas M. Moerland, Mike Preuss and Aske Plaat</i>	27
Reinforcement Learning Explained via Reinforcement Learning: Towards Explainable Policies through Predictive Explanation <i>Léo Saulières, Martin C. Cooper and Florence Bannay</i>	35
Adding Time and Subject Line Features to the Donor Journey <i>Greg Lee, Ajith Kumar Raghavan and Mark Hobbs</i>	45
Identifying Visitor's Paintings Appreciation for AI Audio Guide in Museums <i>Mari Saito, Takato Okudo, Makoto Yamada and Seiji Yamada</i>	55
Deep Learning Model Selection With Parametric Complexity Control <i>Olga Grebenkova, Oleg Bakhteev and Vadim Strijov</i>	65
Innovations and Emerging Technologies: A Study of the Italian Intellectual Property Knowledge Database <i>Annamaria Demarinis Loiotile, Francesco De Nicolò, Alfonso Monaco, Sabina Tangaro, Shiva Loccisano, Giuseppe Conti, Adriana Agrimi, Nicola Amoroso and Roberto Bellotti</i>	75
Towards a Foundation for Intelligent Contracts <i>Georgios Stathis, Athanasios Trantas, Giulia Biagioni, Jaap van den Herik, Bart Custers, Laura Daniele and Theofilos Katsigiannis</i>	87
Generation of Facial Images Reflecting Speaker Attributes and Emotions Based on Voice Input <i>Kotaro Koseki, Yuichi Sei, Yasuyuki Tahara and Akihiko Ohsuga</i>	99

Coverage-Guided Fuzzing for Plan-Based Robotics <i>Tim Meywerk, Vladimir Herdt and Rolf Drechsler</i>	106
Data Augmentation Through Expert-Guided Symmetry Detection to Improve Performance in Offline Reinforcement Learning <i>Giorgio Angelotti, Nicolas Drougard and Caroline P. C. Chanel</i>	115
A New Dynamic Community-Based Recommender System <i>Sabrina Ben Abdrabbah, Nahla Ben Amor and Raouia Ayachi</i>	125
Trade-off Clustering Approach for Multivariate Multi-Step Ahead Time-Series Forecasting <i>Konstandinos Aiwanseido, Wafa Badreddine and Jérôme Bosche</i>	137
Rewiring Knowledge Graphs by Graph Neural Network Link Predictions <i>Alex Romanova</i>	149
Interactive Video Saliency Prediction: The Stacked-convLSTM Approach <i>N. Wondimu, U. Visser and C. Buche</i>	157
LSTM, ConvLSTM, MDN-RNN and GridLSTM Memory-based Deep Reinforcement Learning <i>Fernando Fradique Duarte, Nuno Lau, Artur Pereira and Luís Paulo Reis</i>	169
Predicting Off-Block Delays: A Case Study at Paris - Charles de Gaulle International Airport <i>Thibault Falque, Bertrand Mazure and Karim Tabia</i>	180
Using NLP to Enrich Scientific Knowledge Graphs: A Case Study to Find Similar Papers <i>Xavier Quevedo and Janneth Chicaiza</i>	190
Quantum Reinforcement Learning for Solving a Stochastic Frozen Lake Environment and the Impact of Quantum Architecture Choices <i>Theodora-Augustina Drăgan, Maureen Monnet, Christian B. Mendl and Jeanette M. Lorenz</i>	199
Qualitative Spatial Representation and Reasoning About Fold Strata <i>Yuta Taniuchi and Kazuko Takahashi</i>	211
Automatic Facility Layout Design System Using Deep Reinforcement Learning <i>Hikaru Ikeda, Hiroyuki Nakagawa and Tatsuhiro Tsuchiya</i>	221
Partner Selection Strategy in Open, Dynamic and Sociable Environments <i>Qin Liang, Wen Gu, Shohei Kato, Fenghui Ren, Guoxin Su, Takayuki Ito and Minjie Zhang</i>	231
Multi-Label Learning for Aspect Category Detection of Arabic Hotel Reviews Using AraBERT <i>Asma Ameer, Sana Hamdi and Sadok Ben Yahia</i>	241
Improving Convergence for Quantum Variational Classifiers Using Weight Re-Mapping <i>Michael Kölle, Alessandro Giovagnoli, Jonas Stein, Maximilian Balthasar Mansky, Julian Hager and Claudia Linnhoff-Popien</i>	251
Exotic Bets: Evolutionary Computing Coupled with Bet Mechanisms for Model Selection <i>Simon Reichhuber and Sven Tomforde</i>	259
An Application of Priority-Based Lightweight Ontology Merging <i>Rim Mohamed, Truong-Thanh Ma and Zied Bouraoui</i>	268
A Fine-Tuning Aggregation Convolutional Neural Network Surrogate Model of Strategy Selecting Mechanism for Repeated-Encounter Bilateral Automated Negotiation <i>Shengbo Chang and Katsuhide Fujita</i>	277

Deep Hybrid Bagging Ensembles for Classifying Histopathological Breast Cancer Images <i>Fatima-Zahrae Nakach, Ali Idri and Hasnae Zerouaoui</i>	289
EMTE: An Enhanced Medical Terms Extractor Using Pattern Matching Rules <i>Monah Bou Hatoum, Jean-Claude Charr, Christophe Guyeux, David Laiymani and Alia Ghaddar</i>	301
An Audit Framework for Technical Assessment of Binary Classifiers <i>Debarati Bhaumik and Diptish Dey</i>	312
A Robust Adaptive Workload Orchestration in Pure Edge Computing <i>Zahra Safavifar, Charafeddine Mechalik and Fatemeh Golpayegani</i>	325
InsectDSOT: A Neural Network for Insect Detection in Olive Trees <i>Lotfi Souifi, Afef Mdhaffar, Ismael Bouassida Rodriguez, Mohamed Jmaiel and Bernd Freisleben</i>	334
An Ontology-Based Augmented Observation for Decision-Making in Partially Observable Environments <i>Saeedeh Ghanadbashi, Akram Zarchini and Fatemeh Golpayegani</i>	343
Studying Narrative Economics by Adding Continuous-Time Opinion Dynamics to an Agent-Based Model of Co-Evolutionary Adaptive Financial Markets <i>Arwa Bokhari and Dave Cliff</i>	355
Quantitative Performance Analysis from Discrete Perspective: A Case Study of Chip Detection in Turning Process <i>Sharmin Sultana Sheuly, Mobyen Uddin Ahmed and Shahina Begum</i>	368
Farsighter: Efficient Multi-Step Exploration for Deep Reinforcement Learning <i>Yongshuai Liu and Xin Liu</i>	380
Interpretable Machine Learning for Modelling and Explaining Car Drivers' Behaviour: An Exploratory Analysis on Heterogeneous Data <i>Mir Riyanul Islam, Mobyen Uddin Ahmed and Shahina Begum</i>	392
On Converting Logic Programs Into Matrices <i>Tuan Nguyen Quoc and Katsumi Inoue</i>	405
JoVe-FL: A Joint-Embedding Vertical Federated Learning Framework <i>Maria Hartmann, Grégoire Danoy, Mohammed Alswaitti and Pascal Bouvry</i>	416
Latent Code Disentanglement Using Orthogonal Latent Codes and Inter-Domain Signal Transformation <i>Babak Solhjoo and Emanuele Rodolà</i>	427
Generation-Based Data Augmentation Pipeline for Real-Time Automatic Gesture Recognition <i>Mingxi Cheng, Fatima Zohra Daha, Amit Srivastava and Ji Li</i>	437
GaSUM: A Genetic Algorithm Wrapped BERT for Text Summarization <i>Imen Tanfourri and Fethi Jarray</i>	447
Brain Tumor Segmentation of Lower-Grade Glioma Across MRI Images Using Hybrid Convolutional Neural Networks <i>Amal Jlassi, Khaoula ElBedoui and Walid Barhoumi</i>	454
MRNN: A Multi-Resolution Neural Network with Duplex Attention for Deep Ad-Hoc Retrieval <i>Tolgahan Cakaloglu, Xiaowei Xu and Roshith Raghavan</i>	466

CSP-DC: Data Cleaning via Constraint Satisfaction Problem Solving <i>Nibel Nadjeh, Sabrina Abdellaoui and Fahima Nader</i>	478
Integrating Unsupervised Clustering and Label-Specific Oversampling to Tackle Imbalanced Multi-Label Data <i>Payel Sadhukhan, Arjun Pakrashi, Sarbani Palit and Brian Mac Namee</i>	489
Analysing Customer Behaviour Using Simulated Transactional Data <i>Ryan Butler and Edwin Simpson</i>	499
AUTHOR INDEX	511