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Computational Collective Intelligence


14th International Conference, ICCCI 2022
Hammamet, Tunisia, September 28–30, 2022
Proceedings

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Preface

This volume contains the first part of the proceedings of the 14th International Conference on Computational Collective Intelligence (ICCCI 2022), held in Hammamet, Tunisia, during 28–30 September, 2022. Due to the COVID-19 pandemic, the conference was organized in a hybrid mode which allowed for both on-site and online paper presentations. The conference was hosted by the French SIGAPP Chapter (ACM Special Interest Group on Applied Computing), France, and organized by Wrocław University of Science and Technology, Poland, in cooperation with the IEEE SMC Technical Committee on Computational Collective Intelligence, the European Research Center for Information Systems (ERCIS), the Université de Pau et des Pays de l'Adour, France, the Université de Jendouba, Tunisia, and the International University, VNU-HCM, Vietnam.

Following the successes of the previous conferences held in Wrocław, Poland (2009), Kaohsiung, Taiwan (2010), Gdynia, Poland (2011), Ho Chi Minh City, Vietnam (2012), Craiova, Romania (2013), Seoul, South Korea (2014), Madrid, Spain (2015), Halkidiki, Greece (2016), Nicosia, Cyprus (2017), Bristol, UK (2018), Hendaye, France (2019), Da Nang, Vietnam (2020), and Rhodes, Greece (2021), this conference continued to provide an internationally respected forum for scientific research in the computer-based methods of collective intelligence and their applications.

Computational collective intelligence (CCI) is most often understood as a subfield of artificial intelligence (AI) dealing with soft computing methods that facilitate group decisions or processing knowledge among autonomous units acting in distributed environments. Methodological, theoretical, and practical aspects of CCI are considered as the form of intelligence that emerges from the collaboration and competition of many individuals (artificial and/or natural). The application of multiple computational intelligence technologies such as fuzzy systems, evolutionary computation, neural systems, consensus theory, etc., can support human and other collective intelligence, and create new forms of CCI in natural and/or artificial systems. Three subfields of the application of computational intelligence technologies to support various forms of collective intelligence are of special interest but are not exclusive: the Semantic Web (as an advanced tool for increasing collective intelligence), social network analysis (as a field targeted at the emergence of new forms of CCI), and multi-agent systems (as a computational and modeling paradigm especially tailored to capture the nature of CCI emergence in populations of autonomous individuals).

The ICCCI 2022 conference featured a number of keynote talks and oral presentations, closely aligned to the theme of the conference. The conference attracted a substantial number of researchers and practitioners from all over the world, who submitted their papers for the main track and 11 special sessions.

The main track, covering the methodology and applications of CCI, included knowledge engineering and the Semantic Web, recommender systems, collective decision-making, data mining and machine learning, computer vision techniques, and natural language processing, as well as the Internet of Things (IoT) technologies and applications. The special sessions, covering some specific topics of particular interest, included cooperative strategies for decision making and optimization, optimization approaches of production systems in Industries 4.0 and 5.0, collective intelligence in medical applications, IoT, deep learning and natural language processing, computational collective intelligence, computational intelligence for multimedia understanding, machine learning for social data analytics, malware analytics in smart environment, big text mining searching, and artificial intelligence.

We received over 420 papers submitted by authors coming from 46 countries around the world. Each paper was reviewed by at least three members of the international Program Committee (PC) of either the main track or one of the special sessions. Finally, we selected 66 papers for oral presentation and publication in one volume of the Lecture Notes in Artificial Intelligence series and 58 papers for oral presentation and publication in one volume of the Communications in Computer and Information Science series.

We would like to express our thanks to the keynote speakers: Grigorios Tsoumakas from the Aristotle University of Thessaloniki, Greece; Sören Auer, Director and Head of the research group Data Science and Digital Libraries at the TIB – Leibniz Information Centre for Science and Technology and University Library, Germany; Jahna Otterbacher from the Open University of Cyprus and CYENS Centre of Excellence, Cyprus; and Grzegorz J. Nalepa from Jagiellonian University, Poland, for their world-class plenary speeches.

Many people contributed toward the success of the conference. First, we would like to recognize the work of the PC co-chairs and special sessions organizers for taking good care of the organization of the reviewing process, an essential stage in ensuring the high quality of the accepted papers. The workshop and special session chairs deserve a special mention for the evaluation of the proposals and the organization and coordination of 11 special sessions. In addition, we would like to thank the PC members, of the main track and of the special sessions, for performing their reviewing work with diligence. We thank the Local Organizing Committee chairs, publicity chair, Web chair, and technical support chair for their fantastic work before and during the conference. Finally, we cordially thank all the authors, presenters, and delegates for their valuable contributions to this successful event. The conference would not have been possible without their support.

Our special thanks are also due to Springer for publishing the proceedings and to all the other sponsors for their kind support.

It is our pleasure to announce that the ICCCI conference series continues to have a close cooperation with the Springer journal Transactions on Computational Collective Intelligence and the IEEE SMC Technical Committee on Transactions on Computational Collective Intelligence.

Finally, we hope that ICCCI 2022 contributed significantly to the academic excellence of the field and will lead to the even greater success of ICCCI events in the future.

September 2022

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Contents

Collective Intelligence and Collective Decision-Making

Inferring Event Causality in Films via Common Knowledge Corpora	3
<i>Ben Aidlin, Armin Shmilovici, and Mark Last</i>	

Cooperation Game on Communication Multigraph with Fuzzy Parameters	16
<i>Barbara Gładysz and Jacek Mercik</i>	

Impact of Similarity Measure on the Quality of Communities Detected in Social Network by Hierarchical Clustering	29
<i>Paweł Szyman and Dariusz Barbucha</i>	

An Approach to Modeling a Real-Time Updated Environment Based on Messages from Agents	43
<i>Marek Krótkiewicz, Krystian Wojtkiewicz, Marcin Jodłowiec, Rafał Palak, Mikołaj Szczerbicki, and Piotr Nawrocki</i>	

Updating the Result Ontology Integration at the Concept Level in the Event of the Evolution of Their Components	51
<i>Adrianna Kozierkiewicz, Marcin Pietranik, Mateusz Olsztyński, and Loan T. T. Nguyen</i>	

Integrating Machine Learning into Learner Profiling for Adaptive and Gamified Learning System	65
<i>Souha Bennani, Ahmed Maalel, Henda Ben Ghezala, and Achref Daouahi</i>	

Deep Learning Techniques

A New Deep Learning Fusion Approach for Emotion Recognition Based on Face and Text	75
<i>Nouha Khediri, Mohammed Ben Ammar, and Monji Kherallah</i>	

Cycle Route Signs Detection Using Deep Learning	82
<i>Lukas Kopecky, Michal Dobrovolny, Antonin Fuchs, Ali Selamat, and Ondrej Krejcar</i>	

Data Augmentation for Morphological Analysis of Histopathological Images Using Deep Learning	95
<i>Martin Tabakov, Konrad Karanowski, Adam R. Chlopowiec, Adrian B. Chlopowiec, and Mikołaj Kasperek</i>	

An End-to-End Framework for Evaluating Explainable Deep Models: Application to Historical Document Image Segmentation	106
<i>Iheb Brini, Maroua Mehri, Rolf Ingold, and Najoua Essoukri Ben Amara</i>	
Deep Convolutional Neural Network for Arabic Speech Recognition	120
<i>Rafik Amari, Zouhaira Noubigh, Salah Zrigui, Dhaou Berchech, Henri Nicolas, and Mounir Zrigui</i>	
RingNet: Geometric Deep Representation Learning for 3D Multi-domain Protein Shape Retrieval	135
<i>Hela Haj Mohamed, Samir Belaid, and Wady Naanaa</i>	
Patch Selection for Melanoma Classification	148
<i>Guillaume Lachaud, Patricia Conde-Cespedes, and Maria Trocan</i>	
Natural Language Processing	
Multi-model Analysis of Language-Agnostic Sentiment Classification on MultiEmo Data	163
<i>Piotr Miłkowski, Marcin Gruza, Przemysław Kazienko, Joanna Szolomicka, Stanisław Woźniak, and Jan Kocoń</i>	
Sentiment Analysis of Tunisian Users on Social Networks: Overcoming the Challenge of Multilingual Comments in the Tunisian Dialect	176
<i>Samawel Jaballi, Salah Zrigui, Mohamed Ali Sghaier, Dhaou Berchech, and Mounir Zrigui</i>	
Non-Contextual vs Contextual Word Embeddings in Multiword Expressions Detection	193
<i>Maciej Piasecki and Kamil Kanclerz</i>	
Context-free Transformer-based Generative Lemmatiser for Polish	207
<i>Wiktor Walentynowicz, Maciej Piasecki, and Artur Kot</i>	
French Object Clitics in the Interlanguage: A Linguistic Description and a Formal Analysis in the ACCG Framework	220
<i>Amina Affes, Ismaïl Biskri, and Adel Jebali</i>	
Contradiction Detection Approach Based on Semantic Relations and Evidence of Uncertainty	232
<i>Ala Eddine Kharrat, Lobna Hlaoua, and Lotfi Ben Romdhane</i>	
C-DESERT Score for Arabic Text Summary Evaluation	246
<i>Samira Ellouze, Maher Jaoua, and Arem Atoui</i>	

Data Mining and Machine Learning

Proficiency Level Classification of Foreign Language Learners Using Machine Learning Algorithms and Multilingual Models	261
<i>Bogumila Hnatkowska and Damian Wawrzyniak</i>	
Simulation System for Producing Real World Dataset to Predict the Covid-19 Contamination Process*	272
<i>Bokri Ahmed and Naouali Sami</i>	
Design and Compression Study for Convolutional Neural Networks Based on Evolutionary Optimization for Thoracic X-Ray Image Classification	283
<i>Hassen Louati, Ali Louati, Slim Bechikh, and Lamjed Ben Said</i>	
TF-MOPNAS: Training-free Multi-objective Pruning-Based Neural Architecture Search	297
<i>Quan Minh Phan and Ngoc Hoang Luong</i>	
Efficient Pneumonia Detection Method and Implementation in Chest X-ray Images Based on a Neuromorphic Spiking Neural Network	311
<i>Tomohide Fukuchi, Mark Ikechukwu Ogbodo, Jiangkun Wang, Khanh N. Dang, and Abderazek Ben Abdallah</i>	
Oversampling for Mining Imbalanced Datasets: Taxonomy and Performance Evaluation	322
<i>Piotr Jędrzejowicz</i>	
A Block Coordinate DCA Approach for Large-Scale Kernel SVM	334
<i>Van Tuan Pham, Hoang Phuc Hau Luu, and Hoai An Le Thi</i>	

Knowledge Engineering and Semantic Web

Hybrid Approach to Designating Ontology Attribute Semantics	351
<i>Bogumila Hnatkowska, Adrianna Kozierkiewicz, Marcin Pietranik, and Hai Bang Truong</i>	
A New Approach of Morphological Analysis of Arabic Syntagmatic Units Based on a Linguistic Ontology	364
<i>Mariam El Abdi, Boutheina Smine Ben Ali, and Sadok Ben Yahia</i>	
Collinear Data Structures and Interaction Models	378
<i>Leon Bobrowski</i>	
Competency Management Model for a Team of Trainers	388
<i>Jarosław Wikarek and Paweł Sitek</i>	

Querying and Reasoning in Paraconsistent Rule-Object Languages
with Inheritance Expressions 396
Andrzej Szalas

Fundamental Formal Language 410
Marek Krótkiewicz

Computer Vision Techniques

Deep Learning for Robust Information Retrieval System 425
*Achref Ouni, Eric Royer, Thierry Chateau, Marc Chevaldonné,
and Michel Dhome*

A New CBIR Model Using Semantic Segmentation and Fast Spatial
Binary Encoding 437
*Achref Ouni, Thierry Chateau, Eric Royer, Marc Chevaldonné,
and Michel Dhome*

Temporal Segmentation of Basketball Continuous Videos Based
on the Analysis of the Camera and Player Movements 450
Kazimierz Choroś

Hybrid UNET Model Segmentation for an Early Breast Cancer Detection
Using Ultrasound Images 464
Ikram Ben Ahmed, Wael Ouarda, and Chokri Ben Amar

Multiple-criteria-Based Object Pose Tracking in RGB Videos 477
Mateusz Majcher and Bogdan Kwolek

Beyond the Visible Spectrum: Is Person Identity Well Preserved
in Thermal Cameras? 491
*Afef Ben Said, Hajer Fradi, Dorra Lamouchi,
and Mohamed Amine Marnissi*

Social Networks and Intelligent Systems

TunTap: A Tunisian Dataset for Topic and Polarity Extraction in Social
Media 507
Mohamed Amine Djebbi and Riadh Ouersighni

An Adaptive Social Network Model for Expatriate Integration Based
on Bonding by Homophily and Interaction Connects 520
Kamiel Gülpen, Dante de Lang, and Jan Treur

A Reinforcement Learning and Transformers Based Intelligent System for the Support of Alzheimer's Patients in Daily Life Activities	534
<i>Ahmed Snoun, Tahani Bouchrika, and Olfa Jemai</i>	
Multi-task Learning Dataset for the Development of Remote Patient Monitoring System	548
<i>Firas Khilil, Sami Naouali, Awatef Raddadi, Sameh Ben Salem, Hedi Gharsallah, and Chihebeddine Romdhani</i>	
Developing a Student Monitoring System for Online Classrooms Based on Face Recognition Approaches	555
<i>Trong-Nghia Pham, Nam-Phong Nguyen, Nguyen-Minh-Quan Dinh, and Thanh Le</i>	
Cybersecurity and Internet of Things	
Towards a Webshell Detection Approach Using Rule-Based and Deep HTTP Traffic Analysis	571
<i>Ha V. Le, Hoang V. Vo, Tu N. Nguyen, Hoa N. Nguyen, and Hung T. Du</i>	
Security Consideration of BIA Utilization in Smart Electricity Metering Systems	585
<i>Vladimir Sobeslav, Josef Horalek, Tomas Svoboda, and Hana Svecova</i>	
Towards Optimizing Malware Detection: An Approach Based on Generative Adversarial Networks and Transformers	598
<i>Ayyub Alzahem, Wadii Boulila, Maha Driss, Anis Koubaa, and Iman Almomani</i>	
An XGBoost-Based Approach for an Efficient RPL Routing Attack Detection	611
<i>Faicel Yaakoubi, Aymen Yahyaoui, Wadii Boulila, and Rabah Attia</i>	
An Automatic Refinement for Event-B Through Annotated Temporal Logic Patterns	624
<i>Badr Siala and Mohamed T. Bhiri</i>	
Xtend Transformation from PDDL to Event-B	638
<i>Farah Fourati, Mohamed Tahar Bhiri, and Riadh Robbana</i>	

Cooperative Strategies for Decision Making and Optimization

An Integrated Artificial Bee Colony Algorithm for Scheduling Jobs
and Flexible Maintenance with Learning and Deteriorating Effects 647
*Nesrine Touafek, Fatima Benbouzid-Si Tayeb, Asma Ladj,
Alaeddine Dahamni, and Riyadh Baghdadi*

Chaotic Dingo Optimization Algorithm: Application in Feature Selection
for Beamforming Aided Spectrum Sensing 660
*Sarra Ben Chaabane, Kais Bouallegue, Akram Belazi,
Sofiane Kharbech, and Ammar Bouallegue*

Multi-start Tabu Agents-Based Model for the Dual-Resource Constrained
Flexible Job Shop Scheduling Problem 674
Farah Farjallah, Housseem Eddine Nouri, and Olfa Belkahla Driss

Segment Based Approach to Travelling Salesman Problem 687
Andrzej Siemiński

A Second-Order Adaptive Network Model for Organizational Learning
and Usage of Mental Models for a Team of Match Officials 701
*Sam Kuilboer, Wesley Sieraad, Gülay Canbaloğlu, Laila van Ments,
and Jan Treur*

Computational Intelligence for Digital Content Understanding

Speech Representation Using Linear Chirplet Transform and Its
Application in Speaker-Related Recognition 719
Hao D. Do, Duc T. Chau, and Son T. Tran

Towards Making University PDFs Conform to Universal Accessibility
Standard 730
Marek Kopel

Table Recognition in Scanned Documents 744
Takwa Kazdar, Marwa Jmal, Wided Souidene, and Rabah Attia

TT-ViT: Vision Transformer Compression Using Tensor-Train
Decomposition 755
Hoang Pham Minh, Nguyen Nguyen Xuan, and Son Tran Thai

Medical Prescription Recognition Using Heuristic Clustering
and Similarity Search 768
*Ngoc-Thao Nguyen, Hieu Vo, Khanh Tran, Duy Ha, Duc Nguyen,
and Thanh Le*

Employing the Google Search and Google Translate to Increase the Performance of the Credibility Detection in Arabic Tweets	781
<i>Rabeaa Mouty and Achraf Gazdar</i>	

Applications for Industry 4.0

RF-Based Mini-Drone Detection, Identification & Jamming in No Fly Zones Using Software Defined Radio	791
<i>Feten Slimeni, Tijeni Delleji, and Zied Chtourou</i>	

A New 3D-Regular Shaped Geometry-Based MIMO Channel Model for Vehicle-to-Vehicle Communications in Rectangular Tunnel	799
<i>Jalel Chebil, Hanene Zormati, Ali Mansour, Ismail Ben Mabrouk, and Jamel Bel Hadj Tahar</i>	

Avoiding Hazardous Color Combinations in Traffic Signs on STN Based Model for Autonomous Vehicles	809
<i>Sagdat Okimbek, Nurlan Razak, Iskander Akhmetov, and Alexandr Pak</i>	

Feasibility of RSS Measurements for Smartphone-Based Indoor Acoustic Localization	823
<i>Veronika Hromadova, Peter Brida, Roman Jarina, and Juraj Machaj</i>	

Cognitive Load Measurement Using Arithmetic and Graphical Tasks and Galvanic Skin Response	836
<i>Patient Zihisire Muke, Zbigniew Telec, and Bogdan Trawiński</i>	

Author Index	851
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