



Final Technical Program

December 10, 2022

22nd International Conference on
Intelligent Systems Design and Applications (ISDA'22)

22nd International Conference on
Hybrid Intelligent Systems (HIS'22)

18th International Conference on
Information Assurance and Security (IAS'22)

14th International Conference on
Soft Computing and Pattern Recognition (SoCPaR'22)

14th World Congress on
Nature and Biologically Inspired Computing (NaBIC'22)

13th International Conference on
Innovations in Bio-Inspired Computing and Applications (IBICA'22)

12th World Congress on
Information and Communication Technologies (WICT'22)

December 12-16, 2022

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Online Program Overview (All times are listed in GMT – Please check your local time zones)

| Event | December | Time (GMT) |
|---|----------|---------------|
| Conference Opening Ceremony | 12 | 08:30 - 09:00 |
| Plenary Talk 1: Patrik Christen, Institute for Information Systems, Switzerland <i>Title: Biology-Inspired and Philosophy-Guided Modelling of Complex Systems</i> | 12 | 09:00 - 10:00 |
| ISDA: AILSIA 2022 (Parallel Session) | 12 | 10:00 - 13:00 |
| ISDA: Session 1 (Parallel Session) | 12 | 10:00 - 13:00 |
| ISDA: Session 2 (Parallel Session) | 12 | 13:00 - 15:00 |
| ISDA: Session 3 (Parallel Session) | 12 | 13:00 - 15:00 |
| ISDA: Session 4 | 12 | 15:00 - 17:00 |
| ISDA: Session 5 (Parallel Session) | 13 | 08:00 - 09:00 |
| ISDA: Session 6 (Parallel Session) | 13 | 08:00 - 09:00 |
| Plenary Talk 2: Maki Sakamoto, The University of Electro-Communications, Tokyo, Japan <i>Title: Computer Vision for Expressing Texture Using Sound-Symbolic Words</i> | 13 | 09:00 - 10:00 |
| ISDA: Session 7 (Parallel Session) | 13 | 10:00 - 13:00 |
| ISDA: Session 8 (Parallel Session) | 13 | 10:00 - 13:00 |
| Plenary Talk 3: Catarina Silva, University of Coimbra, Portugal <i>Title: Interpretability and Explainability in Intelligent Systems</i> | 13 | 13:00 - 14:00 |
| Plenary Talk 4: Joanna Kolodziej, National Research Institute, Poland <i>Title: Security, reliability and trust in cloud digital service chains – GUARD platform</i> | 13 | 14:00 - 15:00 |
| ISDA: Session 9 & HIS: Session 1 (Parallel Session) | 13 | 15:00 - 17:00 |
| HIS: Session 2 (Parallel Session) | 13 | 15:00 - 17:30 |
| Plenary Talk 5: Katherine Malan, University of South Africa <i>Title: Landscape analysis of optimisation and machine learning search space</i> | 14 | 09:00 - 10:00 |
| Plenary Talk 6: Mário Antunes, Polytechnic Institute of Leiria, Portugal <i>Title: Cybersecurity: the road ahead</i> | 14 | 10:00 - 11:00 |
| HIS: Session 3 (Parallel Session) | 14 | 11:00 - 13:00 |
| HIS: Session 4 (Parallel Session) | 14 | 11:00 - 13:00 |
| HIS: Session 5 (Parallel Session) | 14 | 13:00 - 15:00 |
| IAS: Session 1 (Parallel Session) | 14 | 13:00 - 16:00 |
| Plenary Talk 7: Kaspar Riesen, University of Bern, Switzerland <i>Title: Four Decades of Structural Pattern Recognition – An Overview of the Three Major Epochs</i> | 15 | 09:00 - 10:00 |
| Plenary Talk 8: Kaisa Miettinen, University of Jyväskylä, Finland <i>Title: Some Perspectives to Interactive Evolutionary Multiobjective Optimization Methods</i> | 15 | 10:00 - 11:00 |
| SoCPaR: Session 1 (Parallel Session) | 15 | 11:00 - 13:00 |
| SoCPaR: Session 2 (Parallel Session) | 15 | 11:00 - 13:00 |
| NaBIC: Session 1 (Parallel Session) | 15 | 13:00 - 16:00 |
| IBICA: Session 1 (Parallel Session) | 15 | 13:00 - 16:00 |
| IBICA: Session 2 (Parallel Session) | 15 | 16:00 - 17:30 |

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|---|----|---------------|
| IBICA: Session 3 (Parallel Session) | 15 | 16:00 - 17:30 |
| Plenary Talk 9: Yifei Pu, Sichuan University, China <i>Title: Analog Circuit Implementation of Fractional-Order Memristor: Arbitrary-Order Lattice Scaling Fracmemristor</i> | 16 | 09:00 - 10:00 |
| WICT: Session 1 | 16 | 10:00 - 12:30 |
| WICT: Session 2 | 16 | 12:30 - 15:00 |
| Plenary Talk 10: Patricia Melin, Tijuana Institute of Technology, Mexico <i>Hybrid Intelligent Systems based on Neural Networks, Fuzzy Logic and Bioinspired Optimization Algorithms and their application to Pattern Recognition</i> | 16 | 15:00 -16:00 |
| Conference Closing Ceremony | | 16:00 |

Offline Paper Presentation Schedule (All times are listed in GMT)

| Event | December | Time (GMT) |
|---------------------------------|-----------------|-------------------|
| ISDA Offline Session 1 | 12 | 09:00 - 13:00 |
| ISDA Offline Session 2 | 12 | 13:00 - 17:00 |
| ISDA Offline Session 3 | 13 | 09:00 - 13:00 |
| ISDA Offline Session 4 | 13 | 13:00 - 17:00 |
| HIS Offline Session 1 | 14 | 09:00 - 13:00 |
| HIS Offline Session 2 | 14 | 13:00 - 17:00 |
| IAS Offline Session 1 | 15 | 09:00 - 11:00 |
| SoCPaR Offline Session 1 | 15 | 11:00 - 17:00 |
| NaBIC Offline Session 1 | 16 | 09:00 - 10:00 |
| IBICA Offline Session 1 | 16 | 10:00 - 13:00 |
| WICT Offline Session 1 | 16 | 13:00 - 15:00 |



December 12, 2022 - Monday

08:30 - 09:00 GMT: Conference Opening Session

09:00 – 10:00 GMT

Plenary 1: Patrik Christen, FHNW, Institute for Information Systems, Olten, Switzerland

Title: Biology-Inspired and Philosophy-Guided Modelling of Complex Systems

Chair: Thomas Hanne, University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

December 12, 2022 - Monday

10:00 - 13:00 GMT

ISDA 2022: AILSIA 2022

Chairs: Alexey Kornaev and Ramil Kuleev

- 7 Khushboo Jain, Manali Gupta, Surabhi Patel and Ajith Abraham
Object classification using ECOC Multi-Class SVM and HOG characteristics
- 9 Khushboo Jain, Arun Agarwal, Ashima Jain and Ajith Abraham
A Multi-layer Deep Learning Model for ECG-Based Arrhythmia Classification
- 112 Shreya Biswas, Anu Bajaj and Ajith Abraham
Multi-Level Image Segmentation Using Kapur Entropy Based Dragonfly Algorithm
- 145 Ajesh F and Ajith Abraham
Age Related Macular Degeneration Using Deep Neural Network and PSO: A Methodology Approach
- 191 Vitaly Romanov and Vladimir Ivanov
Assessing the Importance of Global Relationships for Source Code Analysis Using Graph Neural Networks
- 210 Elena Kornaeva, Alexey Kornaev, Alexander Fetisov, Ivan Stebakov and Leonid Savin
U-Net as a tool for adjusting the velocity distributions of rheomagnetic fluids
- 215 Adyasha Sahu, Pradeep Das, Sukadev Meher, Rutuparna Panda and Ajith Abraham
An Efficient Deep Learning-based Breast Cancer Detection Scheme with Small Datasets
- 220 Alexander Fetisov, Yuri Kazakov, Leonid Savin and Denis Shutin
Synthesis of a DQN-based controller for improving performance of rotor system with tribotronic magnetorheological bearing
- 223 Yuri Kazakov, Ivan Stebakov, Alexander Fetisov, Alexey Kornaev and Roman Polyakov
Methods for improving the fault diagnosis accuracy of rotating machines
- 244 Surendiran B, Dileep Kumar, Amutha S and Arulmurugaselvi N
Euler Transformation Axis method for Online Virtual Trail Room Using Fusion of Images

- 253 Shreya Biswas, Anu Bajaj and Ajith Abraham
Multi-Level Image Segmentation of Breast tumors Using Kapur Entropy Based Nature-Inspired Algorithms
- 255 Albina Khusainova
Sampling Imbalanced Data for Multilingual Machine Translation: an Overview of Techniques
- 257 Elif Cesur, Muhammet Raşit Cesur and Ajith Abraham
Digital Twin-based Fuel Consumption Model of Locomotive Diesel Engine
- 258 Arunkumar Akkineni, Somayeh Koohborfardhaghghi and Shailesh Singh
Centrality of AI Quality in MLOPs Lifecycle and its Impact on the Adoption of AI/ML Solutions
- 271 Alexey Rodichev, Andrey Gorin, Kirill Nastepanin and Roman Polyakov
Intelligent diagnostic system for the sliding bearing unit

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December 12, 2022 - Monday

10:00 - 13:00 GMT

ISDA 2022: Session 1 (Parallel Session)

Chairs: Nuno Bettencourt, Devi Priya

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- 6 Vihaan Nama, Gerard Deepak and Santhana Vijayan Arumugam
KCReqRec: A Knowledge Centric Approach for Semantically Inclined Requirement Recommendation with Micro Requirement Mapping using Hybrid Learning Models
- 10 Paulo Rogerio Nietto, Maria do Carmo Nicoletti and Nilton Cesar Sacco
Analyzing Electoral Data Using Partitional and Hierarchical Clustering Algorithms
- 14 S M Vadivel, Sooraj Sanjai, Siri S and A H Sequeira
India Post service facility layout design selection and evaluation using MCDM approach
- 17 Vadivel S M, A H Sequeira and Sunil Kumar Jauhar
Indian Postal Service Quality Assessment using Graph Theoretic approach – A quantitative decision-making tool
- 18 Vadivel S M, Buvanesh Chandrasekaran, Thangaraja Arumugam, Sivakumar K and Uduak Umoh
Analyzing the Critical Success Factors of lean system implementation in India Post using DEMATEL method
- 23 Vadivel S M, A H Sequeira, Deeksha Sanjay Shetty and Chandana V
Application of WASPAS method for the evaluation of Tamil Nadu private travels
- 30 Sakine Akyol, Onur Dogan and Orhan Er
Process Automation with Digital Robots Under Smart University Concept
- 31 Vadivel S M, A H Sequeira, Vimal Kumar and Chandana V
Performance evaluation of manufacturing product layout design using PROMETHEE II MCDM method
- 32 Vadivel S M, A H Sequeira, Uduak Umoh and Chandana V
An ergonomics assessment manual sorting operations in postal service industry using EDAS method
- 37 Bhawesh Kumar Chaudhary, Sanjay Agrawal, Pranaba Kumar Mishro and Rutuparna Panda
An Error Sensitive Fuzzy Clustering Technique for Mammogram Image Segmentation
- 38 Vadivel S M, Deeksha Sanjay Shetty, A H Sequeira, Nagaraj E and Sakthivel V
A sustainable green supplier selection using CRITIC method
- 39 Vadivel S M, Suganya Palanivelu, A H Sequeira and Chandana V
Apartment waste disposal sustainable facility location using ENTROPY method
- 42 Vadivel S M, Pranamya B, Arivazhagan P, A H Sequeira and Chandana V
Application of VIKOR method for green postal sustainable service design
- 48 Rogelio González, María Beatriz Bernábe, Erika Granillo and Guillermo De Ita
Territorial Design and Travel Salesman Problem Applied to the Population Census as a case study
- 49 Chunfu Xie
A Unified Framework for Knowledge Inference Based on Heterogeneous Graph Neural Network

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December 12, 2022 - Monday

13:00 - 15:00 GMT

ISDA 2022: Session 2 (Parallel Session)

Chairs: K. Suneetha, Mahendra Kanojia

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- 50 Baptiste Nguyen, Pierre-Alain Moellic and Sylvain Blayac
Evaluation of Convolution Primitives for Embedded Neural Networks on 32-bit Microcontrollers
- 52 Mamta Arora, Mrinal Pandey, Varun Prakash, Sagar Raghav and Shubham Sood
Stack Tag - Predicting the Stack Overflow Questions' Tags using Gated Recurrent Unit Networks
- 60 Jyothi V K and Guda Ramachandra Kaladhara Sarma
A combinatorial approach: Datamining and an efficient Deep neural network for Heart disease prediction
- 63 Martin Verrev
Evaluation of Semantic Parsing Frameworks for Automated Knowledge Base Construction
- 67 Zhanjun Tan, Qasim Khadim, Aki Mikkola and Xiao-Zhi Gao
Parameters Optimization in Hydraulically Driven Machines Using Swarm Intelligence
- 75 Pooja Verma and Daya Sagar Gupta
SP2P-MAKA: Smart Contract based Secure P2P Mutual Authentication Key Agreement Protocol for Intelligent Energy System
- 76 Abdessamad Saidi, Mohamed Hadj Kacem, Imen Tounsi and Ahmed Hadj Kacem
Automated Transformation of IoT Systems Models into Event-B Specifications
- 77 Walid Ben Fradj and Mohamed Turki
Prediction of business process execution time
- 81 Chiao-Yun Li, Sebastiaan van Zelst and Wil van der Aalst
A Framework for Automated Abstraction Class Detection for Event Abstraction
- 89 Disha Wankhede and Chetan Shelke
An Investigative approach on the prediction of Isocitrate dehydrogenase (idh1) mutations and co-deletion of 1p19q in glioma brain tumors

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December 12, 2022 - Monday

13:00 - 15:00 GMT

ISDA 2022: Session 3 (Parallel Session)

Chairs: Susana Nicola, Oluwasegun Julius Aroba

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- 91 Uthayakumaran Uthayarakavan, Kamalanathan Thakshayini, Sivakumar Krushi Yadushika, Ananthasiri Gowthaman and Rubaa Panchendrarajan
CoCoSL: Agricultural Solutions using Image Processing for Coconut Farms in Sri Lanka
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CIWPR: A Strategic Framework for Collective Intelligence Encompassment for Web Page Recommendation
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Implementation analysis for the applications of warehouse model under linear integer problems
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Inventiveness of Text Extraction with Inspiration of Cloud Computing and ML using Python Logic
- 98 Sahar Dammak, Hazar Mliki, Emna Fendri and Amal Selmi
An improved GAN-based method for Low Resolution Face Recognition
- 103 Madhuri Karnik and Dattadraya Kodavade
A Survey on Controllable Abstractive Text Summarization
- 109 Kavya Ramisetty, Shatakshi Gupta, Jabez Christopher and Subhrakanta Panda
Explainable Decision Making Model by Interpreting Classification Algorithms
- 111 Intissar Hilali, Nouha Arfaoui and Ridha Ejbali
Tourist trajectory DataWarehouse: Event Time of Interest, Region of Interest and Place of Interest
- 113 Jeya Mala D and Pradeep Reynold A
Prediction Analytics of Hyperledger Blockchain Data in B2B Finance Applications
- 116 Yuvaraj Natarajan, Sripreethaa Kr, Gitanjali Wadhwa, Mathivathani Natarajan and Lekshmi Priya Saravanan
Enhanced road damage detection for smart city surveillance

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December 12, 2022 - Monday

15:00 - 17:00 GMT

ISDA 2022: Session 4

Chairs: Pallavi Khatri, Victor Fedoseev

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- 117 Yuvaraj Natarajan, Karthikeyan B, Gitanjali Wadhwa, Srinivasan Saaradha Annadurai and Parthiv Akilesh Appavu Sivakumar
A Deep Learning based Natural Language Processing Approach for detecting SQL injection Attack
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ML Classifier using Multiple Neural Networks Trained by Linear Programming
- 120 Fatma Bouhleb, Hazar Mliki, Rayen Lagha and Mohamed Hammami
TIR-GAN: Thermal Images Restoration using Generative Adversarial Network
- 122 Nesrine Chaibi and Mourad Zaied
A multi-level wavelet decomposition network for Image Super Resolution
- 125 Karima Gouasmia, Wafa Meftah and Faiez Gargouri
Machine Learning For Complex Data Analysis
- 126 Shivani Student, Sudhir Chauhan, Renu Tuli and Nidhi Sindhwani
Enhanced Zero Suffix Method for Multi-objective Bulk Transportation Problem
- 127 Indra Jaganathan, Kiruba Shankar Rameshbabu and Devipriya R
Speech Emotion Recognition Using Support vector Machine and Linear Discriminant Analysis
- 128 Nourane Kallel, Hazar Mliki, Ahmed Amine Ghorbel and Achraf Bouketteya
Human Activity Recognition in a Thermal Spectrum for an Intelligent Video Surveillance Application
- 131 Nissrine Bensouda, Sanaa El Fkihi and Rdouan Faizi
Extracting the Distinctive Features of Opinion Spams using Logistic Regression
- 134 Ramya Sree and Mohan Kumar
A Comparative Analysis Of Prediction Of Brain Stroke Using AIML

December 13, 2022 - Tuesday

December 13, 2022 - Tuesday

08:00- 09:00 GMT

ISDA 2022: Session 5 (Parallel Session)

Chairs: Somayeh Koohborfardhaghighi, K. Anitha Kumari

- 136 Ameni Chetouane, Kamel Karoui and Ghayth Nemri
Machine Learning Method for DDoS Detection and Mitigation in a Multi-Controller SDN Environment using Cloud Computing
- 137 Aruna A S, Remesh Babu K R and Deepthi K
A Survey of Recent Techniques in Computational Drug Repurposing
- 139 Salwa Ajel, Francisco Ribeiro, Ridha Ejbali and João Saraiva
Energy Efficiency of Python Machine Learning Frameworks
- 142 Nripendra Kumar Singh and Khalid Raza
Detection of Treatment Types in Dental Panoramic X-Rays Using Deep Learning
- 53 Yuvaraj D and Anandh K. S.
A Rapid Review on the Application of Unmanned Aerial Vehicles in Construction Safety

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December 13, 2022 - Tuesday
08:00- 09:00 GMT
ISDA 2022: Session 6 (Parallel Session)
Chairs: André Santos, Mamta Arora

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- 83 Zohra Alyani and Mohamed Turki
An MDA approach for extending functional dimension for sensitive business processes execution
- 96 Anitha Kumari K, Sangeetha S, Rajeevan V, Deva Dharshini M and Haritha T
Trade Management System using R3 Corda Blockchain
- 147 Luis Balderas Ruiz, Miguel Lastra Leidinger, Antonio Láinez-Ramos Bossini and José Manuel Benítez Sánchez
COVID-ViT: COVID-19 detection method based on Vision Transformers
- 150 Nesrine Affes, Jalel Ktari, Nader Ben Amor, Tarek Frikha and Habib Hamam
Real time detection and tracking in multi speakers video conferencing
- 152 Najet Elkhailil, Youssouf Cheikh Weddy and Ridha Ejbali
Image Compression-encryption scheme based on SPIHT coding and 2D Beta Chaotic Map
- =====

December 13, 2022 - Tuesday
09:00 – 10:00 GMT
Plenary 2: Maki Sakamoto, The University of Electro-Communications, Tokyo, Japan
Title: Computer Vision for Expressing Texture Using Sound-Symbolic Words
Chair: Tzung-Pei Hong, National University of Kaohsiung, Taiwan

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December 13, 2022 - Tuesday

10:00- 13:00 GMT

ISDA 2022: Session 7 (Parallel Session)

Chairs: Sebastián Basterrech, Devi Priya

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- 154 Monika Singh, Pardeep Singh and Satish Chand
Skeleton-based Human Activity Recognition using Bidirectional LSTM
- 155 Widad Hassina Belkadi, Yassine Drias and Habiba Drias
A Data Warehouse for spatial soil data analysis and mining: Application to the Maghreb region
- 156 Mohamed Hedi Elhajje, Nouha Arfaoui, Salwa Said and Ridha Ejbali
A New Approach For The Design of Medical Image ETL Using CNN
- 158 Sebastián Basterrech, Jan Platos, Gerardo Rubino and Michal Wozniak
Experimental analysis on dissimilarity metrics and sudden concept drift detection
- 160 Awais Shaikh, Mahendra Kanojia and Keshav Mishra
Emotion detection based on facial expression using YOLOv5
- 161 Keshav Mishra, Mahendra Kanojia and Awais Shaikh
LSTM based model for Sanskrit to English Translation
- 162 Sali Mohammad Issa, Qinmu Peng and Haitham Issa
Alzheimer Disease Investigation in Resting-State fMRI Images Using Local Coherence Measure
- 168 Meher Phanideep D, Subhashini N, Mani Kumar Reddy V, Bahirithi Karampudi and Muthulakshmi S
Malware analysis using Machine Learning
- 171 Muhammad Pervez Akhter, Muhammad Atif Bilal and Saleem Riaz
Content-based Long Text Documents Classification using Bayesian Approach for a Resource-poor Language Urdu
- 175 Iryna Talamanova and Sabri Pillana
Data-driven Real-time Short-term Prediction of Air Quality: Comparison of ES, ARIMA, and LSTM
- 176 Jesper Jakobsen, Mikkel Jessen, Iman Sharifirad and Jalil Boudjadar
A Flexible Implementation Model for Neural Networks on FPGAs
- 178 Kamal Bouhassoune, Sam Goundar and Abdelkrim Haqiq
Blockchain for smart healthcare: a SWOT analysis from the patient perspective
- 211 Wiem Kbaier and Sonia Ayachi Ghannouchi
Detection of Similarity between Business Process Models With the integration of Semantics in Similarity Measures
- 214 Devi Priya R, Boggala Thulasi Reddy and Hariharan P
Efficient Twitter Sentiment Analysis System Using Deep Learning Algorithm

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December 13, 2022 - Tuesday

10:00- 13:00 GMT

ISDA 2022: Session 8 (Parallel Session)

Chairs: Nuno Bettencourt, Pranaba K. Mishro

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- 187 Gabriella Casalino, Giovanna Castellano and Gianluca Zaza
Explainable fuzzy models for Learning Analytics
- 194 Saravanan C, Anish Samantaray and John Sahaya Rani Alex
Multimodal Analysis of Parkinson's Disease Using Machine Learning Algorithms
- 202 Vijayakumar P and Omamageswari M
Gated Recurrent Unit and Long short-term memory based Hybrid Intrusion Detection System
- 205 Banu Priya Prathaban, Suresh Kumar R and Jenath M
IoT Based Early Flood Detection and Avoidance System
- 208 Rani Pacharane, Mahendra Kanojia and Keshav Mishra
Machine Learning Approach For Detection Of Mental Health
- 221 Marouane Ait Said and Abdelmajid Hajami
Card-not-present fraud detection: Merchant category code prediction of the next purchase
- 225 Salwa Abdelwahed and Haifa Touati
LSTM-based Congestion Detection in Named Data Networks
- 227 Mariem Gnouma, Ridha Ejbali and Mourad Zaied
Abnormal event detection method based on spatiotemporal CNN hashing model
- 233 José Crispim, Andreia Martins and Nazaré Rego
Risk Management in the Clinical Pathology Laboratory: a Bayesian Network approach
- 234 Pietro Dell'Oglio, Alessandro Bondielli, Alessio Bechini and Francesco Marcelloni
Leveraging pattern mining for robot process automation
- 236 Baqar Rizvi, David Attew and Mohsen Farid
Unsupervised Manipulation Detection Scheme for Insider Trading
- 243 Karima Gouasmia, Wafa Mefteh and Faiez Gargouri
Mobile and Cooperative Agent based Approach for Intelligent Integration of Complex Data
- 246 Deepika Tenepalli and Navamani T.M
A Review on Machine Learning and Blockchain Technology in E-Healthcare
- 249 Kamal Kumar Gola, Brij Mohan Singh, Mridula Singh, Rohit Kanauzia and Shikha Arya
Underwater acoustic sensor networks: concepts, applications and research challenges
- 254 Joachim Notcker, Emmanuel Adetiba, Abayomi Abdultaofeek, Oluwadamilola Oshin, Aliila Greyson, Ayodele Ifijeh and Alao Babatunde
Interference Detection among Secondary Users De-ployed in Television Whitespace

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December 13, 2022 - Tuesday

13:00 – 14:00 GMT

Plenary 3: Catarina Silva, University of Coimbra, Portugal

Title: Interpretability and Explainability in Intelligent Systems

Chair: Ana Maria Madureira, Institute of Engineering, Polytechnique of Porto, Portugal

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December 13, 2022 - Tuesday

14:00 – 15:00 GMT

Plenary 4: Joanna Kolodziej, NASK- National Research Institute, Warsaw, Poland

Title: Security, reliability and trust in cloud digital service chains – GUARD platform

Chair: Artūras Kaklauskas, Vilnius Gediminas Technical University, Lithuania

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December 13, 2022 - Tuesday

15:00- 17:00 GMT

ISDA 2022: Session 9 & **HIS 2022:** Session 1 (Parallel Session)

Chairs: Catarina Reis, B. Surendiran

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- 262 Chavan Rajkumar Dhaku and Senthil Kumar A
Cryptocurrencies: An Epitome of Technological Populism
- 263 Chavan Rajkumar Dhaku and Senthil Kumar A
Forecasting Bitcoin Price during Covid-19 Pandemic using Prophet and ARIMA: An Empirical Research
- 265 Gajendra Kumar Ahirwar
Comparative Study on Black Hole Attack in Mobile Ad-hoc Networks
- 267 Sasikala C, Rajasekaran Thangaraj, Rajesh Kumar S, Ramachandramoorthy K B, Ramya Subramanian and Umapathi K
Fake Review Prediction using Machine Learning
- 269 Ayoub Hammal, Mehdi Lerari, Khaled Zeraoulia and Youcef Hammal
An efficient resource allocation technique in Fog Environment
- 270 Mridula Singh and Kamal Kumar Gola
Comparative study of various pattern recognition techniques for identifying seismo-tectonically susceptible areas
- 272 Vaishali Mishra and Sonali Kadam
A systematic review on security mechanism of Electric Vehicles

HIS 2022: Session 1

- 5 Alexis Campos, Patricia Melin and Daniela Sanchez
Convolutional neural networks for face detection and face mask multiclass classification
- 7 Stanley Raj A, Mary Henrietta H, Kalaiarasi Kalaiselvan and M Sumathi
A Robust self-generating ANFIS training algorithm for time series and non-time series intended for non-linear optimization
- 12 Hemanth C, Sangeetha R G and Ragamathana R
Design and Implementation of Transceiver module for Inter FPGA Routing



December 13, 2022 - Tuesday

15:00- 17:30 GMT

HIS 2022: Session 2 (Parallel Session)

Chairs: Shankru Guggari, N.Subhashini

- =====
- 17 Arunkumar S, Gerard Deepak, Sheeba Priyadarshini J and Santhana Vijayan Arumugam
PMFRO: Personalized Men's Fashion Recommendation Using Dynamic Ontological Models
 - 19 Vignesh N, Bhuvanewari S, Ketan Kotecha and Subramaniaswamy Vairavasundaram
Hybrid Diet Recommender System using Machine Learning Technique
 - 20 Dhanvardini R, Gerard Deepak, Sheeba Priyadarshini J and Santhanavijayan A
QG-SKI: Question Classification and MCQ Question Generation using Sequential Knowledge Induction
 - 21 Rashiduzzaman Shakil, Bonna Akter, Aditya Rajbongshi, Umme Sara, Mala Rani Barman and Aditi Dhali
A Transfer learning approach to the development of an automation system for recognizing Guava disease using CNN models for feasible fruit production
 - 22 Bui Huy Khoi and Nguyen Thi Ngan
Using Intention of Online Food Delivery Services in Industry 4.0: Evidence from Vietnam
 - 25 Md. Mahbubur Rahman, Badhan Chandra Das, Al Amin Biswas and Md. Musfique Anwar
Predicting Participants' Performance in Programming Contests using Deep Learning
 - 27 Sandeep Trivedi, Nikhil Patel and Nuruzzaman Faruqi
A Novel Lightweight Lung Cancer Classifier through Hybridization of DNN and Comparative Feature Optimizer
 - 28 Murad Al Rajab, Ibrahim Alqatawneh, Ahmad Jasmy and Syed Muhammad Noman
A Smart Eye Detection System Using Digital Certification to Combat the Spread of COVID-19 (SEDDC)
 - 37 Ángeles Cebrián-Hernández, Enrique Jiménez-Rodríguez and Antonio J. Tallón-Ballesteros
Forecasting cryptocurrency volatility: A comparison between AI and GARCH Models
 - 38 Beulah Divya, Gerard Deepak and Santhanavijayan A
I-DLMI: An Integrative Approach for Deep Learning Driven Framework for Web Image Recommendation using Hybrid Intelligence Scheme
 - 40 Nesrine Chaibi, Asma Eladel and Mourad Zaied
SR-Net: A super-resolution image based on DWT and DCNN
 - 41 Nebojsa Bacanin, Miodrag Zivkovic, Zlatko Hajdarevic, Stefana Janicijevic, Anni Dasho, Marina Marjanovic and Luka Jovanovic
Performance of Sine Cosine Algorithm for ANN Tuning and Training for IoT Security
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December 14, 2022 - Wednesday

December 14, 2022 - Wednesday

09:00 – 10:00 GMT

Plenary 5: Katherine Malan, University of South Africa

Title: Landscape analysis of optimisation and machine learning search space

Chair: Artūras Kaklauskas, Vilnius Gediminas Technical University, Lithuania

December 14, 2022 - Wednesday

10:00 – 11:00 GMT

Plenary 6: Mário Antunes, Polytechnic Institute of Leiria, Portugal

Title: Cybersecurity: the road ahead

Chair: Tzung-Pei Hong, National University of Kaohsiung, Taiwan

December 14, 2022 - Wednesday

11:00 - 13:00 GMT

HIS 2022: Session 3 (Parallel Session)

Chairs: André Santos, Vinod Chandra S S

- 42 Aayush Dhatarwal and Saroj Ratnoo
A Review of Deep Learning Techniques for Human Activity Recognition
- 44 José Monteiro, Óscar Oliveira and Davide Carneiro
Selection of replicas with predictions of resources consumption
- 45 Khadija Assafra, Salah Zidi, Bechir Alaya and Mounir Zrigui
VGATS-JSSP: Variant Genetic Algorithm and Tabu Search applied to the Job Shop Scheduling Problem
- 49 Sandeep Trivedi, Nikhil Patel, Nuruzzaman Faruqui and Sheikh Badar Ud Din Tahir
Human Interaction and Classification via K-ary Tree Hashing over Body Pose Attributes using Sports Data
- 57 Ferdib-Al-Islam, Mostofa Shariar Sanim, Md. Rahatul Islam, Shahid Rahman, Rafi Afzal and Khan Mehedi Hasan
Prediction of Dementia Using SMOTE Based Oversampling and Stacking Classifier
- 58 Shaik Hussain and Sana Al-Ghawi
Sentiment Analysis of Real-Time Health Care Twitter Data Using Hadoop Ecosystem
- 59 Gaurav Singh, Parth Pidadi and Dnyaneshwar Malwad
A Review on Applications of Computer Vision
- 64 Chang Wui Lee, Sing Ling Ong and Jill Ling
Incremental Cluster Interpretation with Fuzzy ART in Web Analytics
- 67 Monidipa Das, Aysha Basheer and Sanghamitra Bandyopadhyay
TURBaN: A Theory-guided Model for Unemployment Rate Prediction using Bayesian Network in Pandemic Scenario

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December 14, 2022 - Wednesday

11:00 - 13:00 GMT

HIS 2022: Session 4 (Parallel Session)

Chairs: Abdultaofeek Abayomi, M.Kalamani

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- 68 Akanksha Karotia and Seba Susan
Pre-training meets Clustering: A Hybrid Extractive Multi-Document Summarization Model
- 74 Madhav Avasthi, Gayatri Venugopal and Sachin Naik
Mobile Image Compression Using Singular Value Decomposition And Deep Learning
- 93 Rafsun Jani, Shariful Islam Shanto, Badhan Chandra Dasand Khan Md. Hasib
Machine learning-based Social Media News Popularity Prediction
- 94 Sangeetha G, Hemanth C, Karthika Nair, Akhil Nair and Nithin Shine K
Hand Gesture Control of Video Player
- 100 Samar Bouazizi, Emna Benmohamed and Hela Ltifi
SA-K2PC: optimizing K2PC with Simulated Annealing for Bayesian structure learning
- 104 Helder Gomes Costa, Luciano Souza and Marcos Costa Roboredo
Applying ELECTRE TRI to sort States according the performance of their alumni in Brazilian National High School Exam (ENEM)
- 105 Shivani Malhan and Shikha Agnihotri
Consumer acceptance of Artificial Intelligence constructs on Brand Loyalty in Online Shopping: Evidence from India
- 106 Ritu Gupta
Performance Analysis of Turbo Codes for Wireless OFDM-Based FSO Communication System
- 114 D. Lakshmi Narayana Reddy and C. Shoba Bindu
Topic Modeling Approaches – A Comparative Analysis

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December 14, 2022 - Wednesday

13:00- 15:00 GMT

HIS 2022: Session 5 (Parallel Session)

Chairs: Zechun Cao, Subramaniaswamy V

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- 81 Andrés Leandro and Gabriel Luque
Optimization of Traffic Light Cycles using Genetic Algorithms and Surrogate Models
- 115 K.R. Lavanya and C. Shoba Bindu
Analysis of different ML algorithms applied on Neuroimaging for Brain Tumor Analysis
(Detection, Features selection, Segmentation and Classification)
- 116 Helder Gomes Costa
Visual OutDeck: A web APP for Supporting Multicriteria Decision Modelling of Outranking
Choice Problems
- 118 Ritu Ritu
Concepts for Energy Management in the Evolution of Smart Grids
- 119 Saravanan M, Devi Priya R, Sakthivel K, Sujith J.G., Saminathan A and Vijesh S
Optimized Load Balancing and Routing using Machine Learning Approach in Intelligent
Transportation Systems: A Survey
- 121 Oluwasegun Julius Aroba, Tsepo G. Makwakwa and Kameshni K Chinsamy
An ERP Implementation Case Study in the South African Retail Sector
- 122 Mouthami K, Yuvaraj N and Pooja R.I
Analysis of SARIMA-BiLSTM- BiGRU in furniture time series forecasting
- 123 Saravanan M, Lakshmi Narayanan R and Kavitha K
VANET Handoff from IEEE 80.11p to Cellular network based on Discharging with Handover
Pronouncement based on Software Defined Network (DHP-SDN)
- 125 Devi Priya R and Kirupa P
Attendance Automation System with Facial Authorization and body temperature using Viola-
Jones face detection algorithm
- 126 Saravanan M, Sakthivel K, Sujith J.G., Saminathan A. and Vijesh S.
Vehicle Accident Prediction in smart urban city communication using machine Learning
algorithm



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December 14, 2022 - Wednesday

13:00- 16:00 GMT

IAS 2022: Session 1 (Parallel Session)

Chairs: Rashmi Sahay, M.Satyanarayana

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- 5 Jayaprakash Kar, Aishwarya Mahapatra, Pranav Gupta, Latika Swarnkar and Deeya Gupta
Deployment of Co-operative Farming Ecosystems using Blockchain
- 7 Nguyen Thi Ngan and Bui Huy Khoi
Bayesian Consideration for Influencing a Consumer's Intention to Purchase a COVID-19 Test Stick
- 9 Heera Wali, Shraddha B Hiremath and Nalini C Iyer
Authenticated Encryption Engine for IoT Application
- 11 Francoise Sailhan and Berriche Wassim
Predictive anomaly detection
- 12 Hema Shekhawat and Daya Sagar Gupta
Quantum-defended Anonymous Mutual Authentication and Key-exchange Scheme for the Smart-grid System
- 13 Sumitra Biswal
Intelligent Cybersecurity Awareness and Assessment System (ICAAS)
- 17 Aswathy S U, Bibin Vincent, Pramod Mathew Jacob, Nisha Aniyam, Doney Daniel and Jyothi Thomas
An Efficient Deep Learning Framework FPR Detecting & Classifying Depression Using Electroencephalogram Signals
- 19 Ameni Chetouane and Kamel Karoui
DDoS Detection Approach based on Continual Learning in the SDN Environment
- 27 Rahul, Tanya Singhal, Saloni Sharma and Smarth Chand
Encrypting the colored image by diagonalizing 3D non-linear chaotic map
- 32 Alexander Tarasov, Anna Denisova and Victor Fedoseev
Detection of Presentation Attacks on Facial Authentication Systems using Intel RealSense Depth Cameras
- 34 Hiba El Balbali, Anas Abou El Kalam and Mohamed Talha
Big Data between Quality and Security
- 35 Ayman El Aassal and Stephen Huang
Learning Discriminative Representations for Malware Family Classification
- 38 Murad Rassam
Isolation Forest based Anomaly Detection Approach for Wireless Body Area Networks

December 15, 2022 - Thursday

December 15, 2022 - Thursday

09:00 – 10:00 GMT

Plenary 7: Kaspar Riesen, Institute of Computer Science, University of Bern, Switzerland

Title: Four Decades of Structural Pattern Recognition – An Overview of the Three Major Epochs

Chair: Thomas Hanne, University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

December 15, 2022 - Thursday

10:00 – 11:00 GMT

Plenary 8: Kaisa Miettinen, Multiobjective Optimization Group, Faculty of Information Technology, University of Jyväskylä, Finland

Title: Some Perspectives to Interactive Evolutionary Multiobjective Optimization Methods

Chair: Thomas Hanne, University of Applied Sciences and Arts Northwestern Switzerland, Switzerland



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December 15, 2022 - Thursday

11:00 - 13:00 GMT

SoCPaR 2022: Session 1 (Parallel Session)

Chairs: Ivo Pereira, L. Agilandeewari

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- 5 Sai Prashanth Mallellu, P Vijaya Pal Reddy and Swapna Mudrakola
AI Enabled Chat bot for COVID'19
- 9 Naveenkumar T, Makrand Kulkarni, Harsha Kulkarni, Gururaghavendra H and Jayashree Ranga Reddy
A machine learning approach to Image inpainting
- 11 Rakin Mostafa, Md Humaion Kabir Mehedi, Md. Mustakin Alam and Annajiat Alim Rasel
Bidirectional LSTM and NLP based Sentiment Analysis of Tweets
- 17 Lalasa Mukku and Jyothi Thomas
A Review of Deep Learning Methods in Cervical Cancer Detection
- 22 Shekhar Karanwal
Fused Local Pattern (FLP): A novel Local Descriptor in Pose Variations
- 27 Prashanti Guttikonda and Nirupama Bhat Mundukur
Polynomial-based secret audio sharing scheme with smaller share dimensions and authentication
- 28 Yesim Ruf, Rolf Dornberger and Thomas Hanne
Classification of Brand Images Using Convolutional Neural Networks
- 30 Srikanth Bv, P.V Bhaskar Reddy and PVSSiva Prasad
Machine Learning Based Software effort estimation of suggestive Agile and Scrumban Methodologies
- 31 Mubashir Hussain Kelam, Deepika Koundal and Jatinder Manhas
Machine Learning Techniques for the Diagnosis of Disc Disorders: Comparative Analysis
- 38 Saifur Rahman Shatil and Mir Md. Jahangir Kabir
Retinal OCT Image Classification Based on CNN and Transfer Learning
- 40 Madhuri Devineni Venu, Dheeraj Pavuluri Venkata Naga and Manikandan V M
A Detailed Review on Reversible Data Hiding and Its Applications

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December 15, 2022 - Thursday

11:00- 13:00 GMT

SoCPaR 2022: Session 2 (Parallel Session)

Chairs: Nuno Bettencourt, Farah Jemili

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- 46 Jyothi Thomas, Vandana Reddy, Kumari K and Aswathy S U
Gender identification of silkworm pupa and automated cocoon cutting machine for benefiting the Sericulture grainages in Karnataka
- 50 Sacheth N S and Jayashree R
Emotion Recognition of Speech
- 51 Nayan Varma Alluri and Jayashree R
MPAA rating prediction using script analysis for Movies Using Ensemble Modeling
- 52 Viyyapu Lokeshwari Vinya
An Analysis on Cognitive Radio Adhoc Networks: Categories, Problems, and Solutions
- 56 Manojkumar Manojkumar
Review of supply chain management operational resilience ,risk and disruption in covid-19 pandemic
- 59 Muhammad Uzair, Stefania Tomasiello and Evelin Loit
Interpretable approaches to predict evapotranspiration
- 61 Priyantha Wijayatunga
Some Cases of Prediction and Inference with Uncertainty
- 70 Emmanuel Adetiba, Oluwatomilola Esther Fayomi, Ayodele Ifijeh, Abdultaofeek Abayomi, Joy Nwaogboko Adetiba, Thakur Surendra and Sibusiso Moyo
A Genomic Signal Processing-Based Coronavirus Classification Model using Deep Learning with Web-Based Console
- 72 Devi Priya R, Boggala Thulasi Reddy and Hariharan P
Spider Monkey based K-Means Dynamic Collaborative Filtering for Movie Recommendation Systems
- 80 Shekhar Karanwal
Fused Local Color Pattern (FLCP): A Novel Color Descriptor for Face Recognition
- 90 Karthikeyan B, Srivatsa S, Charuni S A, Mouthami K and Yuvaraj N
Sexism classification in social media using machine learning algorithms



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December 15, 2022 - Thursday

13:00 - 16:00 GMT

NaBIC 2022: Session 1 (Parallel Session)

Chairs: Sebastián Basterrech, Sangeetha R G

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- 4 Thomas Portegys
Morphognostic Honey Bees Communicating Nectar Location Through Dance Movements
- 8 Godson Thomas, Gokul Rejithkumar, Sreevidya P and Beenu Riju
A Two-Way Integrated Communication System for the Deaf and Mute
- 11 Sana Ben Hassine, Elyes Kooli and Rafaa Mraihi
Multi-Agent Smart Parking System with Dynamic Pricing
- 15 Jesus G. Alvarez, Oscar D. Sanchez and Alma Y. Alanis
Model-free Neural Fault-Tolerant Control for Discrete-time Unknown Nonlinear Systems
- 16 Kazushi Fujino, Takeru Aoki, Keiki Takadama and Hiroyuki Sato
Adaptive Synapse Adjustment and Decoding in Action-prediction Cortical Learning Algorithm
- 17 Celia Khelfa, Ilyes Khennak, Habiba Drias, Yassine Drias, Yagoub Belharda and Mehrez Smail
Slime mould algorithm for solving ambulance dispatching problem
- 18 Sebastián Basterrech and Tarun Kumar Sharma
Re-visiting Reservoir Computing architectures optimized by Evolutionary Algorithms
- 19 Shirisha Guguloth, Anusree Telu, Sairam U and Santhosh V
Activity Recognition In Missing Data Scenario Using MICE Algorithm
- 20 Ilyes Khennak, Celia Khelfa, Habiba Drias, Yassine Drias, Nour El Houda Bourouhou and Imene Zafoune
Multi-objective Harris Hawks Optimization for optimal emergency vehicle dispatching during a pandemic
- 21 M.Harsha Vardhan, A. Vamshi Krishna and B.Harish Goud
Framework for Object Recognition and Detection for Blind Users using Deep Learning
- 22 G. N. R. Prasad, Y.Sri Lalitha, Y Gayatri and B Indira
Swasth : An inverse cooking recipe generation from food images
- 26 Shobarani Salvadi, D Nagendra Rao and S Vatsal
Melanoma Cancer Detection using Quaternion Valued Neural Network
- 31 Vihaan Nama and Gerard Deepak
DTagRecPLS: Diversification of Tag Recommendation for Videos using Preferential Learning and Differential Semantics
- 32 Akshay Shankar and Gerard Deepak
SIMWIR: A Semantically Inclined Model for Annotations based Web Image Recommendation Encompassing Integrative Intelligence



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December 15, 2022 - Thursday

13:00- 16:00 GMT

IBICA 2022: Session 1 (Parallel Session)

Chairs: Vijayanand K S, Nalini Iyer

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- 1 Bui Huy Khoi
Bayesian Consideration for Intention to Purchase Safe Vegetables
- 7 Arun Prakash Jayakanthan, Shiva Rupan S, Sowmya V, Moez Krichen and Vinayakumar Ravi
Transfer Learning Based Pediatric Pneumonia Diagnosis using Residual Attention Learning
- 8 Cengiz Kahraman, Basar Oztaysi, Sezi Cevik Onar and Selcuk Cebi
Fuzzy Systems in Bio-Inspired Computing: State-of-the-art Literature Review
- 12 Geetika Johar and Ravindra Patel
Investigating Digital Addiction in the Context of Machine Learning based System Design
- 13 Alfredo Crego, Thomas Hanne and Rolf Dornberger
Multi-objective Optimization of Airline Crew Management with a Genetic Algorithm
- 16 Hideyasu Sasaki
Bio-inspired Heterogeneity in Swarm Robots
- 18 Filipe Alves, Ana Rocha, Ana Pereira and Paulo Leitão
A Systematic Literature Review on Home Health Care Management
- 22 Nokukhanya Thembane
E-Assessment in Medical Education: From Paper to Platform
- 25 Sweety Singh, Poonam Sheoran, Manoj Duhan, Neeru Rathee and Pradeep Khola
Automated Depression Diagnosis in MDD (Major Depressive Disorder) Patients using EEG signal
- 26 Ajesh F, Anupama Jims, Bosco Paul Alapatt and Felix M Philip
An effective deep learning classification of Diabetic based eye disease grades: A retinal analysis approach
- 28 Velislava Stoykova
Extracting and Analyzing Terms with the Component 'Green' in the Bulgarian Language: a Big Data Approach
- 29 Vadivel S M, Sakthivel V, Praveena L and Chandana V
Apartments waste Disposal location evaluation using TOPSIS and fuzzy TOPSIS methods
- 30 Tiago Fonseca and João Ferreira
Damage assessment of building facades using infrared thermography
- 32 Duarte Coelho, Ana Madureira and Ivo Pereira
A Review on Dimensionality Reduction for Machine Learning

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December 15, 2022 - Thursday

16:00- 17:30 GMT

IBICA 2022: Session 2 (Parallel Session)

Chairs: André Santos. Bruno Miguel Almeida Cunha

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- 35 Ana Pires, João Ferreira and Øystein Klakegg
The Future in Fishfarms: an Ocean of Technologies to Explore
- 36 Marko Stankovic, Luka Jovanovic, Nebojsa Bacanin, Miodrag Zivkovic, Milos Antonijevic and Petar Bisevac
Tuned Long Short-Term Memory Model for Ethereum Price Forecasting through an Arithmetic Optimization Algorithm
- 38 Payal Goel and Shweta Bansal
Comprehensive and Systematic Review of Various Feature Extraction Techniques for Vernacular Languages
- 39 Robert Dietze and Maximilian Kränert
Parallel Ant Colony Optimization for Scheduling Independent Tasks
- 40 Bruno Cunha, Ana Madureira and Lucas Gonçalves
A Review on Artificial intelligence applications for Multiple Sclerosis Evaluation and Diagnosis
- 41 Aastha Valecha, Gerard Deepak and Deepak Surya Sivakumar
KIASOntoRec: A Knowledge Infused Approach for Socially Aware Ontology Recommendation
- 43 Inês César, Ivo Pereira, Ana Madureira, Duarte Coelho, Miguel Ângelo Rebelo and Daniel Alves de Oliveira
Analysing and Modeling Customer Success in Digital Marketing
- 44 Arulmozhi Varman, Gerard Deepak and Sheeba Priyadarshini J
DRHTG: A Knowledge-Centric Approach for Document Retrieval Based on Heterogeneous Entity Tree Generation and RDF Mapping
- 45 Deepak Surya Sivakumar, Palvannan S and Gerard Deepak
Bi-CSem: A Semantically Inclined Bi-Classification Framework for Web Service Recommendation

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December 15, 2022 - Thursday

16:00- 17:30 GMT

IBICA 2022: Session 3 (Parallel Session)

Chairs: Ana Maria Madureira, Nidhi Sindhwani

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- 46 Divyanshu Singh and Gerard Deepak
HybRDFSciRec: Hybridized Scientific Document Recommendation Framework
- 47 László Antal, Martin Aubard, Erika Ábrahám, Ana Madureira, Luís Madureira, Maria Costa,
José Pinto and Renato Campos
A Collision Avoidance Method for Autonomous Underwater Vehicles based on Long Short-Term
Memories
- 50 Shaik Habeeba Tabassum, B. Sunil Kumar and Pydala Bhasha
An Efficient Machine Learning Model for Bitcoin Price Prediction
- 51 P Penchalaiah, P. Harini Sri Teja and Bhasha Pydala
Ensemble Based Cyber Threat Analysis for Supply chain Management
- 52 A.Madhavee Latha and K.M.Vara Prasad
Classification Model for Identification of Internet Loan Frauds Using PCA with Ensemble
Method
- 53 S. Mano Venkat, C. Rajendra and Venu Madhav K
Comparitive Analysis of Learning Models in Depression Detection Using MRI Image Data
- 55 Hariprasad Tarigonda, Meenakshi Reddy R, B. Anjaneyulu, Dharmalingam G, D.Raghu Rami
Reddy and K.L. Narasimham
Optimization of the performance and emissions of a dual-fuel diesel engine using LPG as the
fuel
- 59 Beulah Divya and Gerard Deepak
WCMIVR: A Web 3.0 compliant Machine Intelligence driven Scheme for Video
Recommendation

December 16, 2022 - Friday

December 16, 2022 - Friday

09:00 – 10:00 GMT

Plenary 9: Yifei Pu, Sichuan University, China

Title: Analog Circuit Implementation of Fractional-Order Memristor: Arbitrary-Order Lattice Scaling
Fracmemristor

Chair: Alexey KornaeV, Innopolis University, Russia



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December 16, 2022 - Friday

10:00 - 12:30 GMT

WICT 2022: Session 1

Chairs: João Carlos Ferreira, Nuno Bettencourt

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- 6 Ibidun Christiana Obagbuwa, Stefany Bam and Moroka Dineo Tiffany
Modelling and Simulation of the Dump-Truck Problem using MATLAB Simulink
- 7 Ibidun Christiana Obagbuwa and Kutlo Baldwin Mogorosi
Modeling and Simulation of a Robot arm with Conveyor Belt Using Matlab Simulink Model
- 10 Bui Huy Khoi
Bayesian Model Selection for Trust in Ewom
- 13 Shankru Guggari, Kingsley Okoye and Ajith Abraham
Review of challenges and best practices for Outcome Based Education: an exploratory outlook on main contributions and research topics
- 16 Cengiz Kahraman, Basar Oztaysi, Sezi Cevik Onar and Selcuk Cebi
Fuzzy Investment Assessment Techniques: A State-of-the-art Literature Review
- 18 Prashasti Kanikar, Manoj Sankhe and Deepak Patkar
A Comparative Analysis of Classification Algorithms for Dementia Prediction
- 20 Prashasti Kanikar, Manoj Sankhe and Deepak Patkar
Comparative Analysis of Filter Impact on Brain Volume Computation
- 23 Samuel S Mitra, Peter Arockiam. A. Sj, Milton Costa Sj, Aparajita Hembrom and Payal Sharma
Rationalizing the TPACK Framework in Online Education– Perception of College Faculties towards Aakash BYJU'S App in the 'new normal
- 28 Teresa Guarda and Isabel Lopes
Augmented Analytics an Innovative Paradigm

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December 16, 2022 - Friday

12:30 - 15:00 GMT

WICT 2022: Session 2

Chairs: Susana Nicola, B.Rama Rao

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- 140 Rakshana B.S, Anahitaa R, Srinivasa Rao Ummity and Ramesh Ragala
ISDA Simulation, Perception, and Prediction of the Spread of COVID - 19 on Cellular Automata Models: A Survey
- 30 Fátima Rodrigues and Jacqueline Marchetti
A deep learning approach to monitoring workers' stress at office
- 33 Sara Gomes, Luis B. Elvas, João C. Ferreira and Tomás Brandão
Automatic Calcium Detection in Echocardiography based on Deep Learning: A Systematic Review
- 34 Ana Vieira, Luis B. Elvas, João C. Ferreira and Miguel Sales Dias
AI-Based mHealth App for Covid-19 or Cardiac Diseases Diagnosis and Prognosis
- 40 Luis B Elvas, João Ferreira, Luis Rosario and Filipe Rana
Wearable Temperature Sensor and Artificial Intelligence to Reduce Hospital Workload
- 42 Enzo Luciano Zickler Paz, Susana Nicola and Nuno Bettencourt
A Recommender System to Close Skill Gaps and Drive Organizations' Success
- 52 Nirmala Kuraku and Saruladha K
Denoising Fundus Images of Diabetic Retinopathy using Natural Neighborhood Kriging
- 53 Bonula Rama Rao, K S Chakradhar, M Satyanarayana, A V Sriharsha and D Nataraj
Design of a Compact Low-Profile Ultra Wideband Antenna (UWB) for Biomedical Applications
- 54 Arunkumar Beyyala, R Priya, Subramani Roy Choudri and R Bhavani
Thyroid Nodule Classification in Ultra Sound Images using Convolutional Neural Networks

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December 16, 2022 - Friday

15:00 – 16:00 GMT

Plenary 10: Patricia Melin, Tijuana Institute of Technology, Tijuana, Mexico

Title: Hybrid Intelligent Systems based on Neural Networks, Fuzzy Logic and Bioinspired Optimization Algorithms and their application to Pattern Recognition

Chair: Artūras Kaklauskas, Vilnius Gediminas Technical University, Lithuania

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December 16, 2022 - Friday

16:00 GMT

Conference Closing Ceremony

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ISDA 2022 - Offline Presentations

December 12, 2022 - Monday

09:00 - 13:00 GMT

ISDA 2022: Offline Session 1

Chairs: Zechun Cao

- 5 Ashvanth R, Gerard Deepak, Sheeba Priyadarshini J and Santhana Vijayan Arumugam
KMetaTagger: A Knowledge Centric Metadata Driven Hybrid Tag Recommendation Model
Encompassing Machine Intelligence

- 8 Gayatri Malhotra, Punithavathi Duraiswamy and J. K. Kishore
GA Evolved Configuration Data for Embryonic Architecture with Built-in Self-test

- 11 Hounaida Sakly, Mourad Said and Moncef Tagina
Medical decision making based 5D Cardiac MRI Segmentation Tools

- 15 Timo Schöpflin, Pascal Zimmerli, Rolf Dornberger and Thomas Hanne
Weighted Pathfinding in the Paparazzi Problem with Dynamic Obstacles

- 16 Elaine Pinto Portela, Omar Andres Carmona Cortes and Josenildo Costa da Silva
A Rapid Review on Ensemble Algorithms for COVID-19 Classification Using Image-Based
Exams

- 19 Anindya Nag, Ayontika Das, Riya Sil, Anwasha Kar, Dishari Mandal and Biva Das
Application of Artificial Intelligence in Mental Health

- 20 Danilo G. de Oliveira, José Francisco S. Filho, Fabiano Miranda, Pedro H. Serpa and Rafael
Stubs Parpinelli
Cold Rolling Mill Energy Consumption Prediction Using Machine Learning

- 21 Maissa Hamouda and Med Salim Bouhlef
Virtual Reconstruction of Adaptive Spectral and Spatial Features based on CNN for HSI
Classification

- 22 Dhiraj Kumar, Diptirtha Chatterjee, Bibek Upadhyaya, Shailendra Nath Yadav and Jyoti Singh
Kirar
Enhancing Rental Bike Count and availability prediction using Regression Modelling

- 24 Lidio Mauro Lima De Campos
Time Series Forecast Applied to Electricity Consumption

- 25 Akshita Tygai, Terrance Frederick Fernandez, Shantha K and Amit Kumar Tyagi
A Survey on Text Processing Using Deep Learning Techniques

- 27 Ananya Uppal, Maitreyi P, Mamatha Hr and Jamuna
RePI : Research Paper Impact Analysis

- 28 Michele Della Ventura
Human-Centred Artificial Intelligence in Sound Perception and Music Composition

- 29 Mehdi Achour and Amine Boufaied
Multi-objective Optimization for sensor networks based Smart Parking Systems

- 33 Ingolf Gehrhardt, Fouad Bahrpeyma and Dirk Reichelt
A Concept for QoS Management in SOA-based SoS Architectures
- 34 Zainab Saad Rubaidi, Boulbaba Ben Ammar and Mohamed Ben Aouicha
Comparative Data Oversampling Techniques with Deep Learning Algorithms for Credit Card Fraud Detection
- 40 Azdine Bilal, Abdelhadi Ifleh and Mounime El Kabbouri
Prediction of Stock Price Direction Combining Volatility Indicators with Machine Learning Algorithms
- 41 Nasser Ghadiri, Rasoul Samani and Fahime Shahrokh
Integration of Text and Graph-based Features for Depression Detection using Visibility Graph
- 43 Bernard da Silva, Ana Paula Athayde Carneiro, José Osvaldo Amaral Tepedino, Jose Francisco Silva Filho, Fabiano Miranda and Rafael Stubs Parpinelli
Automotive Stamping Process Optimization Using Machine Learning and Multi-objective Evolutionary Algorithm
- 44 El Mostafa Bourhim and Oumayma Labti
Augmented Reality in Marketing Sector: Viewpoint of XR the Moroccan Association Experts
- 45 Silas Santiago Lopes Pereira and José Everardo Bessa Maia
Improving MIL Video Anomaly Detection Concatenating Deep Features of Video Clips
- 46 Abdelhadi Ifleh, Bilal Azdine and Mounime El Kabbouri
Moroccan Stock Price Prediction Using Trend Technical Indicators: A Comparison Study
- 47 Anindya Nag, Gulfishan Mobin, Anwesha Kar, Tanushree Bera and Pretam Chandra
A review on cloud-based smart applications
- 51 Damir Aminev, Nikita Demyanchuk and Alexander Hvatov
On a structure of an automated differential equation solver based on machine learning methods
- 54 Ioannis Pierros, Eleftherios Kouloumpis, Dimitrios Zaikis and Ioannis Vlahavas
Retail Demand Forecasting for 1 Million Products
- 55 Vinicius Fulber-Garcia, Marcelo Caggiani Luizelli, Carlos Raniery Paula dos Santos, Eduardo J. Spinosa and Elias Procopio Duarte Jr.
Intelligent Mapping of Virtualized Services on Multi-Domain Networks
- 56 Maísa Fernandes Gomes and Rafael Stubs Parpinelli
Fundus Eye Image Classification and Interpretation for Glaucoma Diagnosis
- 57 Yasmine Kamel, Farah Jemili and Rahma Meddeb
Ensemble Learning based Big Data Classification for Intrusion Detection
- 58 El Mostafa Bourhim and Oumayma Labti
Application of Combined SWOT and AHP Analysis to Assess the Virtual Reality and Select the Priority Factors for Education
- 59 Mohammed Rashad Baker, Esraa Zeki Mohammed and Kamal H. Jihad
Prediction of Colon Cancer Related Tweets using Deep Learning Models

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December 12, 2022 - Monday

13:00 - 17:00 GMT

ISDA 2022: Offline Session 2

Chairs: Shweta Bansal, Prashasti Kanikar

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- 61 Shabnam Kumari and Muthulakshmi P
High-Performance Computation in Big Data Analytics
- 64 Dorra Kallel, Ines Kanoun and Diala Dhouib
Performing systematic review on personalized menu scheduling using PRISMA guidelines
- 66 Wadie Skaf, Arzu Tosayeva and Dániel T. Várkonyi
Towards Automatic Forecasting: Evaluation of Time-Series Forecasting Models for Chickenpox Cases Estimation in Hungary
- 68 Jarray Nouredine, Ben Abees Ali and Farah Imed Riadh
A Machine Learning Framework for Cereal Yield Forecasting Using heterogeneous data
- 69 Luís Fabrício de Freitas Souza, José Jerovane da Costa Nascimento, Cyro M. G. Sabóia, Adriell Gomes Marques, Guilherme Freire Brilhante, Lucas de Oliveira Santos, Paulo A. L. Rego and Pedro Pedrosa Reboucas Filho
New Approach in LPR Systems Using Deep Learning to Classify Mercosur License Plates with Perspective Adjustment
- 70 Orrana Sousa, David Silva, Victor Campelo, Romuere Silva and Deborah Magalhães
Ensemble of Classifiers for Multilabel Clinical Text Categorization in Portuguese
- 71 Hamza Hadri, Abderahhim Fail and Mohamed Sadik
Semantic segmentation using MSRFNET for ultrasound breast cancer
- 73 Kumar D and Sudha V K
A Hybrid Image Steganography method based on spectral and spatial domain with high hiding ratio
- 74 Huang Zhidong, Li Peipei and Hu Xuegang
PU matrix completion based Multi-Label Classification with Missing Labels
- 80 Mohamed Zouidine, Mohammed Khalil and Abdelhamid Ibn El Farouk
Pre-processing and Pre-trained Word Embedding Techniques for Arabic Machine Translation
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Chairs: Gurram Sunitha

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09:00 - 13:00 GMT

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- 4 Gayatri Venugopal and Dhanya Pramod
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- 9 Ha Duyen Trung
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- 26 Ines Lahmar, Aida Zaier, Mohamed Yahia and Ridha Bouallegue
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- 33 Yuvaraj N, Praghash K, Arshath Raja R, Chidambaram S and Shreecharan D
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- 48 Elbehy Ichrak, Hadriche Abir, Jarray Ridha and Jmail Nawel
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- 50 Beatriz Bernábe Loranca, Marleni Reyes Monreal, Alberto José Luis Carrillo Canán and Carmen Ceron
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- 51 Alexander Bozhenyuk, Evgeniya Gerasimenko and Sergey Rodzin
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- 52 Nouha Arfaoui
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- 54 João Alcântara, João Monteiro-Filho, Isabela Albuquerque, João Vilar-Dias, Marcelo Lacerda and Fernando Lima-Neto
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- 55 Fethi Fkih and Delel Rhouma
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- 56 Luciano De Souza, Wesley Souza, Welesson Silva, Hudson Souza, João Carlos Mello and Helder Costa
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- 60 Pooja Manghirmalani Mishra and Sushil Kulkarni
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A new Filter Feature Selection Method based on a Game Theoretic Decision Tree
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- 23 Samaher Al-Janabi
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- 34 Samaher Al-Janabi and Zena Ahmed
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- 90 P. Vanitha, G K. Kamalam and V.P. Gayathri
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- 99 Noémi Gaskó
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- 102 Rodica Ioana Lung
A Gaussian Mixture Clustering approach based on Extremal Optimization
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Analytical study of Starbucks using clustering
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Analytical Study of Effects on Business Sectors during Pandemic- Data Mining approach
- 132 Prakash K, Yuvaraj N, Geno Peter, Albert Alexander Stonier and Devi Priya R
Financial Big Data Analysis Using Anti-Tampering Blockchain-Based Deep Learning
- 133 Mythili S, Pousia S, Kalamani M, Hindhuja V, Nimisha C and Jayabharathi C
A handy diagnostic tool for early congestive heart failure prediction using Catboost classifier
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- 8 Kazumasa Omote, Yuto Tsuzuki, Keisho Ito, Ryohei Kishibuchi, Cao Yan and Shohei Yada
Analysis and Risk Consideration of Worldwide Cyber Incidents Related to Cryptoassets
- 10 Quang-Vinh Dang
Multi-layer Intrusion Detection on the USB-IDS-1 dataset
- 14 Sampsa Rauti, Samuli Laato and Ali Farooq
A Study on Written Communication about Client-Side Web Security
- 16 Chidimma Opara, Yingke Chen and Bo Wei
It's All Connected: Detecting Phishing Transaction Records on Ethereum Using Link Prediction
- 18 Alan Asanov, Yulia Vybornova and Victor Fedoseev
Comparative study of compact descriptors for vector map protection
- 21 Urmila Devi and Shweta Bansal
Secure E-Voting System – A Review
- 22 Hamdi Eltaief, Kawther Thabet and El Kamel Ali
Securing East-West Communication in a Distributed SDN
- 23 I Gede Agung Krisna Pamungkas, Tohari Ahmad, Royyana Muslim Ijtihadie and Ary
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Implementing Autoencoder Compression to Intrusion Detection System
- 24 Maroua Moatemri, Hamdi Eltaief, Ali El Kamel and Habib Youssef
Secure East-West Communication to Authenticate Mobile Devices in a Distributed and
Hierarchical SDN
- 26 Sabrina Tarannum, Syed Md. Minhaz Hossain and Taufique Sayeed
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- 28 Timi Heino, Sampsa Rauti, Robin Carlsson and Ville Leppänen
Study of Third-Party Analytics Services on University Websites
- 31 Jehan Hasneen, Vishnupriya Narayanan and Kazi Masum Sadique
A Systematic Literature Review on Security Aspects of Virtualization
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SoCPaR 2022 - Offline Presentations

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11:00 - 17:00 GMT

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Chairs: Nouhaila Bensalah

- 4 Bushra Khatoon Zaidi, Atifa Arshad and Alok Gupta
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- 6 Gözde Alp and Ali Fuat Alkaya
A Novel Framework for Multi-Objective Optimization Problems

- 7 Ranjita Rout, Priyadarsan Parida and Sonali Dash
A hybrid deep learning network for skin lesion extraction

- 8 Norfadzlia Mohd Yusof, Azah Kamilah Muda, Satrya Fajri Pratama, Ramon Carbo-Dorca and Ajith Abraham
Binary Whale Optimization Algorithm with Logarithmic Decreasing Time-Varying Modified Sigmoid Transfer Function for Descriptor Selection Problem

- 10 Nunik Destria Arianti, Azah Kamilah Muda and Norashikin Ahmad
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- 12 Ali Naeemah and Kuan Yew Wong
A Weighted Fuzzy Approach for Choosing Lean Manufacturing Tools Based on Their Effects on Sustainability

- 19 N.Anitha Natarajan, Devi Priya R, Baskar C and Devisurya V
An effective logistics network design using Donkey-Smugglers Optimization (DSO) Algorithm

- 20 Ryotaro Kamimura
Comprehensive Potentiality Maximization to Improve and Interpret Multi-Layered Neural Networks

- 21 Sandhya Mishra and Devpriya Soni
SMS Phishing Dataset for Machine Learning and Pattern Recognition

- 23 Kien Phan, Anh Nguyen Thuy, Binh Doan Thanh, Phu Nguyen Trung and Nhung Dinh Thi
Assessing Bicep Curl Exercises By Human Pose Application: A Preliminary Study

- 24 Chiranjib Kalita and Kuntala Boruah
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- 25 Kuntala Boruah and Ranjan Sarmah
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- 29 Kien Nguyen Phan, Cuong Pham Minh, Nghia Nguyen Quang, Phuong Bui Thi Mai and Nhung Dinh Thi
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- 53 Falin Wu, Reza Maleki, Amel Oubara, Dimaris G'Omez, Akram Eftekhari and Gongliu Yang
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Deep convolutional neural network model for classifying Alzheimers disease
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- 67 Hermann Tapamo, Anna Bosman, James Maina and Emile Horak

- Convolutional neural networks for crack detection on flexible road pavements
- 69 Agilandeewari L, Nivetha S, Tirthankar Chakraborty and Vikash Chand
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- 71 Gitanjali Mishra, Nilambar Sethi and Agilandeewari L
Fuzzy Bi-GRU based Hybrid Extractive and Abstractive Text Summarization for multi-documents
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- 3 Serge Dolgikh
From Data to Model: Evolutionary Learning with Generative Neural Systems
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- 10 Paolo Pagliuca and Alessandra Vitanza
Self-Organized aggregation in group of robots with OpenAI-ES
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IBICA 2022 - Offline Presentations

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- 5 Nesrine Bnoui Rhim, Salim Cheballah and Mouna Ben Mabrouk
Cross Synergetic Mobilenet-VGG16 for UML Multiclass Diagrams Classification
- 6 Yahia Amoura, Santiago Torres, José Lima and Ana Isabel Pereira
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13:00 - 15:00 GMT

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Plenary speaker Abstracts and Biographies



Patrik Christen

FHNW, Institute for Information Systems, Olten, Switzerland

Title: Biology-Inspired and Philosophy-Guided Modelling of Complex Systems

Abstract: Understanding complex systems such as living organisms is challenging because traditional analytical approaches for studying them are not well suited to model environments that change over time. Algorithmic approaches such as cellular automata and agent-based models have been proposed allowing to specify local rules that determine the dynamics of the system's entities and where the global system's dynamics emerges from dynamically interacting entities. It is straightforward to implement rules that update the environment simultaneously with the update of entities thus providing a more natural way to model complex systems in general. Even more so, it allows to study a system's behaviour based on the behaviour of entities, e.g., simple rules of a biological cell can be implemented and the emerging behaviour forming a tissue or tumour can be investigated. More generally speaking, this is a way to implement biology-inspired rules that can be experimentally measured and based on them the emergent complex behaviour of the system studied. However, we still lack understanding and tools for exploring what is happening between local rules and the resulting emergent behaviour. In the present talk, I present a computational framework to describe, model, implement, and interpret complex systems attempting to close the gap between rules and emergent behaviour. The framework is based on philosophy, particularly Gilbert Simondon's philosophy of individuation implementing the concepts of structure and operation, and Alfred N. Whitehead's philosophy of organism implementing the concepts of entity, adaptation, and control. The idea is to guide the modelling and implementation of biology-inspired models as well as follow their simulation by relating them to philosophical concepts. Here, I use the computational framework for philosophy-guided modelling and implementation of gene regulation inspired self-modifying code exemplifying the proposed approach.

Biography: Patrik Christen is a lecturer of mathematics and programming at the Institute for Information Systems at FHNW. Prior to his current position, he held senior assistant and senior research associate positions at the Institute for Biomechanics at ETH Zurich and the Oxford Flight Group at the University of Oxford, respectively. He co-authored 90 conference contributions and 27 journal articles. He works on the modelling and simulation of complex systems with applications to open-ended evolutionary systems, self-modifying code, and explainable AI. His approach is inspired by biology, particularly evolution and gene regulation, and guided by philosophy, particularly Gilbert Simondon's philosophy of individuation and Alfred N. Whitehead's philosophy of organism. He is developing a computational framework to describe, model, implement, and interpret complex systems, and already showed that it allows implementing and exploring computational models such as cellular automata and artificial neural networks as well as deep concepts such as adaptation and control. The framework is currently used to explore and simulate open-ended evolution and self-modifying code, to implement a neurally-inspired data structure, and to better understand the inner workings of artificial neural networks.



Maki Sakamoto

The University of Electro-Communications, Tokyo, Japan

Title: Computer Vision for Expressing Texture Using Sound-Symbolic Words

Abstract: The major goals of texture research in computer vision are to understand, model, and process texture and ultimately simulate human visual information processing using computer technologies. The field of computer vision has witnessed remarkable advancements in material recognition using deep convolutional neural networks (DCNNs), which have enabled various computer vision applications, such as self-driving cars, facial and gesture recognition, and automatic number plate recognition. However, for computer vision to “express” texture like human beings is still difficult because texture description has no correct or incorrect answer and is ambiguous. In this paper, we develop a computer vision method using DCNN that expresses texture of materials. To achieve this goal, we focus on Japanese “sound-symbolic” words, which can describe differences in texture sensation at a fine resolution and are known to have strong and systematic sensory-sound associations. Because the phonemes of Japanese sound-symbolic words characterize categories of texture sensations, we develop a computer vision method to generate the phonemes and structure comprising sound-symbolic words that probabilistically correspond to the input images. It was confirmed that the sound-symbolic words output by our system had about 80% accuracy rate in our evaluation.

Biography: Dr. Maki Sakamoto is Professor of Affective Engineering in Department of Informatics, The University of Electro-Communications. She received her Ph.D. in Language and Information Sciences from the University of Tokyo in 2000. From 1998 to 2000, she was an Assistant Professor at the University of Tokyo. In 2000 she moved to the University of Electro-Communications as a Lecturer. She became an Associate Professor in 2004 and a Professor in 2015. She is a vice-director of Artificial Intelligence Exploration Research Center. In 2014, she received the best paper award from the Japanese Society for Artificial Intelligence. Her current research interests are in language, cognition, perception, affective engineering including affective AI. She is a board member of JSAI and JCSS.



Catarina Silva

University of Coimbra, Portugal

Title: Interpretability and Explainability in Intelligent Systems

Abstract: Intelligent methods, as deep neural networks, are becoming standard go-to algorithms for a wide range of applications. However, applicability in several critical applications, e.g., public policy, security/safety systems, health diagnosis and fraud detection, has been faced with some hurdles due to lack of model interpretability. Such systems suffer from interpretability/explainability issues and in this talk an overview of challenges and current approaches is presented, including case studies.

Biography: Catarina Silva is Assistant Professor at the Department of Informatics Engineering of the University of Coimbra. She has a PhD degree in Computer Engineering, with 20 years' experience teaching Computer Engineering BSc and MSc, while also supervising MSc and PhD students. She is a senior researcher at the Adaptive Computation Group of CISUC with machine learning and pattern recognition as main areas of research. Skilled at managing different sized projects and scientific entrepreneurships, involving people with different backgrounds, namely faculty, students, alumni, and companies. Author and co-author of 4 books, circa 20 journal articles and 50 conference papers. Scientific committee and paper reviewer of several conferences and journals. President of the General Assembly of the Portuguese association of pattern Recognition, IEEE senior member of the Computational Intelligence Society. Past-Chair of the IEEE Portugal Section.



Joanna Kolodziej

Cracow University of Technology, Poland

Title: Security, reliability and trust in cloud digital service chains – GUARD platform

Abstract: Evolving computing paradigms are progressively introducing new design, development, and operation models for digital services, which increasingly leverage service oriented architectures and microservices patterns to create data-centric applications. This approach eventually brings more agility in the overall service lifetime management, but also introduces additional security and privacy concerns that cannot be effectively addressed by legacy device- and infrastructure-centric models. In this talk, the recent developments in secure cloud computing business-related models will be surveyed, along with the presentation of the main results of the H2020 GUARD project. The GUARD project developed an extensible platform for building detection and analytics services for advanced assurance and protection of trustworthy and reliable business chains which span multiple administrative domains and heterogeneous infrastructures. GUARD advocates the implementation of embedded security capabilities in digital services that can be accessed and orchestrated through API, similar to what already happens for management and operation purposes. GUARD features are demonstrated in two challenging use cases in the Smart Mobility and eHealth domains. The detailed information about the GUARD platform is available on the following webpage - <https://guard-project.eu/>.

Biography: She is a Professor in the Research and Technology Transfer Unit of NASK Poland in Warsaw since September 1, 2019. She is also a research collaborator of the Intelligent Information Systems Group at AGH University of Science and Technology. Graduated from Jagiellonian University in Cracow and received MSD in theoretical mathematics and PhD in theoretical computer science. The current topics of research include grid and cloud computing, energy effectiveness and secure awareness in large scale distributed systems, data intensive computing, cybersecurity in ICT infrastructures. She is the coordinator of the NASK team in H2020 GUARD project (<https://guard-project.eu/>), CUT team in BalticSatApps EU InterReg Project (<http://balticsatapps.eu/>) and is an Advisory Board member of H2020 Panelfit Project (<https://www.panelfit.eu/>) and is also the PI of H2020 COST IC1406 Project cHiPSet (<http://chipset-cost.eu/>).



Katherine MALAN

Department of Decision Sciences, University of South Africa

Title: Landscape analysis of optimisation and machine learning search spaces.

Abstract: The notion of a fitness landscape was first introduced in 1932 to understand natural evolution, but the concept was later applied in the context of evolutionary computation to understand algorithm behaviour on different problems. In the last decade, the field of fitness landscapes has experienced a large upswing in research, evident in the increased number of published papers on the topic as well as regular tutorials, workshops and special sessions at all the major evolutionary computation conferences. More recently, landscape analysis has been used in contexts beyond evolutionary computation in areas such as feature selection for data mining, hyperparameter optimisation, neural network training and neural architecture search.

This talk will provide an overview of the applications of landscape analysis for understanding complex problems and explaining algorithm behaviour in optimisation and machine learning. Particular emphasis will be placed on the use of landscape analysis for intelligent algorithm selection. In addition, a new modelling and visualisation technique called Search Trajectory Networks (STNs) for analysing search landscapes through the trajectories of algorithms will be presented. What algorithms "see" as they move through the search space of different problems can help us understand how search algorithms behave on problems with different characteristics. Case studies will be presented of recent applications of landscape analysis in both discrete and continuous optimisation domains including examples from the domain of machine learning.

Biography: Katherine Malan is an associate professor in the Department of Decision Sciences at the University of South Africa. She has 25 years' lecturing experience, mostly in Computer Science, at three different South African universities. Her research interests include fitness landscape analysis and the application of computational intelligence techniques to real-world problems. She is particularly interested in the link between complex problem characteristics and algorithm behaviour with the aim of achieving intelligent automated algorithm selection. She serves as the editor-in-chief of South African Computer Journal, associate editor for Engineering Applications of Artificial Intelligence and actively reviews for over 20 Web of Science journals and many conferences in artificial intelligence, computer science and operations research.



Mário Antunes

Polytechnic Institute of Leiria, Portugal

Title: Cybersecurity: the road ahead

Abstract: The pace of cyberattacks against enterprise information systems and critical IT infrastructures has challenged IT security practitioners and decision makers to invest in security technology and to raise the level of cybersecurity response. The investment in cybersecurity has been made in two distinct but complementary areas:

IT technology and cyber awareness. From the technology side, IoT, IoMT and Industry 4.0 just to mention a few, have leveraged a wide set of improvements in the devices, software and security appliances. From the human factor side, as it depends on people's behaviour and attitudes, the key is to invest in onsite continuous education.

This talk aims to overview the existing technologies to face cybersecurity threats and vulnerability exploits and describes the emergent strategies being developed, mostly using AI, to deal with cybercrime. A set of cyber awareness strategies will be described, namely those involving gamification and innovative onsite learning for the ordinary employee.

Biography: Mário Antunes is Ph.D. in Computer Science and has a MSc in Informatics, Systems and Networks, both from University of Porto, Portugal.

He is Coordinator Professor at the Department of Computer Engineering of the School of Technology and Management of the Polytechnic Institute of Leiria, in Portugal.

Since 2011 he has been senior researcher at INESC TEC, and since 2017 he has collaborated with Computer Science and Communication Research Centre (CIIC), a research center of Polytechnic of Leiria. His research interests are cybersecurity, information and network security, anomaly and intrusion detection, cloud security, digital forensics and datacenters technologies.



Kaspar Riesen

Institute of Computer Science, University of Bern, Switzerland
University of Applied Sciences and Arts, Switzerland

Title: Four Decades of Structural Pattern Recognition – An Overview of the Three Major Epochs

Abstract: Abstract. Actually, science is facing rapidly increasing amounts of data (e.g., high-throughput profiles of biological systems, to name just one example). The ability of managing, searching, classifying, or interpreting these data sets has emerged to a crucial scientific challenge. Simultaneously, one observes that in many applications the underlying data is inherently complex, making unary, fixed size data structures rather inappropriate for basic data representation.

This is where graphs come into effect. Graphs consist of arbitrarily sized sets of (labeled) nodes and edges, allowing us to model entities and relationships at the same time. Due to inherent problems that exist in the domain of graphs, both the power and flexibility are traditionally sacrificed for more rigid data representations. In recent years, however, several novel and innovative solutions for the problems of graph-based data representations have been developed and researched.

The field of graph-based pattern recognition has a long tradition and can roughly be subdivided into three main periods of time:

– First era: Graph matching

The process of evaluating the dissimilarity or similarity of two graphs is commonly referred to as graph matching. The overall aim of graph matching is to find a correspondence between the nodes and edges of two graphs that satisfies some, more or less, stringent constraints. Roughly speaking, one distinguishes between exact and inexact, sometimes referred to as error-tolerant, graph matching. Major paradigms of exact graph matching are graph isomorphism, subgraph isomorphism, maximum common subgraph, and related concepts. Examples of error-tolerant graph matching include, for instance, Graph Edit Distance, Spectral methods, Expectation Maximization algorithms, and many others.

– Second era: Graph kernel

The paradigm of kernel functions is originally developed for vectorial representations, but the kernel framework can be extended to graphs in a very natural way. Actually, graph kernels have emerged to a widely-used technique for solving graph classification tasks. Seminal contributions in the field of graph kernel are the works on convolution kernels, graph kernels based on the analysis of walks or paths, diffusion kernels, or so called neighborhood aggregation approaches.

– Third era: Graph neural networks

After the first revolution of graph-based pattern recognition via graph kernels, that made powerful kernel machines applicable to graphs (like Support Vector Machines, for instance), the adaptation of neural networks, and in particular, deep neural networks, to the graph domain is currently the next big era in graph-based pattern recognition. Actually, graph neural networks for directed acyclic graphs have been proposed about twenty years ago. In the last decade, several variants of Graph Neural Networks such as

Graph Convolutional Network (GCN), Graph Attention Network (GAT), or Graph Recurrent Network (GRN) have demonstrated superior performance in diverse learning tasks on graphs.

This talk is concerned with structural pattern recognition with a strong focus on graph-based data representations. In particular, we review in detail the three major eras outlined above and discuss open research problems in the area of graph-based pattern recognition.

Biography: Kaspar Riesen is a docent at the University of Bern, Switzerland and a professor at the University of Applied Sciences and Arts Northwestern Switzerland. He has a strong expertise in graph based representation in pattern recognition and related fields. He co-authored more than 65 conference papers and book chapters, 26 journal articles, and five monographs. One of my monographs has become a standard textbook on graph edit distance, that is regularly used in lectures. Research projects comprise, for instance, novel interaction models with large information bases, pioneering ways of document analysis (e.g., keyword spotting), and novel algorithms for intelligent data analysis using graphs. He presented various efficient graph matching procedures, one of which has become one of the most widely used algorithms in the field of graph-based data analysis. He co-introduced a generalized form of graph isomorphism that is particularly well suited for information retrieval from graphs (some of the proposed concepts have been implemented in commercial software products). He is also one of the co-responsible researchers behind histograph.ch and the IAM Graph Database (graph benchmark data sets for various applications).



Kaisa Miettinen

Multiobjective Optimization Group, Faculty of Information Technology, University of Jyväskylä, Finland

Title: Some Perspectives to Interactive Evolutionary Multiobjective Optimization Methods.

Abstract: Solving multiobjective optimization problems means finding the best possible solution in the presence of several, conflicting objectives. Because of the conflict, we have a set of Pareto optimal solutions with different trade-offs, where improving any objective function value implies impairment in at least one of the others. To identify the final solution that can be implemented in practice, we need some additional information. Typically, we incorporate preference information from a decision maker, an expert in the problem domain to find the most preferred Pareto optimal solution.

Multiobjective optimization methods can be classified according to the role of the decision maker in the solution process. We review the strengths and weaknesses of different classes and focus on interactive methods, where the decision maker actively directs the solution process with one's preferences. In this way, the DM can learn about the interdependencies among the conflicting objectives and the feasibility of the preferences, and adjust them whenever needed. The decision maker can, thus, concentrating on such solutions that seem most promising, which keeps the cognitive load limited, and eventually gain confidence on the most preferred solution found. At the same time, computational resources are saved when only solutions of interest are generated. Developing interactive methods has a long history in the multiple criteria decision making field but they have received less attention in the evolutionary community. We discuss some findings of a survey on decomposition-based interactive evolutionary methods as well as challenges of developing interactive evolutionary methods. We can hybridize elements of different methods to benefit from their strengths and overcome weaknesses. In this spirit, we also present some interactive multiobjective optimization methods that utilize evolutionary approaches. Finally, we discuss some experiences in solving real problems and introduce briefly the open-source software framework DESDEO devoted to interactive methods.

Biography: Kaisa Miettinen is Professor of Industrial Optimization at the University of Jyväskylä. Her research interests include theory, methods, applications and software of nonlinear multiobjective optimization including interactive and evolutionary approaches. She heads the Research Group on Multiobjective Optimization and is the director of the thematic research area called Decision Analytics utilizing Causal Models and Multiobjective Optimization (DEMO, www.jyu.fi/demo). She has authored over 200 refereed journal, proceedings and collection papers, edited 18 proceedings, collections and special issues and written a monograph Nonlinear Multiobjective Optimization. She is a member of the Finnish Academy of Science and Letters, Section of Science and has served as the President of the International Society on Multiple Criteria Decision Making (MCDM). She belongs to the editorial boards of seven international journals and the Steering Committee of Evolutionary Multiobjective Optimization. She has previously worked at IIASA, International Institute for Applied Systems Analysis in Austria, KTH Royal Institute of Technology in Stockholm, Sweden and Helsinki School of Economics, Finland. She has received the Georg Cantor Award of the International Society on MCDM for independent inquiry in developing innovative ideas in the theory and methodology.



Yifei Pu

College of Computer Science, Sichuan University, China

Title: Analog Circuit Implementation of Fractional-Order Memristor: Arbitrary-Order Lattice Scaling Fracmemristor.

Abstract: In this work, based on fractional calculus, the fractional-order memristor, an arbitrary-order fracmemristor, is proposed to be implemented in the form of a lattice scaling analog circuit. Since the concept of the memristor is generalized from the classic integer-order memristor to that of the fractional-order memristor, fracmemristor, it is natural to ponder a challenging theoretical problem to propose a circuit theoretic methodology to achieve an arbitrary-order memristor by using the ordinary memristor and capacitor or inductor in the form of an analog circuit. Motivated by this need, in this work, we propose an interesting analog circuit implementation method of an arbitrary-order memristor. The first step is the proposal for a novel feasible analog circuit implementation of an arbitrary-order lattice scaling fracmemristor. In particular, the hardware achievement of this arbitrary-order lattice scaling fracmemristor is mathematically derived and analyzed in detail. Secondly, the approximation performance, electrical characteristics, especially fingerprint, and analog circuit achievement of an arbitrary-order fracmemristor are analyzed in detail experimentally, respectively. The main contribution of this work is the proposal for the first preliminary attempt of a feasible hardware achievement of an arbitrary-order fracmemristor and for the recognition of the fingerprint of fracmemristor.

Biography: Yi-Fei PU is a Full Professor and Doctoral Supervisor with the College of Computer Science, Sichuan University and is elected into the Thousand Talents Program of Sichuan Province and the Academic and Technical Leader of Sichuan Province. He focuses on the application of fractional calculus to signal processing, image processing, circuits and systems, and machine intelligence.



Patricia MELIN

Tijuana Institute of Technology, Tijuana, Mexico

Title: Hybrid Intelligent Systems based on Neural Networks, Fuzzy Logic and Bioinspired Optimization Algorithms and their application to Pattern Recognition.

Abstract: Hybrid intelligent systems are formed by prudent combinations of intelligent models, such as neural networks, fuzzy models and others, to achieve efficient solutions to real-world problems. The main idea is to take advantage of the main characteristics of the individual models. For example, neural networks are good for learning from training data, while fuzzy logic is good for representing expert knowledge and uncertainty management, and evolutionary computing is good for search and optimization. Pattern recognition is challenging due to its complexity and the uncertainty involved in the inherent decision-making process required for achieving recognition. In our work the proposed approach is to build powerful hybrid intelligent systems for achieving the automated pattern recognition. The proposed hybrid architecture is based on modular neural networks for learning from large datasets. Then for combining the outputs of the modules an integration based on type-2 fuzzy rules is performed for modeling the involved decision-making process, as well as the inherent uncertainty in making the decisions. Finally, evolutionary or bio-inspired optimization techniques are used for optimizing the architectures of the neural networks, as well as the structures of the type-2 fuzzy systems. In addition, applications of type-2 fuzzy systems in pattern recognition and image processing will be used to illustrate the good performance of general type-2 fuzzy logic, as well as comparison with interval type-2 and type-1 fuzzy systems to verify the significant advantage obtained in using general type-2 fuzzy logic. Pattern recognition and image processing problems often have high levels of uncertainty due to noise and changing environments in real world situations and for this reason is a good area for using type-2 fuzzy logic. We believe that the proposed hybrid intelligent approach can also be used for other diagnosis problem in the future.

Biography: Prof. Patricia Melin is a Professor of Computer Science in the Graduate Division, Tijuana Institute of Technology, Tijuana, Mexico, since 1998. In addition, she is serving as Director of Graduate Studies in Computer Science and is head of the research group on Hybrid Neural Intelligent Systems (2000-present). She holds the Doctor in Science degree (Doctor Habilitatus D.Sc.) in Computer Science from the Polish Academy of Sciences. She has also been advisor of more than 90 graduate students in computer science at the Ph.D. and masters levels. Prof. Melin has published nearly 900 publications in indexed journals, book chapters, and conference proceedings, as well as nearly 50 books, and as consequence of this she has achieved more than 19500 citations with an h index of 77 in Google Scholar, and h index of 65 in Scopus. In addition, she has been awarded the Highly Cited Researcher recognition in the area of Computer Science in 2017 and 2018 by Clarivate Analytics-Web of Science because she is in the top 1% cited author in this area. She has also been awarded with the IFSA 2021 Award on Outstanding Applications of Fuzzy Technology for the contribution of Development and Application of Fuzzy Models in Medical Diagnosis and the NAFIPS 2022 K. S. Fu Award for contributions to the North American Fuzzy Information Processing Society. She is past President of NAFIPS (North American Fuzzy Information Processing Society) 2019-2020. Prof. Melin is the founding Chair of the Mexican Chapter of the IEEE Computational Intelligence Society. She is member of the IEEE Neural Network Technical Committee (2007 to present), the IEEE Fuzzy System Technical Committee (2014 to present) and is Chair of the Task Force on Hybrid Intelligent Systems (2007 to present) and she is currently Associate Editor of the Information Sciences Journal, IEEE Transactions on Fuzzy Systems and Journal of Complex and Intelligent Systems. She is member of NAFIPS, IFSA, and IEEE. Her research interests are in Modular Neural Networks, Type-2 Fuzzy Logic, Pattern Recognition, Fuzzy Control, Neuro-Fuzzy and Genetic-Fuzzy hybrid approaches.