# Lecture Notes in Networks and Systems

### Volume 507

#### Series Editor

Janusz Kacprzyk, Systems Research Institute, Polish Academy of Sciences, Warsaw. Poland

#### **Advisory Editors**

Fernando Gomide, Department of Computer Engineering and Automation—DCA, School of Electrical and Computer Engineering—FEEC, University of Campinas—UNICAMP, São Paulo, Brazil

Okyay Kaynak, Department of Electrical and Electronic Engineering, Bogazici University, Istanbul, Turkey

Derong Liu, Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, USA

Institute of Automation, Chinese Academy of Sciences, Beijing, China

Witold Pedrycz, Department of Electrical and Computer Engineering, University of Alberta, Canada

Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland

Marios M. Polycarpou, Department of Electrical and Computer Engineering, KIOS Research Center for Intelligent Systems and Networks, University of Cyprus, Nicosia, Cyprus

Imre J. Rudas, Óbuda University, Budapest, Hungary

Jun Wang, Department of Computer Science, City University of Hong Kong, Kowloon, Hong Kong

The series "Lecture Notes in Networks and Systems" publishes the latest developments in Networks and Systems—quickly, informally and with high quality. Original research reported in proceedings and post-proceedings represents the core of LNNS.

Volumes published in LNNS embrace all aspects and subfields of, as well as new challenges in, Networks and Systems.

The series contains proceedings and edited volumes in systems and networks, spanning the areas of Cyber-Physical Systems, Autonomous Systems, Sensor Networks, Control Systems, Energy Systems, Automotive Systems, Biological Systems, Vehicular Networking and Connected Vehicles, Aerospace Systems, Automation, Manufacturing, Smart Grids, Nonlinear Systems, Power Systems, Robotics, Social Systems, Economic Systems and other. Of particular value to both the contributors and the readership are the short publication timeframe and the world-wide distribution and exposure which enable both a wide and rapid dissemination of research output.

The series covers the theory, applications, and perspectives on the state of the art and future developments relevant to systems and networks, decision making, control, complex processes and related areas, as embedded in the fields of interdisciplinary and applied sciences, engineering, computer science, physics, economics, social, and life sciences, as well as the paradigms and methodologies behind them.

Indexed by SCOPUS, INSPEC, WTI Frankfurt eG, zbMATH, SCImago.

All books published in the series are submitted for consideration in Web of Science.

For proposals from Asia please contact Aninda Bose (aninda.bose@springer.com).

More information about this series at https://link.springer.com/bookseries/15179

Kohei Arai Editor

# Intelligent Computing

Proceedings of the 2022 Computing Conference, Volume 2



Editor Kohei Arai Saga University Saga, Japan

ISSN 2367-3370 ISSN 2367-3389 (electronic) Lecture Notes in Networks and Systems ISBN 978-3-031-10463-3 ISBN 978-3-031-10464-0 (eBook) https://doi.org/10.1007/978-3-031-10464-0

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022, corrected publication 2022

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

## **Editor's Preface**

This edition of the proceedings series, "Intelligent Computing: Proceedings of the 2022 Computing Conference" contains papers presented at the Computing Conference 2022, held virtually on the 14th and 15th of July 2022. We are delighted to announce that the complete conference proceedings were successfully executed through the will and co-operation of all its organizers, hosts, participants and all other contributors.

The conference is held every year since 2013, with an aim to provide an ideal platform for researchers to exchange ideas, discuss on research results and present practical and theoretical applications in areas, such as technology trends, computing, artificial intelligence, machine vision, security, communication, ambient intelligence and e-learning. The proceedings of 2022 conference has been divided into two volumes which cover a wide range of abovementioned conference topics. This year Computing Conference received a total of 498 papers from around the globe, out of which only 179 papers were selected to be published in the proceedings for this edition. All the published papers passed the double-blind review process by an international panel of at least three international expert referees, and the decisions were taken based on the research quality. We are very pleased to report that the quality of the submissions this year turned out to be very high.

The conference brings a single-track sessions covering research papers, posters, videos followed with keynote talks by experts to stimulate significant contemplation and discussions. Moreover, all authors had very professionally presented their research papers which were viewed by a large international audience online. We are confident that all the participants and the interested readers benefit scientifically from this book and will have significant impact to the research community in the longer term.

Acknowledgment goes to the keynote speakers for sharing their knowledge and expertise with us. A big thanks to the session chairs and the members of the technical program committee for their detailed and constructive comments which

vi Editor's Preface

were valuable for the authors to continue improving their papers. We are also indebted to the organizing committee for their invaluable assistance to ensure the conference comes out in such a great success.

We expect that the Computing Conference 2023 will be as stimulating as this most recent one was.

Kohei Arai

# Contents

for Weighted and Signed Networks	1
A Stochastic Modified Limited Memory BFGS for Training Deep Neural Networks  Mahsa Yousefi and Ángeles Martínez Calomardo	9
Enhanced Deep Learning Framework for Fine-Grained Segmentation of Fashion and Apparel	29
Towards Tackling QSAT Problems with Deep Learning and Monte Carlo Tree Search	15
Laplacian Pyramid-like Autoencoder	59
Autonomous Vision-Based UAV Landing with Collision Avoidance Using Deep Learning	79
The Current State of the Art in Deep Learning for Image Classification: A Review	88
Deep Convolutional Neural Networks for COVID-19 Detection from Chest X-Ray Images Using ResNetV2	)6

viii Contents

Deep Neural Networks for Remote Sensing Image Classification Giorgia Miniello, Marco La Salandra, and Gioacchino Vino	117
Linear Block and Convolutional MDS Codes to Required Rate, Distance and Type	129
A Review of Unsupervised Machine Learning Frameworks for Anomaly Detection in Industrial Applications  Usman Ahmad Usmani, Ari Happonen, and Junzo Watada	158
Causal Probabilistic Based Variational Autoencoders Capable of Handling Noisy Inputs Using Fuzzy Logic Rules	190
Multi-Object On-Line Tracking as an Ill-Posed Problem:  Ensemble Deep Learning at the Edge for Spatial Re-identification  Vasanth Iyer and Asif Mehmood	203
An Ensemble-Based Machine Learning for Predicting Fraud of Credit Card Transactions  Tahani Baabdullah, Danda B. Rawat, Chunmei Liu, and Amani Alzahrani	214
Unsupervised Machine Learning Methods for City Vitality Index Jean-Sébastien Dessureault, Jonathan Simard, and Daniel Massicotte	230
Machine Learning of a Pair of Charged Electrically Particles Inside a Closed Volume: Electrical Oscillations as Memory and Learning of System  Huber Nieto-Chaupis	247
Marlo's Networks of Expectations  Marcos Bautista López Aznar, Guillermo Címbora Acosta, and Walter Federico Gadea	257
Complete Blood Analysis: An Android OCR-Based Interpretation Malik Almaliki and Elsayed Atlam	278
Refined Optimal Control Problem and Its Solution Using Symbolic Regression	294
Influences of Coating and Spandex Compositions of Conductive Textiles Used as Strain Sensors Using an Automated Test System Stefan Wohlrab, Phillip Petz, Florian Eibensteiner, and Josef Langer	306
Problem Structuring Combined with Sentiment Analysis to Product-Service System Performance Management  Ingrid Saiala C. S. Feitosa and Luiz Cesar Ribeiro Carpinetti	322

Contents ix

<b>Texture Transfer Attention for Realistic Image Completion</b> Yejin Kim, Manri Cheon, and Junwoo Lee	340
Examining Correlation Between Trust and Transparency with Explainable Artificial Intelligence	353
Utilizing AI in Test Automation to Perform Functional Testing on Web Application	359
On the Modelling of Species Distribution: Logistic Regression Versus Density Probability Function  João Bioco, Paula Prata, Fernando Canovas, and Paulo Fazendeiro	378
Artificial Intelligence Tools for Actuator Fault Diagnosis of an Unmanned Underwater Vehicle Paolo Castaldi, Saverio Farsoni, Massimiliano Menghini, and Silvio Simani	392
Applying the Delphi Method to Measure Enterprise Content  Management Workflow System Performance  Hisham AbouGrad and Jon Warwick	404
A Fuzzy Epigenetic Model for Representing Degradation in Engineered Systems  Maria Seale, R. Cody Salter, Natàlia Garcia-Reyero, and Alicia Ruvinsky	420
A Voting Ensemble Technique for Gas Classification	436
Neural Networks with Superexpressive Activations and Integer Weights	445
Mask Compliance Detection on Facial Images  Lorenzo Garbagna, Holly Burrows, Lakshmi Babu-Saheer, and Javad Zarrin	452
Urban Tree Detection and Species Classification Using Aerial Imagery Mahdi Maktab Dar Oghaz, Lakshmi Babu Saheer, and Javad Zarrin	469
Rectifying Homographies for Stereo Vision: Analytical Solution for Minimal Distortion	484
Statistical Analysis of Electroencephalographic Signals in the Stimulation of Energy Data Visualizations	504

x Contents

GCANet: A Cross-Modal Pedestrian Detection Method Based on Gaussian Cross Attention Network Peiran Peng, Feng Mu, Peilin Yan, Liqiang Song, Hui Li, Yu Chen, Jianan Li, and Tingfa Xu	520
Automatic Classification of Felsic, Mafic, and Ultramafic Rocks in Satellite Images from Palmira and La Victoria, Colombia	531
SHAQ: Single Headed Attention with Quasi-recurrence Sangeet Dandona, Warren Kushner, Nashwin Bharwani, and Ben Schreiber	548
Dynamic Topic Modeling Reveals Variations in Online Hate Narratives Richard Sear, Nicholas Johnson Restrepo, Yonatan Lupu, and Neil F. Johnson	564
An Improved Bayesian TRIE Based Model for SMS Text Normalization Abhinava Sikdar and Niladri Chatterjee	579
Dialog Act Segmentation and Classification in Vietnamese	594
ConDef: Automated Context-Aware Lexicography Using Large Online Encyclopedias	605
On Sensitivity of Deep Learning Based Text Classification Algorithms to Practical Input Perturbations	613
A Survey of Artificial Intelligence Techniques for User Perceptions'  Extraction from Social Media Data  Sarang Shaikh, Sule Yildirim Yayilgan, Erjon Zoto, and Mohamed Abomhara	627
Social Media Self-expression as Form of Coping During the 2020 Pandemic Lockdown Macrina P. Lazo and Christine Diane Ramos	656
Building Wikipedia N-grams with Apache Spark  Armin Esmaeilzadeh, Jorge Ramón Fonseca Cacho, Kazem Taghva,  Mina Esmail Zadeh Nojoo Kambar, and Mahdi Hajiali	672
Selecting NLP Classification Techniques to Better Understand Causes of Mass Killings	685

Contents xi

Sentiment Analysis on Citizenship Amendment Act of India 2019 Using Twitter Data	701
Shreya Vaghasia and Kalpdrum Passi	701
Sentiment Analysis on Depression Detection: A Review	718
Supervised Negative Binomial Classifier for Probabilistic Record	
Linkage	727
A Recipe for Low-Resource NMT	739
Natural Language Processing Using Database Context  Zheni Mincheva, Nikola Vasilev, Anatoliy Antonov, and Ventsislav Nikolov	747
Enriching Contextualized Representations with Biomedical	
Ontologies: Extending KnowBert to UMLS	760
One Step Beyond: Keyword Extraction in German Utilising Surprisal	
from Topic Contexts	774
Language Use and Susceptibility in Online Conversation  Lu Xiao, Qiyi Wu, Sucheta Soundarajan, and Jinfen Li	787
How Does the Thread Level of a Comment Affect its Perceived	
Persuasiveness? A Reddit Study	800
Ultra-Low-Power Range Error Mitigation for Ultra-Wideband	
Precise Localization Simone Angarano, Francesco Salvetti, Vittorio Mazzia, Giovanni Fantin, Dario Gandini, and Marcello Chiaberge	814
The Pareto-Frontier-Based Stiffness of a Controller:  Trade-off Between Trajectory Plan and Controller Design  Zhe Shen and Takeshi Tsuchiya	825
Remote Manipulation of a Robotic Arm with 6 DOF via IBSV Using a	
Raspberry Pi and Machine Vision	845

xii Contents

Dynamic Analysis and Modeling of DNN-Based Visual Servoing  Systems  Petar Durdevic and Daniel Ortiz-Arroyo	855
Implementation of a Balanced and Fluid Movement Six-Legged Spider Robot	868
The Applying of Low Order Frequency-Dependent Components in Signal Processing of Autonomous Mobile Robotic Platforms	882
Run-Time Dependency Graph Models for Independently Developed Robotic Software Components	892
A Raspberry Pi Computer Vision System for Self-driving Cars  Zach Isherwood and Emanuele Lindo Secco	910
Correction to: Intelligent Computing	C1
Author Index	925