2021 IEEE Fourth International Conference on Artificial Intelligence and Knowledge Engineering (AIKE 2021)

Laguna Hills, California, USA
1 – 3 December 2021

IEEE Catalog Number: CFP21P81-POD
ISBN: 978-1-6654-3737-0

Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21P81-POD
ISBN (Print-On-Demand):	978-1-6654-3737-0
ISBN (Online):	978-1-6654-3736-3

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2021 IEEE Fourth International Conference on Artificial Intelligence and Knowledge Engineering (AIKE)

AIKE 2021

Table of Contents

Message from the General Chairs ..... **ix**
Message from the Program Chairs ..... **xi**
Organizing Committee ..... **xii**
Program Committee ..... **xiii**

Session 1: Learning I

Increased Robustness of Object Detection on Aerial Image Datasets using Simulated Imagery 1
Kai Konen (German Aerospace Center (DLR), Germany) and Tobias Hecking (German Aerospace Center (DLR), Germany)

Transfer Learning Operators for Process-Oriented Cases 9
Mirjam Minor (Goethe University Frankfurt, Germany), Miriam Herold (Goethe University Frankfurt, Germany), Julius Rubbe (Goethe University Frankfurt, Germany), Stefan Dufner (Goethe University Frankfurt, Germany), and Georgios Brussas (Goethe University Frankfurt, Germany)

Privacy-Preserving Sharing of Industrial Maintenance Reports in Industry 4.0 17
Hicham Hossayni (Institut Polytechnique de Paris, France), Imran Khan (Schneider-Electric, France), and Noel Crespi (Institut Polytechnique de Paris, France)

On Continuous Integration / Continuous Delivery for Automated Deployment of Machine Learning Models using MLOps 25
Satvik Garg (Jaypee University of Information Technology, India), Pradyumn Pundir (Jaypee University of Information Technology, India), Geetanjali Rathi (Netaji Subhas University of Technology, India), P. K. Gupta (Jaypee University of Information Technology, India), Somya Garg (Deloitte LLC, USA), and Saransh Ahlawat (Deloitte LLC, USA)

Session 2: Knowledge Management

Towards Intelligent Legal Advisors for Document Retrieval and Question-Answering in German Legal Documents 29
Christoph Hoppe (Bielefeld University of Applied Sciences, Germany), David Pelkmann (Bielefeld University of Applied Sciences, Germany), Nico Migenda (Bielefeld University of Applied Sciences, Germany), Daniel Hötte (Bielefeld University of Applied Sciences, Germany), and Wolfram Schenck (Bielefeld University of Applied Sciences, Germany)

Controlled Query Evaluation over Ontologies Through Policies with Numerical Restrictions 33
Gianluca Cima (CNRS & University of Bordeaux), Domenico Lembo (Sapienza University of Rome), Lorenzo Marconi (Sapienza University of Rome), Riccardo Rosati (Sapienza University of Rome), Domenico Fabio Savo (University of Bergamo), and Daniele Sinibaldi (Sapienza University of Rome)

A Survey on Open Set Recognition 37
Atefeh Mahdavi (Florida Institute of Technology, USA) and Marco Carvalho (Florida Institute of Technology, USA)

Cross-Lingual Timeline Summarization 45
Luca Cagliero (Politecnico di Torino), Moreno La Quatra (Politecnico di Torino), Paolo Garza (Politecnico di Torino), and Elena Baralis (Politecnico di Torino)

Integrating a General Search Agent into an Imperative Programming Language 54
James Smith (Arizona State University, USA), Chris Henderson (Arizona State University, USA), and Ajay Bansal (Arizona State University, USA)

Exploring the Roles of Social Media Data to Identify the Locations and Severity of Road Traffic Accidents 62
Sayeed Salam (University of Texas at Dallas, United States), Md Shihabul Islam (University of Texas at Dallas, United States), Fawaz Ahmed (University of Texas at Dallas, United States), Latifur Khan (University of Texas at Dallas, United States), Dohyeoung Kim (University of Texas at Dallas, United States), Nicholas Allo (VisualEarth, United Kingdom), and Ohwofiemu Nwariaku (UT Southwetern Medical Center, United States)

Session 3: Classification

Robustness of Bayesian Neural Networks to White-Box Adversarial Attacks 72
Adaku Uchendu (Pennsylvania State University, USA), Daniel Campoy (Air Force Research Lab, USA), Christopher Menart (Air Force Research Lab, USA), and Alexandra Hildenbrandt (Air Force Research Lab, USA)

A Machine Learning Predictive Model to Classify Severity of Breast Cancer Based on Mammographic Mass Dataset 81
Mahmud Parvez (University of Louisville, USA), Robert B. Eshun (North Carolina A&T State University, USA), Marwan Bikdash (North Carolina A&T State University, USA), and A.K.M. Kamrul Islam (North Carolina A&T State University, USA)

Multi-Class Classification with Asymmetric Error Control for Medical Disease Diagnosis 88
Wasif Bokhari (Arizona State University, USA), James Smith (Arizona State University, USA), and Ajay Bansal (Arizona State University, USA)

Data-Blind ML: Building Privacy-Aware Machine Learning Models Without Direct Data Access 95
Javier Pastorino (University of Colorado, Denver) and Ashis Kumer Biswas (University of Colorado, Denver)

A Survey on State-of-the-art Techniques for Knowledge Graphs Construction and Challenges Ahead 99
Ali Hur (Edith Cowan University, Australia), Naeem Janjua (Edith Cowan University, Australia; Air University, Pakistan), and Mohiuddin Ahmed (Edith Cowan University, Australia)

Audio-Visual Event Localization Based on Cross-Modal Interacting Guidance 104
Qiurui Yue (Communication University of China, China), Xiaoyu Wu (Communication University of China, China), and Jiayi Gao (Communication University of China, China)

Session 4: Learning II

Captcha Recognition Based on Multi-Task Convolutional Neural Network and Active Learning 108
Jucheng Qiu (Communication University of China, China) and Xiaoyu Wu (Communication University of China, China)

Evolutionary Method to Discover Itemsets with Statistically Distinctive Backgrounds 113
Kaoru Shimada (Gunma University, Japan), Takaaki Arahira (Kyushu Institute of Information Sciences, Japan), and Shogo Matsuno (Gunma University, Japan)

QLiG: Query Like a Graph For Subgraph Matching 121
Sumit Purohit (Pacific Northwest National Laboratory, USA), Patrick Mackey (Pacific Northwest National Laboratory, USA), Jeremy D Zucker (Pacific Northwest National Laboratory, USA), Ankur Bohra (Pacific Northwest National Laboratory, USA), Rahul D Deshmukh (Pacific Northwest National Laboratory, USA), and George Chin (Pacific Northwest National Laboratory, USA)

Deep Ensemble Learning Model for Long-Term Travel Time Prediction on Highways 129
Ming-Chu Ho (National Chung Hsing University, Taiwan), Yu-Cing Chen (National Chung Hsing University, Taiwan), Chih-Chieh Hung (National Chung Hsing University, Taiwan), and Hsien-Chu Wu (National Chin-Yi University of Technology, Taiwan)

Epileptic Seizure Detection using EEG Signal Based LSTM Models 131
Md Khurram Monir Rabby (Bangladesh University of Engineering & Technology (BUET), Bangladesh; North Carolina A&T State University, USA), Robert B. Eshun (North Carolina A&T State University, USA), Saeid Belkasim (Georgia State University, USA), and A.K.M. Kamrul Islam (North Carolina A&T State University, USA; Georgia State University, USA)

Time-Frequency Based EEG Motor Imagery Signal Classification with Deep Learning Networks ... 133
Md Khurram Monir Rabby (Bangladesh University of Engineering & Technology, Bangladesh; North Carolina A&T State University, USA), Robert B. Eshun (North Carolina A&T State University, USA), Saeid Belkasim (Georgia State University, USA), and A.K.M. Kamrul Islam (North Carolina A&T State University, USA; Georgia State University, USA)

The Quantum Mechanics Propagator as the Machine Learning Performance in Space-Time Displacements 135
Huber Nieto-Chaupis (Universidad Autónoma del Perú)

Author Index **137**