



Petra Perner (Ed.)

Machine Learning and Data Mining in Pattern Recognition



18th International Conference on Machine Learning and Data Mining, MLDM 2022

New York, USA, July 16-21, 2022

Proceedings

ibai - publishing

Machine Learning and Data Mining in Pattern Recognition, Proceedings, MLDM 2022

Petra Perner

ibai-publishing
Prof. Dr. Petra Perner
PF 30 11 38
04251 Leipzig, Germany
E-mail: info@ibai-publishing.org

P-ISSN 1864-9734
E-ISSN 2699-5220
ISBN 978-3-942952-93-4

www.ibai-publishing.org

ISBN 978-3-942952-93-4



Petra Perner (Ed.)

Machine Learning and Data Mining in Pattern Recognition

18th International Conference on Machine
Learning and Data Mining, MLDM 2022,
New York, USA, July 16-21, 2022
Proceedings

ibai Publishing

www.ibai-publishing.org

Volume Editor

Petra Perner
Institute of Computer Vision and Applied Computer Sciences IBaI
Hertha-Lindner-Str. 10-12
01067 Dresden
E-mail: pperner@ibai-institut.de

The German National Library listed this publication in the German
National Bibliography.
Detailed bibliographical data can be downloaded from <http://dnb.ddb.de>.

ibai-publishing
Prof. Dr. Petra Perner
PF 30 11 38
04251 Leipzig, Germany
E-mail: info@ibai-publishing.org
<http://www.ibai-publishing.org>

Copyright © 2022 ibai-publishing

P-ISSN 1864-9734
E-ISSN 2699-5220
ISBN 978-3-942952-93-4

All rights reserved.
Printed in Germany, 2022

Editorial

The eighteenth event of the International Conference on Machine Learning and Data Mining MLDM was held in New York (www.mldm.de) running under the umbrella of the World Congress “The Frontiers in Intelligent Data and Signal Analysis, DSA2022” (www.worldcongressdsa.com).

At a time when we are still struggling with the corona pandemic, we scientists from different nations have gathered together for a peaceful discourse on an important research focus in the field of data mining and machine learning.

With our conference, we scientists show that we respect the opinions and work of others. That we are ready to consider them peacefully and in friendship under the critical view of the high scientific standards that this conference has.

The International Program Committee has done an excellent and time-consuming job to select the best papers and provide important guidance on the work of the authors. I would like to thank all the members of the Program Committee for their efforts and that you have contributed with your top-class scientific competence.

The best papers are presented at this conference. The acceptance rate is 33%.

Thank you to all the scientists who have participated in this conference with your excellent work.

A special issue will be done after the conference in the Intern. Journal Transactions on Machine Learning and Data Mining (<http://www.ibai-publishing.org/journal/mldm/about.php>).

I would also like to thank those scientists who have participated in the conference with their work and have not been successful. Even if we have rejected work, we hope that the indications of the program committee will encourage you to reconsider your work and that you will perhaps face the critical scientific consideration of your work by the international program committee again next year.

The tutorial days rounded up the high quality of the conference. Researchers and practitioners got an excellent insight in the research and technology of the respective fields, the new trends and the open research problems that we like to study further.

A tutorial on Data Mining and a tutorial on Case-Based Reasoning, were held after the conference.

I also thank the members of the Institute of Computer Vision and applied Computer Sciences, Germany (www.ibai-institut.de), who handled the conference as secretariat. We appreciate the help and understanding of the editorial staff at ibai-publishing house, who supported the publication of these proceedings (<http://www.ibai-publishing.org/html/proceeding.php>).

Last, but not least, we wish to thank all the speakers and participants who contributed to the success of the conference. We hope to see you in 2023 in New York again at the next World Congress on “The Frontiers in Intelligent Data and Signal Analysis, DSA 2023” (www.worldcongressdsa.com), which combines under its roof the following three events: International Conferences Machine Learning and Data Mining, MLDM (www.mldm.de), the Industrial Conference on Data Mining, ICDM (www.data-mining-forum.de), and the International Conference on Mass Data Analy-

sis of Signals and Images in Medicine, Biotechnology, Chemistry, Biometry, Security, Agriculture, Drug Discovery and Food Industry, MDA (www.mda-signals.de), the workshops and tutorials.

July 2022

Petra Perner

**17th International Conference on Machine Learning and
Data Mining MLDM 2022**
www.mldm.de

Program Chair

Petra Perner Institute of Computer Vision and Applied Computer Sciences IBAI, Germany

Program Committee

Piotr Artiemjew	University of Warmia and Mazury in Olsztyn, Poland
Sung-Hyuk Cha	Pace University, USA
Ming-Ching Chang	University of Albany, USA
Mark J. Embrechts	Rensselaer Polytechnic Institute and CardioMag
.....	Imaging, Inc, USA
Youssef Hadi	Ibn Tofail University, Marokko
Robert Haralick	City University of New York, USA
Naman Kapoor	Delhi Technological University, India
Dimitris Karras	Chalkis Institute of Technology, Greece
Adam Krzyzak.....	Concordia University, Canada
Chengjun Liu.....	New Jersey Institute of Technology, USA
Vincent Oria	New Jersey Institute of Technology, USA
Krzysztof Pancierz.	University Rzeszow, Poland
Dan Simovici.....	University of Massachusetts Boston, USA
Agnieszka Wosiak	Lodz University of Technology, Poland

Table of Content

Application of Bayesian STRIM to Datasets Generated via Partial Correspondence Hypothesis <i>Yuichi Kato and Tetsuro Saeki</i>	1
Implementation of Neural Networks to Predict Crop Yield Production in Norwegian Agriculture <i>Rashmi Gupta, Martin Engen, Erik Sandø, Benjamin Lucas Oscar Sjølander, Simon Arenberg, and Morten Goodwin</i>	17
Predicting Student Performance of Online Courses with Deep Learning and NLP from Texts in Portuguese (pt-br) <i>Armando Antonio Guerra Junior and Luciana de Oliveira Rech</i>	33
KCLPruning: A novel Clustering Method on Convolutional Kernels to Accelerate Deep Convolutional Neural Networks <i>Dana Alqemlas and Mohammad Jeragh</i>	47
Ammunition Component Classification Using Deep Learning <i>Hadi Ghahremanzhad, Chengjun Liu, and Hang Shi</i>	63
Feature Extractor Enhancement by Structural Modifications <i>Sijin Ren, Cheryl Li, and Xiao Mei</i>	77
Creating Customers That Never Existed Synthesis of E-commerce Data Using CTGAN <i>Melle Mendikowski and Mattis Hartwig</i>	91
Risky Tackle Detection from American Football Practice Videos using 3D Convolutional Networks <i>Nasik Muhammad Nafi, Scott Dietrich, and William Hsu</i>	105
Analysis of the Behavior of Online Decision Trees Under Concept Drift at the Example of FIMT-DD <i>Marcel Hanitz, Marvin Schöne, Tim Voigt, and Martin Kohlhase</i>	121
Spectrum-Revealing CUR Decomposition for Sparse Matrices <i>Onyebuchi Ekenta and Ming Gu</i>	137
Computing the Collection of Good Models for Rule Lists <i>Kota Mata, Kentaro Kanamori, and Hiroki Arimura</i>	151

Evolutionary Numerical Workflow for Large-Scale Feature-based Remodeling and Shape Optimization <i>Damir Vučina, Milan Ćurković, Ivo Marinić-Kragić</i>	167
Detection of Animated Scenes Among Movie Trailers <i>Irmak Türköz and H. Altay Güvenir</i>	179
Identifying and Analyzing Communities within a Social Network using Automatic Topic Labelling: Application to the Enron Dataset <i>M. Zakaria Kurdi</i>	191
Maize Yield Predictive Models and Mobile-based Decision Support System, for Smallholder Farmers in Africa <i>Chollette Olisah, Lyndon N. Smith and Melvyn L. Smith</i>	207
Global to Multiple Local Rule-based Surrogate Model for Opening the Black Box <i>Shu Zhang, Yue Gao, Jun Sun, Shan Shan Yu and Tetsu Yamamoto</i>	223
Modern CNNs Comparison for Fire Detection in RGB Images <i>Kresimir Vdovjak*, Petar Maric, Josip Balen, Ratko Grbic, Davor Damjanovic, and Matej Arlovic</i>	239
Learning Adversarial Strategies <i>Jia Xu and Michael Spece</i>	255
Traffic Surveillance Video Analytics: A Concise Survey <i>Hadi Ghahremanzhad, Chengjun Liu and Hang Shi</i>	267
Authors Index	283