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Yuxiao Dong · Dunja Mladenić ·
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Machine Learning and Knowledge Discovery in Databases

Applied Data Science Track

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Proceedings, Part IV

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Preface

This edition of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD 2020) is one that we will not easily forget. Due to the emergence of a global pandemic, our lives changed, including many aspects of the conference. Because of this, we are perhaps more proud and happy than ever to present these proceedings to you.

ECML PKDD is an annual conference that provides an international forum for the latest research in all areas related to machine learning and knowledge discovery in databases, including innovative applications. It is the leading European machine learning and data mining conference and builds upon a very successful series of ECML PKDD conferences.

Scheduled to take place in Ghent, Belgium, due to the SARS-CoV-2 pandemic, ECML PKDD 2020 was the first edition to be held fully virtually, from the 14th to the 18th of September 2020. The conference attracted over 1000 participants from all over the world. New this year was a joint event with local industry on Thursday afternoon, the AI4Growth industry track. More generally, the conference received substantial attention from industry through sponsorship, participation, and the revived industry track at the conference.

The main conference programme consisted of presentations of 220 accepted papers and five keynote talks (in order of appearance): Max Welling (University of Amsterdam), Been Kim (Google Brain), Gemma Galdon-Clavell (Eticas Research & Consulting), Stephan Günnemann (Technical University of Munich), and Doina Precup (McGill University & DeepMind Montreal).

In addition, there were 23 workshops, nine tutorials, two combined workshop-tutorials, the PhD Forum, and a discovery challenge.

Papers presented during the three main conference days were organized in four different tracks:

- Research Track: research or methodology papers from all areas in machine learning, knowledge discovery, and data mining;
- Applied Data Science Track: papers on novel applications of machine learning, data mining, and knowledge discovery to solve real-world use cases, thereby bridging the gap between practice and current theory;
- Journal Track: papers that were published in special issues of the journals *Machine Learning* and *Data Mining and Knowledge Discovery*;
- Demo Track: short papers that introduce a new system that goes beyond the state of the art, accompanied with a video of the demo.

We received a record number of 687 and 235 submissions for the Research and Applied Data Science Tracks respectively. We accepted 130 (19%) and 65 (28%) of these. In addition, there were 25 papers from the Journal Track, and 10 demo papers

(out of 25 submissions). All in all, the high-quality submissions allowed us to put together an exceptionally rich and exciting program.

The Awards Committee selected research papers that were considered to be of exceptional quality and worthy of special recognition:

- Data Mining best paper award: “Revisiting Wedge Sampling for Budgeted Maximum Inner Product Search”, by Stephan S. Lorenzen and Ninh Pham.
- Data Mining best student paper award: “SpecGreedy: Unified Dense Subgraph Detection”, by Wenjie Feng, Shenghua Liu, Danai Koutra, Huawei Shen, and Xueqi Cheng.
- Machine Learning best (student) paper award: “Robust Domain Adaptation: Representations, Weights and Inductive Bias”, by Victor Bouvier, Philippe Very, Clément Chastagnol, Myriam Tami, and Céline Hudelot.
- Machine Learning best (student) paper runner-up award: “A Principle of Least Action for the Training of Neural Networks”, by Skander Karkar, Ibrahim Ayed, Emmanuel de Bézenac, and Patrick Gallinari.
- Best Applied Data Science Track paper: “Learning to Simulate on Sparse Trajectory Data”, by Hua Wei, Chacha Chen, Chang Liu, Guanjie Zheng, and Zhenhui Li.
- Best Applied Data Science Track paper runner-up: “Learning a Contextual and Topological Representation of Areas-of-Interest for On-Demand Delivery Application”, by Mingxuan Yue, Tianshu Sun, Fan Wu, Lixia Wu, Yinghui Xu, and Cyrus Shahabi.
- Test of Time Award for highest-impact paper from ECML PKDD 2010: “Three Naive Bayes Approaches for Discrimination-Free Classification”, by Toon Calders and Sicco Verwer.

We would like to wholeheartedly thank all participants, authors, PC members, area chairs, session chairs, volunteers, co-organizers, and organizers of workshops and tutorials for their contributions that helped make ECML PKDD 2020 a great success. Special thanks go to Vicky, Inge, and Eneko, and the volunteer and virtual conference platform chairs from the UGent AIDA group, who did an amazing job to make the online event feasible. We would also like to thank the ECML PKDD Steering Committee and all sponsors.

October 2020

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Contents – Part IV

Applied Data Science: Recommendation

Social Influence Attentive Neural Network for Friend-Enhanced Recommendation	3
<i>Yuanfu Lu, Ruobing Xie, Chuan Shi, Yuan Fang, Wei Wang, Xu Zhang, and Leyu Lin</i>	
Feedback-Guided Attributed Graph Embedding for Relevant Video Recommendation	19
<i>Taofeng Xue, Xinzhou Dong, Wei Zhuo, Beihong Jin, He Chen, Wenhai Pan, Beibei Li, and Xuejian Zhang</i>	
Recommending Courses in MOOCs for Jobs: An Auto Weak Supervision Approach	36
<i>Bowen Hao, Jing Zhang, Cuiping Li, Hong Chen, and Hongzhi Yin</i>	
Learning a Contextual and Topological Representation of Areas-of-Interest for On-Demand Delivery Application	52
<i>Mingxuan Yue, Tianshu Sun, Fan Wu, Lixia Wu, Yinghui Xu, and Cyrus Shahabi</i>	
Strategic and Crowd-Aware Itinerary Recommendation	69
<i>Junhua Liu, Kristin L. Wood, and Kwan Hui Lim</i>	

Applied Data Science: Anomaly Detection

A Context-Aware Approach to Detect Abnormal Human Behaviors.	89
<i>Roghayeh Mojarad, Ferhat Attal, Abdelghani Chibani, and Yacine Amirat</i>	
RADAR: Recurrent Autoencoder Based Detector for Adversarial Examples on Temporal EHR.	105
<i>Wenjie Wang, Pengfei Tang, Li Xiong, and Xiaoqian Jiang</i>	
Self-supervised Log Parsing	122
<i>Sasho Nedelkoski, Jasmin Bogatinovski, Alexander Acker, Jorge Cardoso, and Odej Kao</i>	
Long-Term Pipeline Failure Prediction Using Nonparametric Survival Analysis	139
<i>Dilusha Weeraddana, Sudaraka MallawaArachchi, Tharindu Warnakula, Zhidong Li, and Yang Wang</i>	

Forecasting Error Pattern-Based Anomaly Detection in Multivariate Time Series 157
Seoyoung Park, Siho Han, and Simon S. Woo

Applied Data Science: Web Mining

Neural User Embedding from Browsing Events 175
Mingxiao An and Sundong Kim

6VecLM: Language Modeling in Vector Space for IPv6 Target Generation 192
Tianyu Cui, Gang Xiong, Gaopeng Gou, Junzheng Shi, and Wei Xia

Calibrating User Response Predictions in Online Advertising 208
Chao Deng, Hao Wang, Qing Tan, Jian Xu, and Kun Gai

An Advert Creation System for 3D Product Placements 224
Ivan Bacher, Hossein Javidnia, Soumyabrata Dev, Rahul Agrahari, Murhaf Hossari, Matthew Nicholson, Clare Conran, Jian Tang, Peng Song, David Corrigan, and François Pitié

Estimating Precisions for Multiple Binary Classifiers Under Limited Samples 240
Rahul Tripathi, Srinivasan Jagannathan, and Balaji Dhamodharaswamy

Applied Data Science: Transportation

Automation of Leasing Vehicle Return Assessment Using Deep Learning Models 259
Mohsan Jameel, Mofassir ul Islam Arif, Andre Hintsches, and Lars Schmidt-Thieme

A Route-Affecting Region Based Approach for Feature Extraction in Transportation Route Planning 275
Fandel Lin, Hsun-Ping Hsieh, and Jie-Yu Fang

Real-Time Lane Configuration with Coordinated Reinforcement Learning . . . 291
Udesh Gunarathna, Hairuo Xie, Egemen Tanin, Shanika Karunasekara, and Renata Borovica-Gajic

A Multi-criteria System for Recommending Taxi Routes with an Advance Reservation 308
Jie-Yu Fang, Fandel Lin, and Hsun-Ping Hsieh

Autonomous Driving Validation with Model-Based Dictionary Clustering . . . 323
Etienne Goffinet, Mustapha Lebbah, Hanane Azzag, and Loic Giraldi

Applied Data Science: Activity Recognition

Recognizing Complex Activities by a Temporal Causal Network-Based Model	341
<i>Jun Liao, Junfeng Hu, and Li Liu</i>	
Unsupervised Human Pose Estimation on Depth Images	358
<i>Thibault Blanc-Beyne, Axel Carlier, Sandrine Mouysset, and Vincent Charvillat</i>	
Data Generation Process Modeling for Activity Recognition	374
<i>Massinissa Hamidi and Aomar Osmani</i>	
Mutual Information Measure for Image Segmentation Using Few Labels	391
<i>Eduardo H. Sanchez, Mathieu Serrurier, and Mathias Ortner</i>	

Applied Data Science: Hardware and Manufacturing

FlowFrontNet: Improving Carbon Composite Manufacturing with CNNs	411
<i>Simon Stieber, Niklas Schröter, Alexander Schiendorfer, Alwin Hoffmann, and Wolfgang Reif</i>	
Learning I/O Access Patterns to Improve Prefetching in SSDs	427
<i>Chandranil Chakrabortii and Heiner Litz</i>	
Interpretable Dimensionally-Consistent Feature Extraction from Electrical Network Sensors	444
<i>Laure Crochepierre, Lydia Boudjeloud-Assala, and Vincent Barbesant</i>	
Automatic Remaining Useful Life Estimation Framework with Embedded Convolutional LSTM as the Backbone	461
<i>Yexu Zhou, Michael Hefenbrock, Yiran Huang, Till Riedel, and Michael Beigl</i>	
On-Site Gamma-Hadron Separation with Deep Learning on FPGAs	478
<i>Sebastian Buschjäger, Lukas Pfahler, Jens Buss, Katharina Morik, and Wolfgang Rhode</i>	

Applied Data Science: Spatiotemporal Data

Benchmarking Tropical Cyclone Rapid Intensification with Satellite Images and Attention-Based Deep Models	497
<i>Ching-Yuan Bai, Buo-Fu Chen, and Hsuan-Tien Lin</i>	

Model Monitoring and Dynamic Model Selection in Travel
Time-Series Forecasting. 513
 *Rosa Candela, Pietro Michiardi, Maurizio Filippone,
 and Maria A. Zuluaga*

Learning to Simulate on Sparse Trajectory Data 530
 Hua Wei, Chacha Chen, Chang Liu, Guanjie Zheng, and Zhenhui Li

Learning from Crowds via Joint Probabilistic Matrix Factorization
and Clustering in Latent Space 546
 Wuguannan Yao, Wonjung Lee, and Junhui Wang

Prediction of Global Navigation Satellite System Positioning Errors
with Guarantees 562
 Alejandro Kuratomi, Tony Lindgren, and Panagiotis Papapetrou

Author Index 579