

Preface

We are delighted to introduce the proceedings of the 2015 edition of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, or ECML PKDD for short. This conference stems from the former ECML and PKDD conferences, the two premier European conferences on, respectively, Machine Learning and Knowledge Discovery in Databases. Originally independent events, the two conferences were organized jointly for the first time in 2001. The synergy between the two led to increasing integration, and eventually the two merged in 2008. Today, ECML PKDD is a world-wide leading scientific event that aims at exploiting the synergies between Machine Learning and Data Mining, focusing on the development and application of methods and tools capable of solving real-life problems.

ECML PKDD 2015 was held in Porto, Portugal, during September 7–11. This was the third time Porto hosted the major European Machine Learning event. In 1991, Porto was host to the fifth EWSL, the precursor of ECML. More recently, in 2005, Porto was host to a very successful ECML PKDD. We were honored that the community chose to again have ECML PKDD 2015 in Porto, just ten years later. The 2015 ECML PKDD was co-located with “Intelligent System Applications to Power Systems”, ISAP 2015, a well-established forum for scientific and technical discussion, aiming at fostering the widespread application of intelligent tools and techniques to the power system network and business. Moreover, it was collocated, for the first time, with the Summer School on “Data Sciences for Big Data.”

ECML PKDD traditionally combines the research-oriented extensive program of the scientific and journal tracks, which aim at being a forum for high quality, novel research in Machine Learning and Data Mining, with the more focused programs of the demo track, dedicated to presenting real systems to the community, the PhD track, which supports young researchers, and the nectar track, dedicated to bringing relevant work to the community. The program further includes an industrial track, which brings together participants from academia, industry, government, and non-governmental organizations in a venue that highlights practical and real-world studies of machine learning, knowledge discovery, and data mining. The industrial track of ECML PKDD 2015 has a separate Program Committee and separate proceedings volume. Moreover, the conference program included a doctoral consortium, three discovery challenges, and various workshops and tutorials.

The research program included five plenary talks by invited speakers, namely, Hendrik Blockeel (University of Leuven and Leiden University), Pedro Domingos (University of Washington), Jure Leskovec (Stanford University), Nataša Milić-Frayling (Microsoft Research), and Dino Pedreschi (Università di Pisa), as well as one ISAP +ECML PKDD joint plenary talk by Chen-Ching Liu (Washington State University). Three invited speakers contributed to the industrial track: Andreas Antrup (Zalando and

University of Edinburgh), Wei Fan (Baidu Big Data Lab), and Hang Li (Noah's Ark Lab, Huawei Technologies).

Three discovery challenges were announced this year. They focused on "MoRe-BikeS: Model Reuse with Bike rental Station data," "On Learning from Taxi GPS Traces," and "Activity Detection Based on Non-GPS Mobility Data," respectively.

Twelve workshops were held, providing an opportunity to discuss current topics in a small and interactive atmosphere: "MetaSel - Meta-learning and Algorithm Selection," "Parallel and Distributed Computing for Knowledge Discovery in Databases," "Interactions between Data Mining and Natural Language Processing," "New Frontiers in Mining Complex Patterns," "Mining Ubiquitous and Social Environments," "Advanced Analytics and Learning on Temporal Data," "Learning Models over Multiple Contexts," "Linked Data for Knowledge Discovery," "Sports Analytics," "BigTargets: Big Multi-target Prediction," "DARE: Data Analytics for Renewable Energy Integration," and "Machine Learning in Life Sciences."

Ten tutorials were included in the conference program, providing a comprehensive introduction to core techniques and areas of interest for the scientific community: "Similarity and Distance Metric Learning with Applications to Computer Vision," "Scalable Learning of Graphical Models," "Meta-learning and Algorithm Selection," "Machine Reading the Web - Beyond Named Entity Recognition and Relation Extraction," "VC-Dimension and Rademacher Averages: From Statistical Learning Theory to Sampling Algorithms," "Making Sense of (Multi-)Relational Data," "Collaborative Filtering with Binary, Positive-Only Data," "Predictive Maintenance," "Eureka! - How to Build Accurate Predictors for Real-Valued Outputs from Simple Methods," and "The Space of Online Learning Problems."

The main track received 380 paper submissions, of which 89 were accepted. Such a high volume of scientific work required a tremendous effort by the Area Chairs, Program Committee members, and many additional reviewers. We managed to collect three highly qualified independent reviews per paper and one additional overall input from one of the Area Chairs. Papers were evaluated on the basis of significance of contribution, novelty, technical quality, scientific, and technological impact, clarity, repeatability, and scholarship. The industrial, demo, and nectar tracks were equally successful, attracting 42, 32, and 29 paper submissions, respectively.

For the third time, the conference used a double submission model: next to the regular conference tracks, papers submitted to the Springer journals Machine Learning (MACH) and Data Mining and Knowledge Discovery (DAMI) were considered for presentation at the conference. These papers were submitted to the ECML PKDD 2015 special issue of the respective journals, and underwent the normal editorial process of these journals. Those papers accepted for one of these journals were assigned a presentation slot at the ECML PKDD 2015 conference. A total of 191 original manuscripts were submitted to the journal track during this year. Some of these papers are still being refereed. Of the fully refereed papers, 10 were accepted in DAMI and 15 in MACH, together with 4+4 papers from last year's call, which were also scheduled for presentation at this conference. Overall, this resulted in a number of 613 submissions (to the scientific track, industrial track and journal track), of which 126 were selected for presentation at the conference, making an overall acceptance rate of about 21%.

Part I and Part II of the proceedings of the ECML PKDD 2015 conference contain the full papers of the contributions presented in the scientific track, the abstracts of the scientific plenary talks, and the abstract of the ISAP+ECML PKDD joint plenary talk. Part III of the proceedings of the ECML PKDD 2015 conference contains the full papers of the contributions presented in the industrial track, short papers describing the demonstrations, the nectar papers, and the abstracts of the industrial plenary talks.

The scientific track program results from continuous collaboration between the scientific tracks and the general chairs. Throughout we had the unfaltering support of the Local Chairs, Carlos Ferreira, Rita Ribeiro, and João Moreira, who managed this event in a thoroughly competent and professional way. We thank the Social Media Chairs, Dunja Mladeníć and Márcia Oliveira, for tweeting the new face of ECML PKDD, and the Publicity Chairs, Ricardo Campos and Carlos Ferreira, for their excellent work in spreading the news. The beautiful design and quick response time of the web site is due to the work of our Web Chairs, Sylwia Bugla, Rita Ribeiro, and João Rodrigues. The beautiful image on all the conference materials is based on the logo designed by Joana Amaral e João Cravo, inspired by Porto landmarks. It has been a pleasure to collaborate with the Journal, Industrial, Demo, Nectar, and PhD Track Chairs. ECML PKDD would not be complete if not for the efforts of the Tutorial Chairs, Fazel Famili, Mykola Pechenizkiy, and Nikolaj Tatti, the Workshop Chairs, Stan Matwin, Bernhard Pfahringer, and Luís Torgo, and the Discovery Challenge Chairs, Michel Ferreira, Hillol Kargupta, Luís Moreira-Matias, and João Moreira. We thank the Awards Committee Chairs, Pavel Brazdil, Sašo Džerosky, Hiroshi Motoda, and Michèle Sebag, for their hard work in selecting papers for awards. A special meta thanks to Pavel: ECML PKDD at Porto is only possible thanks to you. We gratefully acknowledge the work of the Sponsorship Chairs, Albert Bifet and André Carvalho, for their key work. Special thanks go to the Proceedings Chairs, Michelangelo Ceci and Paulo Cortez, for the difficult task of putting these proceedings together. We appreciate the support of Artur Aiguzhinov, Catarina Félix Oliveira, and Mohammad Nozari (U. Porto) for helping to check this front matter. We thank the ECML PKDD Steering Committee for kindly sharing their experience, and particularly the General Steering Committee Chair, Fosca Giannotti. The quality of ECML PKDD is only possible due to the tremendous efforts of the Program Committee; our sincere thanks for all the great work in improving the quality of these proceedings. Throughout, we relied on the exceptional quality of the Area Chairs. Our most sincere thanks for their support, with a special thanks to the members who contributed in difficult personal situations, and to Paulo Azevedo for stepping in when the need was there. Last but not least, we would like to sincerely thank all the authors who submitted their work to the conference.

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