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Inductive Logic Programming

29th International Conference, ILP 2019
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Proceedings

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Preface

These proceedings contain all accepted submissions to the conference paper track of the 29th International Conference on Inductive Logic Programming (ILP 2019).¹ ILP is a type of symbolic machine learning in which logic of first or higher order is used to represent both the data and the models (theories) learnt. The main conference was held in Plovdiv, Bulgaria, over three days, 3–5 September 2019, and was followed by two tutorials on 6 September 2019.

The ILP 2019 call for papers solicited several types of submissions. This volume consists of 6 long conference papers of up to 15 pages, as well as 5 shorter, more focused contributions of up to 9 pages. Successful submissions to the journal track of the conference have formed the ILP 2019 special issue of the *Machine Learning Journal*,² which was edited by Dimitar Kazakov and Filip Železný. Eight late-breaking, 4-page long abstracts were presented at the conference, and made available on the White Rose Research Online repository.³ The conference also included invited talks by Atanas Kiryakov and Svetla Boytcheva (Ontotext) on reasoning over knowledge graphs, and Preslav Nakov (QCRI/HBKU) on detecting fake news “before it was written.” Presentations of three previously published articles (*New Generation Computing*, IJCAI 2019, JELIA 2019) completed the picture of current ILP research.

The overall evidence is that the field has been advancing in a number of directions. These include work on formalisms other than the most commonly used Horn-clause subset of first order logic, e.g. the use of second order logic in meta-interpretive learning, learning in description logics, or the efficient use of propositionalization. The statistical relational learning and probabilistic logic programming paradigms have continued to attract attention, and some of the underlying formalisms are being extended to handle a broader range of data types. The common issue of high computational complexity has also been addressed through the use of concurrency or more efficient algorithms underlying the refinement operators. A general recent trend has also been reflected in the application of ILP to Ethics in AI.

Two best student paper awards were awarded to contributions to these proceedings thanks to the generous sponsorship of the Machine Learning Journal. The 2019 ILP best student paper in the short papers (conference track) category was awarded to Yin Jun Phua and Katsumi Inoue’s contribution *Learning Logic Programs from Noisy State Transition Data*. The 2019 ILP best student paper award in the long papers (conference or journal track) category was won by Stefanie Speichert and Vaishak Belle’s contribution *Learning Probabilistic Logic Programs over Continuous Data*. Submissions of the latter type were also eligible for the best paper award, which was sponsored by our publisher, Springer. This award was received by Andrew Cropper and Sophie

¹ <https://ilp2019.wordpress.com>.

² <https://link.springer.com/journal/10994/>.

³ <https://eprints.whiterose.ac.uk/>.

Tourret for their article *Logical Reduction of Metarules*, which appeared in the ILP 2019 special issue of the Machine Learning Journal.

We would like to thank the members of the Organizing Committee, Bisera Stoyanova (Medical University of Plovdiv, Bulgaria), Ivanka Vlaeva (South-West University Neofit Rilski, Bulgaria), and Raina Hadjikinova (University of Food Technologies, Bulgaria) for their tireless support; the Plovdiv University of Food Technologies as represented by its Vice-Rector, Prof. DSc Nikolay Menkov, for hosting the hands-on tutorials; and Ms. Svetla Malinova of the Ramada Plovdiv Triontium Hotel for her professionalism and all-round assistance. The advice of old hands at organizing ILP was very much appreciated, even if occasionally ignored to our own peril. Lastly, but certainly not least, we are grateful to Springer for the sponsorship and editorial support, which, along with the all-important contribution of all authors and reviewers have made these proceedings and the whole conference possible.

September 2019

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