Workshop Notes

10th International Workshop
"What can FCA do for Artificial Intelligence?"
FCA4AI 2022

31st International Joint Conference on Artificial Intelligence
IJCAI-ECAI 2022

July 23 2022

Wien Messe, Vienna, Austria

Editors
Sergei O. Kuznetsov (HSE University Moscow)
Amedeo Napoli (LORIA Nancy)
Sebastian Rudolph (TU Dresden)

http://fca4ai.hse.ru/2022/

Preface

The nine preceding editions of the FCA4AI Workshop showed that many researchers working in Artificial Intelligence are deeply interested by a well-founded method for classification and data mining such as Formal Concept Analysis (see `https://conceptanalysis.wordpress.com/fca/`).

The FCA4AI Workshop Series started with ECAI 2012 (Montpellier) and the last edition was co-located with IJCAI 2021 (Montréal, Canada). The FCA4AI workshop has now a quite long history and all the proceedings are available as CEUR proceedings (see `http://ceur-ws.org/`, volumes 939, 1058, 1257, 1430, 1703, 2149, 2529, 2729, and 2972). This year, the workshop has again attracted researchers from many different countries working on actual and important topics related to FCA, showing the diversity and the richness of the relations between FCA and AI.

Formal Concept Analysis (FCA) is a mathematically well-founded theory aimed at data analysis and classification. FCA allows one to build a concept lattice and a system of dependencies (implications and association rules) which can be used for many AI needs, e.g. knowledge discovery, machine learning, knowledge representation, reasoning, ontology engineering, as well as information retrieval and text processing. Recent years have been witnessing increased scientific activity around FCA, in particular a strand of work emerged that is aimed at extending the possibilities of FCA w.r.t. knowledge processing. These extensions are aimed at allowing FCA to deal with more complex data, both from the data analysis and knowledge discovery points of view. Actually these investigations provide new possibilities for AI practitioners within the framework of FCA. Accordingly, we are interested in the following issues:

- How can FCA support AI activities such as knowledge processing, i.e. knowledge discovery, knowledge representation and reasoning, machine learning (clustering, pattern and data mining), natural language processing, information retrieval...
- How can FCA be extended in order to help AI researchers to solve new and complex problems in their domains, in particular how to combine FCA with neural classifiers for improving interpretability of the output and producing valuable explanations...

The workshop is dedicated to discussion of such issues. This year it can be noticed that researchers are mostly interested in XAI and using FCA for providing explanations in Knowledge Discovery, and also in NLP, which is nowadays a very important line of investigation.

First of all we would like to thank all the authors for their contributions and all the PC members for their reviews and precious collaboration. The papers submitted to the workshop were carefully peer-reviewed by three members of the program committee. Finally, the order of the papers in the proceedings (see page 5) follows the program order (see `http://fca4ai.hse.ru/2022/`).

The Workshop Chairs

Sergei O. Kuznetsov
National Research University Higher School of Economics, Moscow, Russia

Amedeo Napoli
Université de Lorraine, CNRS, Inria, LORIA, 54000 Nancy, France

Sebastian Rudolph
Technische Universität Dresden, Germany

Program Committee

Mehwish Alam (AIFB Institute, FIZ KIT Karlsruhe, Germany)

Gabriela Arevalo (Universidad Austral, Buenos Aires, Argentina)

Jaume Baixeries (UPC Barcelona, Catalunya)

Alexandre Bazin (LIRMM, Université de Montpellier, France)

Karell Bertet (L3I, Université de La Rochelle, France)

Aleksey Buzmakov (HSE University Perm, Russia)

Peggy Cellier (IRISA, Université de Rennes, France)

Miguel Couceiro (LORIA, Université de Lorraine, Nancy France)

Diana Cristea (Babes-Bolyai University, Cluj-Napoca, Romania)

Mathieu D'Aquin (LORIA, Université de Lorraine, Nancy France)

Florent Domenach (Akita International University, Japan)

Elizaveta Goncharova (NRU Higher School of Economics, Moscow, Russia)

Marianne Huchard (LIRMM, Université de Montpellier, France)

Dmitry I. Ignatov (HSE University Moscow, Russia)

Dmitry Ilvovsky (NRU Higher School of Economics, Moscow, Russia)

Mehdi Kaytoue (Infologic, Lyon, France)

Francesco Kriegel (Technische Universität Dresden, Germany)

Leonard Kwuida (Bern University of Applied Sciences, Switzerland)

Florence Le Ber (ENGEES/Université de Strasbourg, France)

Nizar Messai (Université François Rabelais Tours, France)

Rokia Missaoui (UQO University Ottawa, Canada)

Sergei A. Obiedkov (NRU Higher School of Economics, Moscow, Russia)

Jean-Marc Petit (Université de Lyon, INSA Lyon, France)

Uta Priss (Ostfalia University, Wolfenbüttel, Germany)

Christian Sacarea (Babes-Bolyai University, Cluj-Napoca, Romania)

Francisco José Valverde Albacete (Universidad Carlos III de Madrid, Spain)

Renato Vimieiro (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil)

Contents