

CLA 2007
**Fifth International Conference on Concept Lattices and
Their Applications**

Montpellier, October 24-26, 2007

Web site : <http://www.lirmm.fr/cla07>

1 Preface

The Concept lattice and their Applications conference series began as a response to the increasing use of concept lattices in practical applications. These proceedings reflect the diversity of interest in concept lattices by the scientific community with papers ranging from the analysis of algorithms in data mining to teaching mathematics.

CLA is structured as a triple peer-review process : conference paper, presentation and extended journal paper. 48 papers were submitted to CLA2007 and 24 papers were selected for presentation. All papers were peer reviewed by at least 3 members of the program committee with the final decision on acceptance determined from the reviews by the program chairs. Based on the presentation of the final papers, outstanding contributions from this volume will be invited to submit an extended version of their conference paper for a special volume on concept lattice applications for the International Journal of General Systems. These papers will again be peer-reviewed.

We would particularly like to thank the program committee members and reviewers who gave of their time and we extend our thanks to the authors who contributed to this volume.

Finally, we would also like to thank our sponsors, Lirmm, CNRS, Montpellier II University, and Languedoc Roussillon Region.

Jean Diatta, Peter Eklund and Michel Liquiere

2 Table of Contents

Invited Speakers Talk

Approximate clusters and biclusters <i>Boris Mirkin</i>	1
Closure operators and choice operators : a survey <i>Bernard Monjardet</i>	2
Concept Graphs as Semantic Structures for Contextual Judgment Logic <i>Rudolf Wille</i>	3
Papers	
Some variations on Alan Day's algorithm for calculating canonical basis of implications <i>Vincent Duquenne</i>	13
ZART : A Multifunctional Itemset Mining Algorithm <i>Laszlo Szathmary, Amedeo Napoli, Sergei O. Kuznetsov</i>	22
Extensions of Bordat's algorithm for attributes <i>Karell Bertet, Stéphanie Guillas, Jean-Marc Ogier</i>	34
A new concise representation of frequent patterns through disjunctive search space <i>Tarek Hamrouni, Islem Denden, Sadok Ben Yahia, Engelbert Mephu Nguifo</i>	46
An FDP-Algorithm for Drawing Lattices <i>Christian Zschalig</i>	58
What can lattices do for math. teaching & education ? <i>Vincent Duquenne</i>	72
Using Concept Lattices for Visual Navigation Assistance in Large Databases : Application to a Patent Database <i>Jean Villerd, Sylvie Ranwez, Michel Crampes, David Carteret</i>	84
Evaluation of questionnaires supported by formal concept analysis <i>Radim Belohlavek, Vladimir Sklenar, Jiri Zaczal, Erik Sigmund</i>	96
Camelis : Organizing and Browsing a Personal Photo Collection with a Logical Information System <i>Sébastien Ferré</i>	108
Concept Analysis on structured, multi-valued and incomplete data <i>David Grosser, Henri Ralambondrainy</i>	120
Using Lattices for reconstructing stemma <i>Marc Le Pouliquen</i>	132
Consecutive-ones : handling lattice planarity efficiently <i>Elaine m. Eschen, Nicolas Pinet, Alain Sigayret</i>	141
CLANN : Concept Lattice-based Artificial Neural Network for supervised classification <i>Norbert Tsopzé, Engelbert Mephu Nguifo, Gilbert Tindo</i>	153

A proposal of Description Logic on Concept Lattices <i>Nikolay Shilov, Sang Yong Han</i>	165
Horn-Representation of a Concept Lattice <i>Kamel Ben-Khalifa, Susanne Motameny</i>	177
Formal concepts as optimal factors in Boolean factor analysis : implications and experiments <i>Radim Belohlavek, Vilem Vychodil</i>	188
Further Galois Connections between Semimodules over Idempotent Semirings <i>Francisco J. Valverde-Albacete, Carmen Peláez-Moreno</i>	199
Dynamical modification of context for an iterative and interactive information retrieval process on the web <i>Emmanuel Nauer, Yannick Toussaint</i>	213
Use of Model Driven Engineering in Building Generic FCA/RCA Tools <i>Jean-Rémy Falleri, Gabriela Arévalo, Marianne Huchard, Clémentine Nebut,</i>	225
Precalculating component interface compatibility using FCA <i>Gabriela Arévalo, Nicolas Desnos, Marianne Huchard, Christelle Urtado, Sylvain Vauttier</i>	237
SearchSleuth : The Conceptual Neighbourhood of an Web Query <i>Jon Ducrou, Peter Eklund</i>	249
Representing Numeric Values in Concept Lattices <i>John Pfaltz</i>	260
Inducing decision trees via concept lattices <i>Radim Belohlavek, Bernard De Baets, Jan Outrata, Vilem Vychodil</i>	270
Policies Generalization in Reinforcement Learning using Galois Partitions Lattices <i>Marc Ricordeau, Michel Liquière</i>	282

3 Organization

Steering Committee

Radim Belohlavek	U.S.A
Sadok Ben Yahia	Tunisia
Engelbert Mephu Nguifo	France
Vaclav Snasel	Czech Republic

Program co-chairs

Jean Diatta	France
Peter Eklund	Australia

Program committee

Radim Belohlavek	U.S.A
Claudio Carpineto	Italy
Samir Elloumi	Tunisia
Mohamed Gammoudi	Tunisia
Robert Godin	Canada
Marianne Huchard	France
Ali Jaoua	Qatar
Stanislav Krajci	Slovakia
Sergei Kuznetsov	Russia
Bruno Leclerc	France
Michel Liquiere	France
Mondher Maddouri	Tunisia
Rokia Missaoui	Canada
Amedeo Napoli	France
Sergei Obiedkov	Russia
Uta Priss	Scotland
Henri Ralambondrainy	France
Yahya Slimani	Tunisia
Gerd Stumme	Germany
Petko Valtchev	Canada
Vilem Vychodil	Czech Republic
Mohammed Zaki	U.S.A

External reviewers

Benjarath Phoophakdee	U.S.A
Mohamed Quafafou	France

Organization Chair

Michel Liquière	Lirmm, France
-----------------	---------------

Organization Committee

Celine Berger	Lirmm, France
Jean-Remy Falleri	Lirmm, France
Marianne Huchard	Lirmm, France
Chedy Raissi	Lirmm, France