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Deontic Logic in Computer Science

11th International Conference, DEON 2012
Bergen, Norway, July 16-18, 2012
Proceedings

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Preface

This book comprises the formal proceedings of the 11th International Conference on Deontic Logic in Computer Science held during July 16–18, 2012, at the University of Bergen, Norway. The biennial DEON conferences are intended to promote interdisciplinary cooperation amongst scholars interested in linking the formal-logical study of normative concepts and normative systems with computer science, artificial intelligence, philosophy, organization theory, and law. There have been ten previous DEON conferences: Amsterdam, December 1991; Oslo, January 1994; Sesimbra, January 1996; Bologna, January 1998; Toulouse, January 2000; London, May 2002; Madeira, May 2004; Utrecht, July 2006; Luxembourg, July 2008; Fiesole July 2010.

The topics solicited for DEON 2012 included the following general themes:

- The logical study of normative reasoning, including formal systems of deontic logic, defeasible normative reasoning, logics of action, logics of time, and other related areas of logic
- The formal analysis of normative concepts and normative systems
- The formal specification of aspects of norm-governed multi-agent systems and autonomous agents, including (but not limited to) the representation of rights, authorization, delegation, power, responsibility, and liability
- Normative aspects of protocols for communication, negotiation, and multi-agent decision making
- The formal representation of legal knowledge
- The formal specification of normative systems for the management of bureaucratic processes in public or private administration
- Applications of normative logic to the specification of database integrity constraints

The special theme of DEON 2012 was “Deontic Logic and Social Choice.” Topics of interest for this special theme include:

- Normative system selection and optimization
- Merging and aggregating norms
- Compliance and enforcement strategies for norms
- Game theoretic aspects of deontic reasoning
- Norms, culture, and shared values
- Violation detection and norm creation mechanisms
- Simulation of dynamics in normative systems
- Norm emergence
- Norm change

For DEON 2012 we received 34 abstracts, reviewed 29 papers, and accepted 15 of them for publication in the proceedings and for presentation at the conference.

One paper was retracted because it was impossible for the author to attend the conference. The four invited speakers were chosen in line with the special theme of the current edition of the conference. The first invited speaker was Christian List from the London School of Economics who specializes in social choice theory and the philosophy of collective agency. The second invited speaker was Fabrizio Cariani. His talk was titled “From Floating Conclusions to the Doctrinal Paradox (and Back Again)” and the content of his presentation is described by the following abstract:

In this talk, I explore structural connections between a problem in the formal theory of reasons and a problem in social choice theory. The problem in the theory of reasons, specifically in the theory of defeasible inheritance nets, is the floating conclusions problem. On the social choice theory side, specifically in judgment aggregation, the problem is the doctrinal paradox. Several authors have noticed the tight structural similarity between these problems but there are, to my knowledge, no systematic investigations of their relation.

First, I look at Doctrinal Paradox using the lens theory of reasons articulated by Horty’s Reasons as Defaults. Although the Doctrinal Paradox is often presented as a problem about reason-based group choice, reasons properly understood are conspicuously absent from the formal framework in which the problem is analyzed. I show how one can inject a formal theory of reasons into the judgment aggregation model (highlighting some challenges that arise along the way).

This injection does not open up a way out of the original impossibility results in Judgment Aggregation: under the Independence assumption, there are no significant differences between the old framework and the new. However, a number of authors have been willing to relax Independence and I argue that, once we make this move, there are benefits to be reaped by adopting a dedicated model of reasons.

In the second half of the talk, I take the opposite approach and investigate what the methods and results of Social Choice theory and Judgment Aggregation can teach us about the Floating Conclusion problem. I use the axiomatic approach from social choice theory (sans Independence) to partition the space of possible reasoning policies in the face of the Floating Conclusion problem and to characterize a couple of unexplored options.

The third invited speaker was Davide Grossi. His presentation was titled “Priority Structures in Deontic Logic” and is described by the following abstract:

In this talk I will try to pull together the Hansson tradition in deontic logic with recent developments in the logic of preference and in logical dynamics. I will look at the ideality orderings underpinning Hansson conditionals as generated by syntactic orderings on properties (so-called priority graphs). I will take priority graphs as a viable abstract representation of ‘norms’ intended as what determines ideality orderings, and hence as what determines the truth and falsity of deontic statements.

I will show how priority graphs can be manipulated in order to reason about the normative consequences of changing circumstances, how they can be modified in order to alter their content, and how different graphs can be combined and merged. All these operations can be shown to match corresponding operations at the semantic level of ideality orderings, which naturally relate to many results in the recent literature on dynamic (epistemic) logic. This broad repertoire of operations on priority graphs offers a rich toolbox from which to look at topics—currently much debated—such as norm dynamics.

The proposal I present in this talk has roots that go deep in the literature of deontic logic, relating to many past contributions. Throughout the talk I will take care of referring to standard benchmark examples, problems, and techniques (e.g., CTDs, the Kanger–Anderson reduction, strong permission) in order to appropriately put my contribution into perspective.

The talk is based on recent joint work with Johan van Benthem (University of Amsterdam and Stanford University) and Fenrong Liu (Tsinghua University).

The fourth and final invited speaker was John Horty. The title of his contribution was “Common Law Reasoning” and dealt with the subject described in the following abstract.

I will present two simple models of the process and point of common law reasoning, the “reason model” and the “rule model,” and highlight the advantages of the reason model. Although this work is aimed at resolving issues in legal theory, it bears on several topics from DEON 2012’s special theme: norm change, norm aggregation, and the emergence of norms.

We want to thank all the invited speakers for bringing together such a fascinating and coherent collection of subjects, and for their willingness to contribute to DEON. We are also grateful to the participants of DEON 2012 and to all the authors who submitted papers. Special words of gratitude go to the members of the Program Committee who took their duty very seriously, which resulted in each paper being evaluated with three elaborate reviews. This ensured the authors of accepted papers got valuable input for preparing their final versions and authors of rejected papers received good directions for adapting their work in order to be more successful with future submissions. Finally we are indebted to Springer, and Alfred Hofmann and Anna Kramer in particular, for their support in getting these proceedings published.

May 2012

Thomas Ågotnes
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