

## DYNAMICS IN LOGIC

### INTRODUCTION

The selection of papers brought together in this special issue on “dynamics in logic” is based on talks that were given at the Dynamics in Logic Workshops held at the Vrije Universiteit Brussel on May 3rd 2011 and the Université Lille III on May 1st 2012, complemented with two more papers that were solicited by the editors.

By the expression “dynamics in logic,” we refer to an approach to logic that is characterised by two important shifts, namely (i) the move from a single-agent perspective to a multi-agent perspective on knowledge and belief, and (ii) the use of logical methods and tools that give dynamic processes a central place. These developments lead to new formal challenges as well as to novel applications of logical methods. The range of papers in this volume specifically cover applications that are related to agency and rationality, as well as formal challenges of a proof-theoretical nature.

Andersen, Bolander & Jensen propose a further development of logical systems that are designed to deal with the problem of planning under uncertainty, and rely on recent work in (soft) dynamic epistemic logics to achieve their stated goal of providing a more realistic account of planning.

In his paper, Lorini devises a multi-agent logical system with a focus on moral agency, and therefore uses epistemic (knowledge, choice, preference), moral (moral values), and strategic (coordinated action, coalitions) concepts.

Magnier and de Lima explore a dialogical approach to public announcement logics with common knowledge, and thereby do not only provide a proof-system for these logics, but also connect the dialogical perspective on logic with the standard model-theory of dynamic epistemic logics.

For his analysis of the concept of ‘surprise,’ Demey starts from insights in cognitive science, and AI, and goes on to develop a new formal characterisation of surprise that is based on probabilistic dynamic logics.

The paper by Poggiolesi and Hill takes up the challenge of providing a finitary approach to the proof-theoretical characterisation of common knowledge, which is itself an inherently infinitary notion.

Finally, the contribution by Strasser and Van De Putte dedicated to a family of logics for defeasible inference is as much concerned with the question of how one should reason under uncertainty, as with the proof-formats that can be used to explicate these reasoning-processes.

By bringing together different, but closely related perspectives on dynamic processes, we do not only want to illustrate the common concerns of agency, rationality and uncertainty, but we also wanted to emphasise that while many of these concerns find their origin in philosophical logic, their development and elaboration has for many years been a shared enterprise with computer science. In this special issue (and also in the workshops) we chose to reflect this double nature by including contributions from both areas.

To bring this introduction to a close, we would like to thank T. de Lima and S. Magnier for organising the second workshop at the Université Lille III, all the referees who have kindly accepted the arduous task of evaluating several papers, and finally the Research Foundation (FWO-Vlaanderen) and Tiago de Lima's CNRS-Higher Education chair for financial support.

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