

# Preface

The work presented in this book stems from a collaboration between ILOG and the University of Freiburg, Germany. ILOG was a French software company, founded in 1987 as a spin-off of INRIA, a French national research institution. ILOG quickly became a leader in artificial intelligence software and contributed to define the market of Business Rules Management Systems with its flagship product ILOG JRules. ILOG was acquired by IBM in 2009; IBM continues to develop and sell ILOG's Business Rules Management System under the name IBM Operational Decision Manager.

In 2002, ILOG decided to investigate the field of formal verification of programs and how it could give birth to useful features in its Business Rules Management System. To this effect, a partnership was established with Prof. Podelski, then at the Max-Planck-Institut für Informatik in Saarbrücken, and now at the Albert-Ludwigs-Universität Freiburg. As part of this partnership, it was proposed to me to further explore and formalize some of the scientific aspects of the project, in the form of a Ph.D. thesis, which I defended in Freiburg in July 2012.

The content of this book originates mostly from this Ph.D. thesis. The work in the thesis proposes an approach to the formal verification of rule programs as found in Business Rules Management Systems. The approach enables rule authors and tool developers to understand, express formally, and prove properties of the execution behavior of business rules programs. However, this work only represents a possible starting point for the further development of scientific results, verification algorithms, or product features. The purpose of this book is thus to provide an enabling framework for treating business rules as a topic of scientific investigation in semantics and program verification.

## Acknowledgments

I carried out the research on which this book is based as a remote-working student, first of the Max-Planck Institut für Informatik of Saarbrücken, and then of the Institut für Informatik of the Albert-Ludwigs-Universität in Freiburg. At the same

time I was a software engineer at ILOG, and then at IBM after this company acquired ILOG. My thanks go to Nitsan Seniak for proposing to me the subject of rule program verification within ILOG; to Hassan Aït-Kaci for establishing the connection with Andreas Podelski; and to Andreas Podelski, my supervisor, for suggesting that I should reify our thoughts as a Ph.D. thesis and for his support and guidance throughout the years. It has also been an honor for me to count Prof. Georg Lausen as the Zweitgutachter, as well as Prof. Bernhard Nebel and Prof. Peter Thiemann as the members of my defense committee.

Achieving the present work in an industrial environment would not have been possible without the initial agreement of Jean-François Abramatic, and overall the creativity in management demonstrated by Nitsan Seniak and Antoine Melki. More generally, I would like to thank the members of the “BEAR R&D Governance” team within ILOG for their patience.

Substantial advances in this work were achieved during a 6-month period spent in the Modélisation et Vérification team of the LIAFA laboratory of Université Paris Diderot. I am most grateful to Ahmed Bouajjani for welcoming me. This stay was a major step for me, thanks to the friendly atmosphere and stimulating discussions. My thoughts go to Mihaela Sighireanu, Tayssir Touili, Cezara Drăgoi, Constantin Enea, Mathilde Bouvel, and Ahmed Rezine, as well as the whole “Vérif” team.

Within ILOG I have also benefited from enriching conversations and exchanges. I was nurtured by the RVS project, which included Hassan Aït-Kaci, Ulrich Junker, Michel Leconte, and Andreas Podelski; by the proofreading and most relevant comments of Hassan, Michel, Philippe Bonnard, and Hélène Kencker; and by fruitful discussions with Hugues Citeau, Amina Chniti, Aurélie Baton, Marie Girard, and Philippe Laborie. Very special thanks are deserved by Michel for his continuous support, sustained stimulation, and for the demand for accuracy inherited from my father.

During the long process that my Ph.D. thesis has represented for me, the right words were found on several occasions by Ulrich Junker and Claire David to help me find the required energy. Turning the thesis into a book was possible thanks to Andreas Podelski, again, as well as Ronan Nugent and the staff from Springer-Verlag. Special thanks go to Pierre Haren, who did not hesitate before agreeing to write the Foreword.

Last, but far from least, I am specially grateful to my wife and children for their support and their care.

Paris, France  
January 2013

Bruno Berstel-Da Silva

Verification of Business Rules Programs

Berstel-Da Silva, B.

2014, XVII, 236 p. 18 illus., 2 illus. in color., Hardcover

ISBN: 978-3-642-40037-7