

Bidirectional Transformations (Bx 2015) Special Section: Editorial

Alcino Cunha^a Ekkart Kindler^b

- a. INESC TEC and Universidade do Minho, Portugal
- b. Technical University of Denmark (DTU), Denmark

This Special Section of the Journal of Object Technology (JOT) contains three selected papers from the Fourth International Workshop on Bidirectional Transformations (Bx 2015), which was held in L'Aquila, Italy, on July 24, 2015, co-located with STAF (Software Technologies: Applications and Foundations). These papers were extended after the event, taking the discussions at Bx 2015 into account, and then underwent a careful reviewing and revision process (each paper was reviewed by three peers).

Bidirectional Transformations (Bx) are a mechanism for maintaining the consistency of at least two related sources of information. Such sources can be relational databases, software models and code, or any other document following standard or ad-hoc formats. Bx are an emerging topic in a wide range of research areas, with prominent presence at top conferences in several different fields (namely databases, programming languages, software engineering, and graph transformation), but with results in one field often getting limited exposure in the others. The International Workshops on Bidirectional Transformations are annual events created for promoting cross-disciplinary research and awareness in the area. As such, since its beginning in 2012, the workshops rotate between venues in different fields. In 2015, Bx was co-located with STAF for the first time.

The three selected papers (out of seven papers that were presented at Bx 2015) are:

1. Faris Abou-Saleh, James McKinna, and Jeremy Gibbons: *Coalgebraic Aspects of Bidirectional Computation*.
2. Michael Johnson and Robert Rosebrugh: *Symmetric Delta Lenses and Spans of Asymmetric Delta Lenses*.
3. James Cheney, Jeremy Gibbons, James McKinna, and Perdita Stevens: *On Principles of Least Change and Least Surprise for Bidirectional Transformations*.

These papers explore the foundations of Bx and will be a formal mathematical basis for Bx for years to come. The first two papers present unified theories of Bx, and are part of an ongoing community effort to understand the differences and similarities between the many Bx formalisms that have been proposed in recent years. To develop

such unified theories, they rely on different mathematical structures: the first develops a coalgebraic treatment of state-based Bx, while the second resorts to the category theory concept of span to relate symmetric and asymmetric delta lenses. The third paper sheds new light on a fundamental Bx problem: when consistency between artifacts can be restored in more than one way, which are the principles determining the "best" choice for restoring consistency again? Altogether, we believe that these papers are interesting and relevant for a broader audience.

We would like to thank all the people who directly or indirectly contributed to this Special Section: the authors, the reviewers of the workshop papers, the participants of the workshop (for asking interesting questions and giving hints for improving the papers), and the reviewers of the revised and extended versions submitted for this Special Section of JOT (for their very detailed reviews and suggestions that helped improving the selected papers). Not least, we would like to thank the JOT editorial board and Alfonso Pierantonio for their support with publishing this Special Section.