

Abstract

# On the Construction of Translation in Partial Bidirectionalization

SOICHIRO HIDAKA<sup>1,a)</sup> MASSIMO TISI<sup>2</sup>

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Bidirectional transformation (BX) has been extensively studied across different disciplines such as databases, software engineering, programming languages and graph transformations, as the potential applications of synchronizing various data sources are ubiquitous. While many natively bidirectional transformation languages are proposed, bidirectionalizing unidirectional transformation (UX) languages would facilitate seamless transitions from unidirectional to bidirectional transformation, especially from programmers' perspective. In our previous work, we have proposed a general framework of partially translating UX languages to BX ones to fully maintain the expressive power of the UX languages while allowing backpropagable updates on a part of target models. However, alignment of UX and BX languages is far from trivial. In particular, how to come up with such translation was not systematically discussed. In this presentation, by making use of modularity of source and target languages which we formalized as additivity in our another previous work, we propose a systematic approach to constructing partial translation. In an additive transformation language, sequences of language constructs at different level of well-defined syntactic hierarchy in a transformation can be shorten to produce smaller outputs. Once such properties are exploited in both source and target languages, translator can be naturally constructed by following such syntactic structures. Monoid structures in both languages are utilized in such construction.

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<sup>1</sup> Faculty of Computer and Information Sciences, Hosei University, Koganei, Tokyo 184-8584, Japan

<sup>2</sup> IMT Atlantique, Department of Automatic Control and Production Systems and IT, IMT Atlantique, Nantes, Loire-Atlantique 44307 France

<sup>a)</sup> hidaka@hosei.ac.jp