Flexibility, Configurability and Optimality in UNL Deconversion via Multiparadigm Programming

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Abstract. The fulfillment of the UNL vision is primarily conditioned on the successful deployment of deconverters, each translating from the UNL into a target language. According to current practice, developing deconverters ultimately means configuring DeCo, the deconversion engine provided by the UNDL Foundation. However, DeCo has a number of limitations that hinder productivity and might even preclude quality deconversion. This paper discusses some of these shortcomings and introduces an alternative deconversion model – Manati, which is the result of work on UNL-mediated Portuguese-Brazilian Sign Language human-aided machine translation. With Manati we attempt to exemplify how multiparadigm – namely, constraint, object-oriented and higher-order – programming can be drawn upon not only to specify an open-architecture, optimum-searching deconversion engine but also and above all to rationalize its configuration into deconverters for target languages.

1 Introduction

The fulfillment of the UNL vision [10, 11, 18] is primarily conditioned on the successful deployment of deconverters, each translating from the UNL into a target language. UNL deconversion is actually an instance of Natural Language Generation (NLG), which refers to rendering linguistic form to input in a non-linguistic representation. As pointed out by e.g. Reiter & Dale [13], Cahill & Reape [3], and Paiva [12], NLG can be a very complex task involving processing both linguistic (e.g. lexicalization, aggregation and referring expression generation) and otherwise (e.g. content selection and layout planning). The good news is that UNL deconversion is in fact restricted to the linguistic aspect of NLG, which can be termed **linguistic realization** and comprises the usual macro-level tasks of microplanning and surface realization. Therefore, one should naturally expect UNL deconversion to benefit from recent advances in Natural Language Generation and software development practice, for which reason UNL developers may need to go beyond the model underlying the DeConverter – or simply DeCo, the generic deconversion engine provided by the UNDL foundation.

In this paper we analyze DeCo both as a formal object and a software product, with an emphasis on discussing DeCo's features that may hinder productivity. In this analysis we adopt configurability (i.e. ease of configuration into full-fledged decon-

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