

NdE - Normalization during Extraction

Mircea-Dan Hernest¹

Laboratoire d'Informatique (LIX)
École Polytechnique
F-91128 Palaiseau - FRANCE
`danher@lix.polytechnique.fr`

We present a methodology for improving the implementation of the **NbE** (Normalization by Evaluation) normalization algorithm [1, 2] in *call-by-value* functional programming languages like SCHEME [3]. Such optimizations are meant to heavily (at least from an empirical, observational viewpoint) decrease the run-time complexity of the NbE-normalization of long sequences of nested term applications ($\mathbf{t}_n..(\mathbf{t}_2(\mathbf{t}_1\mathbf{t}_0))..$). A situation of this kind occurs for example in the case of the extraction of a *modulus of uniform continuity* for a closed term \mathbf{t} of Goedel's **T** of type $(\mathbb{N} \rightarrow \mathbb{N}) \rightarrow (\mathbb{N} \rightarrow \mathbb{N})$. The aforementioned extraction is by means of Kohlenbach's Monotone functional "Dialectica" Interpretation [4] and proceeds from a proof of the *hereditarily extensional equality* of \mathbf{t} to itself. This example was implemented in the MINLOG proof-system [5], hence a machine DEMONstration will be available for the **NdE** optimization of the call-by-value NbE-normalization.

References

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