Abstract abstractions abstract abstract abstractions abstractly

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Abstract

The abstraction of abstract information is the essence of computation. We abstract, via abstract abstraction, that abstract abstractions exist at multiple levels of abstraction. In this work, we introduce λ^{λ}, a novel meta-abstraction algorithm that abstracts away many of the abstract abstractions that make the traditional process of abstraction so abstract. Ultimately, this work yields a truly abstract view of abstraction that is so abstract as to be, somehow, concrete.

1 Introduction

Abstract abstractions abstract abstractly. To the extent that abstractions can be composed recursively, it follows that abstract abstractions abstract abstract abstractions abstractly. Yet, once abstracted, how do abstractions abstract into abstract form?

2 Background

Abstraction is one of the key abstractions in the field of abstraction, dating back to early abstract work in the field of abstract mathematical logic (Schönfinkel, 1924). In linguistics, syntactic abstraction permits the abstraction of such abstract abstractions as, "Abstractless abstract abstractions abstract abstractly" (Chomsky, 1957). In programming languages, abstract interpretation allows the abstracter to abstract away the messy business of program semantics and ascend an abstract lattice into a sublimely abstract state of abstractful abstraction (Cousot and Cousot, 1977).

3 Methods and Results

We introduce λ^{λ}, a meta-abstraction procedure that abstracts any concrete or abstract syntax tree. At an absract level, λ^{λ} performs the following:

1. Abstract all tree nodes by substituting λ's.
2. Recursively abstract sub-trees via nesting until the desired level of abstraction is reached.

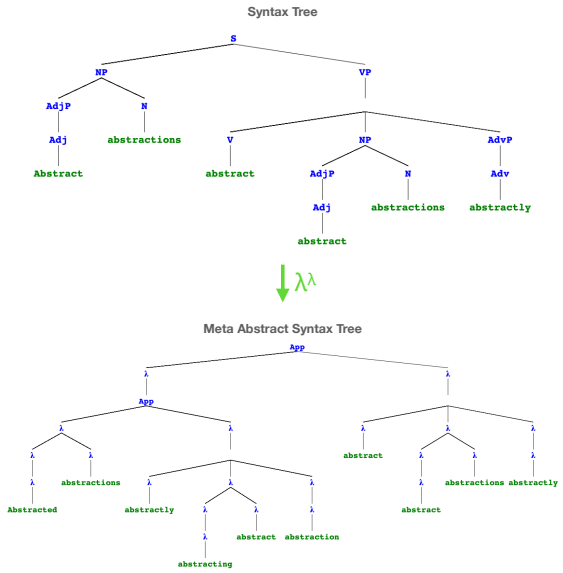

Figure 1: Meta-abstraction via λ^{λ}. All tree nodes are abstracted away with λ's and recursively nested to form new higher-level abstractions.

In our abstract experimental setting, λ^{λ} achieved an abstract level of performance on an array of abstraction tasks. As a concrete example, application of λ^{λ} to the title of this work discovers multiple meta-abstractions, including the past participle ***abstracted***, the gerund ***abstracting***, and the concept of ***abstraction*** itself. The full meta-abstraction (Fig. 1) reads, *"Abstracted abstractions abstractly abstracting abstract abstraction abstract abstract abstractions abstractly."* Remarkably, this phrase is syntactically valid in both English and Haskell (Marlow, 2012). We also experimented with a recursive formulation $\lambda^{\lambda^{\lambda}}$; however, we found results from this approach to be, on the whole, too abstract to be interpretable.

References

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