Yin-Yang: Concealing the Deep Embedding of DSLs

Vojin Jovanovic and Amir Shaikhha

Ecole Polythechnique Federale de Lausanne, EPFL
{first}.{last}@epfl.ch

Abstract. Deeply embedded domain-specific languages (EDSLs) intrinsically compromise programmer experience for improved program performance. Shallow EDSLs complement them by trading program performance for good programmer experience. We present *Yin-Yang*, a framework for DSL embedding that uses Scala macros to reliably translate shallow EDSL programs to corresponding deep EDSL programs. The translation allows program prototyping and development in the user friendly shallow embedding, while the corresponding deep embedding is used where performance is important. On the EDSL author side, Yin-Yang can automatically generate deep EDSL embeddings from their shallow counterparts. This leads to reliability by construction, since the deep and shallow embeddings are provably equivalent. Generating deep embeddings shields the EDSL author from complicated compiler internals and shifts focus on domain-specific optimizations and error-reporting.

Keywords: Embedded Domain-Specific Languages, Macros, Deep Embedding, Shallow Embedding, Compile-Time Meta-Programming

[1]

References

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