

Presentation Abstract

An Extended SECD Machine with a First-class Macro Mechanism

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Landin's SECD machine is known to be a simple but yet expressive abstract machine for functional programming. In this presentation, we propose its extension with a first-class macro mechanism to achieve functional metaprogramming. A novel characteristic of our work is "macro closure", a meta-level (but also first-class) function closure, designed analogously to the closure of lambda abstraction to manipulate program code. As an application, we implement a micro Lisp in the framework of the extended SECD machine with a few primitives. While its core system is surprisingly small, the notion of macro closure allows us to implement a lot of programming language features (conditional expression, recursive function definition, quasi-quotation, etc.) as user-defined programs.

This is the abstract of an unrefereed presentation, and it should not preclude subsequent publication.

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