

# A fresh view of call-by-need

(invited talk abstract)

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Call-by-need is a lazy evaluation strategy which overwrites an argument with its value the first time it is evaluated, thus avoiding a costly re-evaluation mechanism. It is used in functional programming languages like Haskell and Miranda. In this talk we present a fresh view of call-by-need in three different aspects:

We revisit the completeness theorem relating (weak) call-by-need with standard (weak) call-by-name. We relate the syntactical notion of (weak) call-by-need with the corresponding semantical notion of (weak) neededness, based on the theory of residuals. We extend the weak call-by-need strategy, which only computes weak head normal forms of closed terms, to a strong call-by-need strategy which computes strong normal forms of open terms, a notion of reduction which is used in proof assistants like Coq and Agda.

We conclude our talk by proposing some future research directions.