

Quantitative measures for pattern matching

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Abstract

In this talk we explore recent approaches to quantitative typing systems for programming languages with pattern matching features. Quantitative (non-idempotent intersection) types have been used to characterise solvability for a pair pattern calculus, in which a qualitative characterisation of head-normalisation was given by means of typability. We show that one can go further and provide upper-bounds/exact measures for head-normalisation, by means of two resource aware quantitative type systems (system U and system E), which take advantage of specific technical tools. While system U provides upper bounds for the length of head-normalisation sequences and the size of normal forms, system E goes even further and produces exact measures for each of them, as well as discriminating between the different kind of reduction steps performed.

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