Quantitative types for pattern matching with exact bounds

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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 exact measures for head-normalisation, by means of a resource-aware quantitative type system (system E). By using a combination of specific technical tools, system E is able to produce exact measures for bounds for the length of head-normalisation sequences and the size of normal, while also discriminating between the different kinds of reduction steps performed