Quantitative Types: from Foundations to Applications

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Quantitative techniques are emerging in different areas of computer science, such as model checking, logic, and automata theory, to face the challenge of today's resource aware computation.

In this talk we give a clean theoretical understanding of the use of resources in quantitative type systems, and we introduce different alternatives, suitable for a wide range of powerful models of computation, such as for example pattern matching, control operators and infinitary computations.

We survey some interesting results related to those type systems such as (1) characterization of operational properties, (2) computation of exact measures for reduction sequences and normal forms, (3) decidability of inhabitation problems, and (4) proofs of observational equivalence.