Weighted logics for unranked tree automata

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We define a weighted monadic second order logic for unranked trees and the concept of weighted unranked tree automata, and we investigate the expressive power of these two concepts, with the weights being computed in any semiring. We show that weighted tree automata and a syntactically restricted weighted MSO-logic have the same expressive power in case the semiring is commutative or in case we deal only with ranked trees, but, surprisingly, not in general. This demonstrates a crucial difference between the theories of ranked trees and unranked trees in the weighted case. If time permits, we will also consider recent extensions of the weight structures to valuation monoids. These contain all semirings, but also average computations of real numbers as weights, recently considered by Henzinger and others.

References

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