

# CONVERGENCE PROPERTIES OF APPROXIMATING MARKOV DECISION PROCESSES WITH UNBOUNDED JUMP RATES

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Modern queueing applications require allowing the jump rates to be unbounded. This yields a non-uniformisable MDP, to which value iteration cannot be applied. Truncation methods have to be applied, but these generally destroy the structural properties of the optimal policy. Smoothed rate truncation however preserves these. For numerical evaluation of the structural properties of optimal policies, smoothed rate truncation therefore seems a more suitable method than mere truncation. Interestingly, the preservation of structural properties in a value approximation procedure seems to imply certain monotonicity properties of the optimal  $n$ -stage policy as a function of the iteration step  $n$ . We will discuss various examples exhibiting these phenomena as well conditions under which optimal policies and value function for the approximating Markov decision Process converge to the optimal policy and value function of the original process.