NEURAL NETWORKS AND WEIGHTED AUTOMATA

ANDREAS MALETTI

Abstract: We carefully introduce (recurrent) neural networks from the perspective of weighted automata and present several variants that are used in practice. In addition, we investigate the expressive power and the decidability and complexity of several standard operations and compare those results to the corresponding results for weighted automata over the field of rationals or reals. Finally, we introduce a standard procedure for neural network training, which differs significantly from the standard learning techniques for weighted automata over fields.