Summary of paper #8

Reinforcement Learning in System Identification

In this paper, the authors demonstrate the importance of online learning algorithms for system identification, as results coming from offline algorithms are bound on the available data, their quantity and their quality. In this work, an online learning algorithm based on RL using the Temporal Difference (TD) method is presented, for identification purposes. The basic proposition of RL with TD are used and, as a consequence, the linear TD(λ) algorithm is modified and adapted for systems identification and the reinforcement signal is defined according to the temporal difference and the identification error.

The proposed algorithm is applied in the parameters adjustment of a Dynamical Adaptive Fuzzy Model (DAFM). In this case, the prediction function is a non-linear function of the fuzzy model parameters and a non-linear TD(λ) algorithm is obtained for the online adjustment of the DAFM parameters.