

1 Reachability of regular switched linear systems

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Switched linear systems belong to a special class of hybrid control systems which comprises a collection of subsystems described by linear dynamics (differential/difference equations) together with a switching rule that specifies the switching between the subsystems. Such systems can be used to describe a wide range of physical and engineering problems in practice. On the other hand, switched linear systems have been attracting much attention in the recent past years because of the arising problems are not only academically challenging but also of practical importance. In this talk we consider *regular switched sequential linear systems*; that is, sequential switched linear systems

$$\Gamma : \underline{x}(t+1) = A_{\sigma(t)}\underline{x}(t) + B_{\sigma(t)}\underline{u}(t)$$

where the switching signals $\sigma(0)\sigma(1)\sigma(2)\dots \in \Sigma^*$ belong to a regular language $L_\Gamma \subseteq \Sigma^*$ of admissible sequences of commands of system Γ . This is actually equivalent to saying that switching signals are governed by a finite automaton. We study the notion of reachability in terms of families of matrices $A_{\sigma(-)}$ and $B_{\sigma(-)}$ by using linear algebra techniques.