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Stellingen

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Stabilizability and optimal control of switched differential algebraic equations

van

Paul Wijnbergen

1. The system class containing switched DAEs with the same switching sequence is either essentially impulse-uncontrollable or essentially impulse-controllable. (Chapter 3)
2. Impulse-controllability of system classes generated by some matrix triplets and the class of arbitrary switching signals is equivalent to impulse-controllability of all switched DAEs with a single switch contained in the class. (Chapter 3)
3. Controllability, null-controllability and reachability are equivalent concepts for switched DAEs in the behavioral sense. If Dirac impulses are to be avoided this statement does not hold anymore. (Chapter 4)
4. Impulse-free linear quadratic optimal control of a non-switched DAE is equivalent to optimal control of an ODE. (Chapter 5)
5. The linear quadratic optimal control problem of switched DAEs can be regarded as a repeated optimal control problem for non-switched DAEs. (Chapter 5)
6. Existence of an input that solves the LQR problem for switched DAEs can be determined based on a subspace algorithm. (Chapter 5)
7. Impulsive behavior is almost never optimal, although it might make you jump in the right direction.
8. If there is a choice between working a bit longer and going out for a walk, then going out for a walk is almost always the better option.