Integral control of nonlinear systems

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Most of the engineering problems involve the analysis and the control of nonlinear systems. Among the different techniques, integral control has played a central role, being extensively used to achieve robust asymptotic regulation and disturbance rejection for systems with parameter variations. However, when an integrator is present in the control scheme the windup phenomenon can occur, causing long transient and oscillations that could lead the system to instability. My research is oriented on trying to formulate an efficient integral controller with anti-windup scheme. The main applications are on the field of power networks, where nonlinear control problems are usually addressed.

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