# Riccati-Based Feedback Control of Nonlinear Unsteady PDEs

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We discuss the feedback problem for dynamical systems described by a (system of) unsteady partial differential equations, such as nonlinear heat conduction and (reactive) flow problems. Using the linearization principle, such problems can be steered towards equilibrium states using linear-quadratic regulators defined via the solution of algebraic Riccati equations (AREs). Due to the semi-discretization in space, usually achieved by finite element methods, the computational bottleneck then is the solution of the resulting large-scale AREs. We discuss recent developments to solve such problems, and compare their performance using several numerical examples.