Quadratic Optimal Control through Spectral and Coprime Factorization

Olof J. Staffans
Åbo Akademi University
Department of Mathematics
FIN-20500 Åbo, Finland
Olof.Staffans@abo.fi
http://www.abo.fi/~staffans/

We study the infinite horizon quadratic cost minimization problem for a linear time-invariant distributed parameter system with finitely may inputs and outputs. We work in an input/output framework, and reduce the unstable case to the stable case by the use of a right coprime factorization of the impulse response and a preliminary stabilizing feedback. The stable case is then solved through spectral factorization. The theory is illustrated with two examples involving pure time delays.