Kalle Mikkola: *Infinite-Dimensional Linear Systems, Optimal Control and Algebraic Riccati Equations*; Helsinki University of Technology Institute of Mathematics Research Reports A452 (2002).

Abstract: *In this monograph, we solve rather general linear, infinite-dimensional, time-invariant control problems, including the* H^{∞} *and LQR problems, in terms of algebraic Riccati equations and of spectral or coprime factorizations. We work in the class of (weakly regular) well-posed linear systems (WPLSs) in the sense of G. Weiss and D. Salamon.*
Moreover, we develop the required theories, also of independent interest, on WPLSs, time-invariant operators, transfer and boundary functions, factorizations and Riccati equations. Finally, we present the corresponding theories and results also for discrete-time systems.

AMS subject classifications: 42A45, 46E40, 46G12, 47A68, 49J27, 49N10, 49N35, 93-02, 93A10, 93B36, 93B52, 93C05, 93C55, 93D15

Keywords: suboptimal H-infinity control, standard H-infinity problem, measurement feedback problem; H-infinity full information control problem, state feedback problem; Nehari problem; LQC, LQR control, H2 problem, minimization; bounded real lemma, positive real lemma; dynamic stabilization, controller with internal loop, strong stabilization, exponential stabilization, optimizability; canonical factorization, (J,S)-spectral factorization, (J,S)-inner coprime factorization, generalized factorization, J-lossless factorization; compatible operators, weakly regular well-posed linear systems, distributed parameter systems; continuous-time, discrete-time; infinite-horizon; time-invariant operators, Toeplitz operators, Wiener class, equally-spaced delays, Popov function; transfer functions, H-infinity boundary functions, Fourier multipliers; Bochner integral, strongly measurable functions, strong Lp spaces; Laplace transform, Fourier transform

Kalle.Mikkola@hut.fi

ISBN 951-22-6153-7
ISSN 0784-3143
Espoo, 2002

Helsinki University of Technology
Department of Engineering Physics and Mathematics
Institute of Mathematics
P.O. Box 1100, 02015 HUT, Finland
email:math@hut.fi http://www.math.hut.fi/