Table of Contents

Editorial Introduction vii

J.A.Ball, I.Gohberg and M.A.Kaashoek
Nevanlinna-Pick interpolation for time-varying input-output maps: The discrete case 1
0. Introduction 1
1. Preliminaries 4
2. J-Unitary operators on ℓ_2 17
3. Time-varying Nevanlinna-Pick interpolation 27
4. Solution of the time-varying tangential Nevanlinna-Pick interpolation problem . 34
5. An illustrative example 41
References 50

J.A.Ball, I.Gohberg, M.A.Kaashoek
Nevanlinna-Pick interpolation for time-varying input-output maps: The continuous time case 52
0. Introduction 52
1. Generalized point evaluation 55
2. Bounded input-output maps 62
3. Residue calculus and diagonal expansion 65
4. J-unitary and J-inner operators 68
5. Time-varying Nevanlinna-Pick interpolation 76
6. An example 85
References 88

A.Ben-Artzi, I.Gohberg
Dichotomy of systems and invertibility of linear ordinary differential operators 90
1. Introduction 90
2. Preliminaries 94
3. Invertibility of differential operators on the real line 95
4. Relations between operators on the full line and half line 102
5. Fredholm properties of differential operators on a half line 106
6. Fredholm properties of differential operators on a full line 110
7. Exponentially dichotomous operators 113
8. References 118

A.Ben-Artzi and I.Gohberg
Inertia theorems for block weighted shifts and applications 120
1. Introduction 120
2. One sided block weighted shifts 121
3. Dichotomies for left systems and two sided systems 131
4. Two sided block weighted shifts 139

5. Asymptotic inertia 147
6. References 152

P.Dewilde, H.Dym
Interpolation for upper triangular operators 153
1. Introduction 154
2. Preliminaries 164
3. Colligations & characteristic functions 168
4. Towards interpolation 177
5. Explicit formulas for Θ 193
6. Admissibility and more on general interpolation 203
7. Nevanlinna-Pick Interpolation 210
8. Carathéodory-Fejér interpolation 215
9. Mixed interpolation problems 224
10. Examples 226
11. Block Toeplitz & some implications 245
12. Varying coordinate spaces 251
13. References 259

I.Gohberg, M.A.Kaashoek, L.Lerer
Minimality and realization of discrete time-varying systems 261
Introduction 261
1. Preliminaries 264
2. Observability and reachability 268
3. Minimality for time-varying systems 271
4. Proofs of the minimality theorems 274
5. Realizations of infinite lower triangular matrices 278
6. The class of systems with constant state space dimension 285
7. Minimality and realization for periodical systems 292
References 295