Index

Symbols

$H_\infty$-stabilization, 105
$H_\infty$-stabilization, 47, 48

A

d’Alembert
   Method, 202
   Solution, 209
Anti-Windup, 31–34, 36, 37, 39, 40, 44
APIOBPCS, 63
Asymptotic Stability, 146, 162, 164

B

BIBO Stability, 66, 68

C

Catalyst, 174, 175
Compact Attractor, 118, 119
Controller
   internal model control, 32, 44
   boundary control, 153, 208
   fractional PI controller, 47, 51, 52, 55
   internal model control, 31–39, 41, 44
   lag controller, 25
   lead controller, 25
   least fragile controller, 29
   meromorphic controller, 35
   model predictive control, 130
   PD control, 25, 222
   PI control, 26
   rational fractional controller, 47–49, 59
   self-triggered control, 4, 5, 7, 10, 11, 13
   stability regions of PD controllers, 222

stable controller, 28
Convex Embedding, 3, 7, 8, 13
Coprime Factorization, 53, 55, 58, 77

D

Delay
   average delay, 225
   communication channel, 221
   distribution kernel, 224
   gamma distribution with gap, 220, 225, 231
   normal distribution, 220, 227, 231
   processing time, 221
   propagation delay, 141
   transport delay, 19, 179
   uncertain, 224
   uniform distribution, 220, 224, 230
Delay differential algebraic Equation, 95–97
Digital Video Camera, 78
Dissipativity Analysis, 202
Disturbance Rejection, 32, 42–44
Drilling System, 191, 206

E

Environment
   virtual, 220
Exponential stability, 6, 10

F

Feedback Predictor Structure, 65
Flatness
   flatness-based feedback controller, 211
   flatness-based parametrization, 210
Flexible beam, 19

A. Seuret et al. (eds.), Low-Complexity Controllers for Time-Delay Systems, Advances in Delays and Dynamics 2, DOI: 10.1007/978-3-319-05576-3, © Springer International Publishing Switzerland 2014
Formal Polynomial, 49, 50
Forrester Effect, 72, 74

G
Gain margin, 28

I
Integral Inequality, 156, 157, 159, 164, 168
Invariant Set, 127, 128, 130, 132

J
Jensen Inequality, 14, 155–157, 159, 161, 162, 167

L
Line of Sight, 77–79
LMI, 3, 4, 7, 10, 12, 13, 95, 155, 156, 162, 164, 189, 190, 197, 199
Lyapunov, 112, 190
Lyapunov Function, 3, 4, 6, 12, 13, 128, 156, 163, 168
Lyapunov-Krasovskii Functional, 97, 111–113, 118–120, 155, 156, 164, 197

M
Meromorphic Controller, 44
Methods of Lines, 147, 153
Model Reduction, 62, 65
Multi-Model Approximation, 202

N
Numerical methods, 95, 99

P
Partial Differential Equations, 144, 147, 149, 174, 179, 191, 209
Prediction of Boundary Values, 213

R
Reset loops, 111–123

Robotics
position tracking error, 221
transparency, 221
Robust stability margin optimization, 97

S
Sampling, 3–7, 9–13, 15
Saturation, 31, 32, 37, 39–44
Small gain, 28
Smith predictor, 219, 228
Stick-Slip, 190
Supply Chain, 61, 63–65, 67, 70–73
Systems
distributed parameter systems, 191
fractional delay systems, 47, 59
fractional order system, 20
haptics, 219, 222, 233
hybrid time-delay systems, 116, 118
infinite dimensional, 28
infinite dimensional systems, 177, 186
input time-delay systems, 72, 73, 173, 175, 179, 182, 186
interconnected systems, 20
linear time-invariant systems, 4, 5, 7, 13, 96, 97, 127
networked control systems, 4, 155
neutral delay systems, 47, 141, 153, 190
sampled-data systems, 4
teleoperation, 220
unstable, 28

T
Tracking Problems, 88
Two-Degree-of-Freedom Parametrization, 59

W
Wave Equation, 202, 206, 207
Windup observer, 40–42, 44
Work in Progress, 63, 67, 72, 73

Y
Youla-Kučera Parametrization, 55, 59, 86–88