Course on Model Predictive Control
Part V – An Overview to Research Problems

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Outline

1. MPC research: who does what?

2. A research problem: offset-free MPC performance monitoring

MPC research areas and researchers (1/2)

Topic	Linear MPC	Nonlinear MPC
MPC formulations	Mayne, Rawlings, Limon, Lazar, Morari, Pannocchia	Magni, Scattolini, De Nicolao, Grüne, Allgöwer, Findeisen, Guay, Kouvaritakis, Henson
MPC stability and robustness	Lazar, Limon, Rossiter, Chisci, Kouvaritakis, Bemporad, Kerrigan, Mayne, Rawlings, Pannocchia	Teel, Scattolini, Rawlings, Magni, De Nicolao, Lazar, Pannocchia
Fast MPC (online)	Kerrigan, Boyd, Diehl, Bemporad, Zavala, Biegler, Morari, Jones, Jorgensen, Wright, Rawlings, Pannocchia	Diehl, Biegler, Wright, Rawlings, Bock, Findeisen
Fast MPC (explicit control laws)	Bemporad, Morari, Goodwin, Borrelli, Pistikopoulos, Moennigmann, Johansen, Rossiter	Pistikopoulos, Morari, Jones, Raimondo

MPC research areas and researchers (2/2)

Topic	Linear MPC	Nonlinear MPC
Distributed (hierarchical, decentralized) MPC	Rawlings, Wright, Scattolini, Bemporad, Limon, Johansen, Casavola, Christofides, Camponogara, De Schutter, Ferrari-Trecate, Pannocchia	Rawlings, Wright, Allgöwer, Raimondo, Magni, Scattolini
Performance Monitoring	Qin, Rawlings, Patwardhan, Shah, Huang, Seborg, Lee, Pannocchia	?
Constrained state estimation	Rawlings, Mayne, Lee, Diehl, Bitmead, Goodwin	
Identification and input design	Qin, Huang, Zhu, Ljung, Chiuso, Pannocchia	?
Applications	Process industries, Automotive, Aerospace, Finance, Robotics	Chemical processes, Biomedical, Robotics

Performance degradation diagnosis and remedies in offset-free MPC

Go to the ACC 2012 presentation!