

**Preliminary Program**  
 17th Nordic Process Control Workshop (NPCW)  
 26-27 January 2012, DTU Lyngby Campus, Lyngby, Denmark  
**Thursday, January 26, 2012**

08:30	09:00	Registration / coffee & refreshments
<b>Session 1: Award Session</b>		
09:00	09:10	Welcome and opening address
09:10	09:20	Award ceremony
09:20	10:20	Award lecture: A Nonlinear Programming Path to NMPC and Real-Time Optimization <b>Lorenz T. Biegler. Carnegie Mellon University</b>
break 10 min		Coffee & refreshments
<b>Session 2: Identification and Monitoring</b>		
10:30	10:50	Fuel Moisture Soft-sensor and its Validation for the Industrial BioGrate Boiler <b>Jukka Kortela &amp; Sirkka-Liisa Jämsä-Jounela. Aalto University</b>
10:50	11:10	Soft Sensor Modelling for the Severity of Biomass Pretreatment <b>Remus M. Prunescu, Mogens Blanke, Jakob M. Jensen &amp; Gürkan Sin. DONG Energy &amp; DTU</b>
11:10	11:30	Identification of Switching System <b>Amir H Shirdel &amp; Hannu Toivonen. Åbo Akademi University.</b>
11:30	11:50	ModelID, an Interactive Program for Identification of MPC Relevant State-Space Models <b>Jørgen K.H. Knudsen. 2-control</b>
11:50	12:10	Data Mining for Process Identification <b>D. Peretzki, A. Isaksson, A.C. Bittencourt &amp; K. Forsman. Linköping University, ABB &amp; Perstorp</b>
Lunch break at restaurant 101		
<b>Session 3: Control Applications in Industry – Invited Session</b>		
13:10	13:35	Intelligent Control in the Future Energy System. Challenges, Solutions, and Business Potential <b>Tommy Mølbak. DONG Energy</b>
13:35	14:00	MPC at Statoil's Kalundborg Refinery <b>Anne-Katrine Ipsen. Statoil Refinery, Kalundborg</b>
14:00	14:25	Industrial challenges from the Cement and Mining Industry <b>Bodil Recke &amp; Hasan Yazdi. FLSmidth</b>
14:25	14:50	Application and Development of APC Schemes in Novozymes Fermentation Pilot Plant <b>Jonas Andersson &amp; Stuart M. Stocks. Novozymes</b>
14:50	15:15	Early Warning Model for Tunnel Pasteurizer Energy Consumption <b>Falko Jens Wagner. Sander Hansen Competence Center, Krones Nordic</b>
break 15 min		Coffee & refreshments
<b>Session 4: Optimization</b>		
15:30	15:50	Optimal Controlled Variables for Parallel Process Units <b>Johannes Jäschke &amp; Sigurd Skogestad. NTNU</b>
15:50	16:10	Performance for Tracking MPC with Unreachable Set-points <b>J.P. Maree, J. B. Rawlings &amp; L. S. Imsland. NTNU &amp; University of Wisconsin-Madison</b>
16:10	16:30	Oil Reservoir Production Optimization using Single Shooting and ESDIRK Methods <b>Andrea Capolei, Carsten Völcker, Jan Frydendall &amp; John Bagterp Jørgensen. DTU</b>
16:30	16:50	Optimization of lift gas allocation in a gas lifted oil field as non-linear optimization problem <b>Roshan Sharma, Kjetil Fjalestad &amp; Bjørn Glemmestad. Telemark University College &amp; Statoil</b>
16:50	17:10	Model-Based Optimization of Economical Grade Changes for Borstar Polyethylene Plant. <b>Per-Ola Larsson, Johan Åkesson, Niclas Carlsson, Niklas Andersson. Lund University &amp; Borealis</b>
End of the scientific program, day #1		

17:10	18:10	NPCW Steering Group Meeting
19:30	22:30	Dinner at restaurant Odd Fellow Palæet in downtown Copenhagen

### Friday, January 27, 2012

08:30	09:00	Coffee & refreshments
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#### Session 5: Perspectives of Control in Industry

09:00	09:20	Modeling Operating Modes during Plant Life Cycle <b>Sten Bay Jørgensen &amp; Morten Lind. DTU</b>
09:20	09:40	Teaching Control Principles to Industrial Practitioners <b>Kristian Soltesz , Charlotta Johnsson &amp; Tore Hägglund. Lund University</b>
09:40	10:00	Industrial Application of Predictive Functional Control <b>Jacques Richalet</b>

#### Session 6: Poster session with coffee & refreshments

10:00	11:00	Poster session / see the poster program below
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#### Session 7: Control Theory

11:00	11:20	The Improved SIMC Method for PID Controller Tuning <b>Sigurd Skogestad &amp; Chriss Grimholt. NTNU.</b>
11:20	11:40	Wannabe-MPC for Large Systems based on Multiple Iterative PI Controllers <b>Pasi Airikka &amp; Mats Friman. Metso Corporation</b>
11:40	12:00	Regulatory Layer Selection through Partial Control <b>Ramprasad Yelchuru &amp; Sigurd Skogestad. NTNU</b>

Lunch break at restaurant 101

#### Session 8: Monitoring and Fault Diagnosis

13:00	13:20	Application of Shape-based Stiction Detection Methods for the Critical Valves of a Board Machine. <b>Octavio Pozo Garcia &amp; Sirkka-Liisa Jämsä-Jounela. Alto University</b>
13:20	13:40	MPC Techniques in Fault Tolerant Control Design <b>Florin Stoican, Sorin Olaru &amp; Morten Hovd. NTNU</b>
13:40	14:00	Event-driven Flow Control of Incompressible Fluid <b>Sebastian Roll &amp; Heinz A. Preisig. NTNU</b>
14:00	14:20	Process Monitoring of Three Tank System <b>Harri Aaltonen. University of Oulu</b>

break 10 min		Coffee & refreshments
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#### Session 9: Control Applications

14:30	14:50	Model-based analysis of control performance in sewer systems. <b>A. H. Mollerup, M. Mauricio-Iglesias, NB. Johansen, D. Thornberg, PS. Mikkelsen, G. Sin. Copenhagen Wastewater Innovation &amp; DTU</b>
14:50	15:20	Dynamic Simulation of Oxy Combustion in a Pilot Scale CFB Boiler. <b>M. Hultgren, L. Lohiniva, J. Kovacs, J. Ritvanen &amp; A. Tourunen. Univ of Oulu, Foster Wheeler, LUT &amp; VTT</b>
		Experimental Testing of Oxy Combustion in a Pilot Scale CFB boiler. <b>H. Mikkonen, L. Lohiniva, A. Tourunen, M. Jegoroff, M. Hultgren, J. Kovács. VTT, University of Oulu &amp; Foster Wheeler Energia</b>
15:20	15:40	Greenhouse Artificial Lighting Control <b>Torsten Wik, Anna-Maria Carstensen, Tessa Pocock. Chalmers University of Technology &amp; Heliospectra</b>
15:20	16:00	Control of Blood Glucose for People with Type 1 Diabetes: an Overnight in-vivo Study <b>D. Boiroux, S. Schmidt, L. Frøssing, K. Nørgaard, S. Madsbad, O. Skyggebjerg, A-K. Duun-Henriksen, NK. Poulsen, H. Madsen, JB. Jørgensen. Hvidovre Hospital and DTU.</b>

#### Closing Remarks

16:00	16:05	Thank you all folks & bon voyage home!
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## List of Poster Presentations – NPCW17

1. A Dantzig-Wolfe Decomposition Algorithm for Linear Economic MPC of a Power Plant Portfolio. *Laura Standardi, Niels Kjølstad Poulsen & John Bagterp Jørgensen. DTU Informatics. Kristian Edlund DONG Energy*
2. A model-based FDD method of interacting control loops and its application to a mixing tank process. *Karhan Özdenkçi, Alexey Zakharov & Sirkka-Liisa Jämsä-Jounela. Aalto University*
3. A New Static Estimator for Estimation of Primary Variables from Combination of Secondary Measurements. *Maryam Ghadrhan & Sigurd Skogestad. NTNU. Ivar J. Halvorsen. SINTEF ICT*
4. Design of Optimal Low-Order Feedforward Controllers for Disturbance Rejection. *Martin Hast & Tore Hägglund. Lund University*
5. Educational toolkit for teaching FDD methods. *Venla Kuuluvainen, Vesa-Matti Tikkala, Esa Kiiski, Sirkka-Liisa Jämsä-Jounela. Aalto University*
6. Experimental study of anti-slug control on small-scale test rig. *Esmaeil Jahanshahi & Sigurd Skogestad. NTNU*
7. Fault Analysis as a Tool for Fault Detection and Diagnosis System Development in Large Scale Systems. *Vesa-Matti Tikkala, Helena Laavi & Sirkka-Liisa Jämsä-Jounela. Aalto University*
8. Fault detection and diagnosis system for the drying section of a board machine. *A. Zakharov & Sirkka-Liisa Jämsä-Jounela. Aalto University*
9. Heuristic Evolutionary Random Optimizer for Non-linear Optimization Including Control and Identification Problems. *Pasi Airikka. Metso Corporation*
10. Industrial validation of the dynamic BioGrate boiler model. *Alexandre Boriouchkine & Sirkka-Liisa Jämsä-Jounela. Aalto University.*
11. Iterative Methods for MPC for Smart Grids on Graphical Processing Units. *Nicolai Fog Gade-Nielsen, John Bagterp Jørgensen & Bernd Damman. DTU Informatics*
12. Minimum Backed-off Operating Point Selection. *M. Nabil & Sridharakumar Narasimhan. IIT Madras. Sigurd Skogestad, NTNU.*
13. Model Predictive Control for an Industrial SAG Mill. *Valeriu Ohan & John Bagterp Jørgensen. DTU Informatics, Florian Steinke, Michael Metzger, Thomas Runkler, Siemens AG*
14. Model Predictive Control of a Nonlinear Systems with Known Scheduling Variable. *Mahmood Mirzaei & Niels Kjølstad Poulsen. DTU Informatics. Hans Henrik Niemann. DTU Electrical Engineering*
15. Modelica library for simulation of bioprocesses. *Jan Peter Axelsson. Vascaia AB*
16. Modeling and simulation of an electrical grid subsystem for power balance analysis. *Luminița C. Totu, John J. Leth & Rafael Wisniewski. Aalborg University*
17. Modeling of the freezing process for fish in vertical plate freezers. *Christoph Backi & Jan Tommy Gravdahl. NTNU*
18. Modeling Smart Energy Systems for Model Predictive Control. *Rasmus Halvgaard, Niels Kjølstad Poulsen, Henrik Madsen & John Bagterp Jørgensen. DTU Informatics*
19. Modelling and control design for SHARON/Anammox reactor sequence. *B. Valverde-Pérez, Miguel Mauricio-Iglesias & Gürkan Sin. DTU Chemical Engineering*
20. Modelling Fungal Fermentations For Enzyme Production. *Mads O. Albaek & Krist V. Gernaey. DTU Chemical Engineering. Morten S. Hansen & Stuart M. Stocks. Novozymes A/S*

21. Operation and Control of Enzymatic Biodiesel Production. *Jason A. Price, Jakob Kjøbsted Huusom, Mathias Nordblad & John Woodley.* **DTU Chemical Engineering**
22. Optimal Control of a Batch Reactor Using the Linearized Hamilton-Jacobi-Bellman Equation. *Per Rutquist.* **Tomlab Optimization AB.** *Torsten Wik & Claes Breitholtz.* **Chalmers University of Technology**
23. Optimal Input Design for Parameter Identification i Dynamic Systems Using Nonlinear Programming. *Tor Aksel N. Heirung & Bjarne Foss.* **NTNU.** *B. Erik Ydstie.* **Carnegie Mellon University**
24. Optimisation of Oil Production in Two – Phase Flow Reservoir Using Simultaneous Method and Interior Point Optimiser. *Dariusz Lechr, Andrea Capolei, Carsten Völcker & John Bagterp Jørgensen.* **DTU Informatics Erling Halfdan Stenby.** **DTU Chemistry**
25. Process Monitoring Scheme for Thickness Sensor Fouling Based on Adaptive Self-Organized Maps. *Vesa-Matti Tikkala & Sirkka-Liisa Jämsä-Jounela.* **Aalto University**
26. Production Optimization for Two-Phase Flow in an Oil Reservoir. *Carsten Völcker, John Bagterp Jørgensen & Per Grove Thomsen.* **DTU Informatics**
27. Reducing Revenue Loss due to Utility Disturbances using Buffer Tanks - A Case Study at Perstorp. *Anna Lindholm, Charlotta Johnsson & Tore Hägglund.* **Lund University.** *Hampus Carlsson.* **Perstorp AB**
28. Regulatory Control of 4-product Kaibel column. *Deeptanshu Dwivedi.* **Applied Cypernetics.** *Ivar J. Halvorsen & Sigurd Skogestad.* **NTNU**
29. Robust implementation of optimal control policies for transient processes. *Vinicius de Oliveira, Johannes Jäschke & Sigurd Skogestad.* **NTNU**
30. Simulation, Control and Optimization of Single Cell Protein Production in a U-Loop Reactor. *Franck Guillaume Engoulevant & John Bagterp Jørgensen.* **DTU Informatics**
31. State Estimation for the Automotive SCR Process. *Guofeng Zhou & Jakob Kjøbsted Huusom.* **DTU Chemical Engineering.** *John Bagterp Jørgensen.* **DTU Informatics.** *Christophe Duwig,* **Haldor Topsøe A/S**
32. State Estimators for a Pilot Anaerobic Digestion Reactor. *Finn Haugen, Rune Bakke & Bernt Lie.* **Telemark University College**
33. Stochastic Model Predictive Control with Applications in Smart Energy Systems. *Leo Emil Sokoler, Niels Kjølstad Poulsen, Henrik Madsen & John Bagterp Jørgensen.* **DTU Informatics** *Kristian Edlund, Tommy Mølbak,* **DONG Energy**