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29 April 2009

The Final Programme of IFAC CAO'09 Workshop

Wednesday 6 May 2009	Thursday 7 May 2009	Friday 8 May 2009
9:00 Registration	09:00 - 10:00 Plenary II, Aud 2	09:00 - 10:00 Plenary III, Aud 2
Coffee	Coffee	Coffee
11:00 – 11:30 Opening 11:30 - 12:30 Plenary I, Aud 2	10:30-12:30 TAI, Aud 2 Optimal PDE control 2 10:30-12:30 TBI, Gamma Differential games I 10:30-12:30 TCI , C231.1 Applications in environmental sciences, economics and management 2	10:30-12:30 FAI, Aud 2 Optimal control 2 10:30-12:30 FBI, Gamma Multiobjective optimization I 10:30-12:00 FCI, C231.1 Optimization with uncertainties
Lunch	Lunch	Lunch
13:45 -16:15 WAI, Aud 2 Robust control and stabilisation I 13:45-16:15 WBI, Gamma Numerical methods in optimization, 13:45-16:15 WCI, C231.1 Applications in environmental sciences, economics and management I	13:45-15:45 TA2, Aud 2 Robust control and stabilisation 2 13:45-15:45 TB2, Gamma Differential games 2 13:45-15:45 TC2 , C231.1 Adaptive control	13:45-14:45 FA2, Aud 2 Optimal control 3 13:45-15:15 FB2, Gamma Multiobjective optimization 2
Coffee	Coffee	Coffee
16:45-17:45 WA2, Aud 2 Optimal PDE control I 16:45-17:45 WB2, Gamma Model-predictive control 16:45-17:45 WC2 , C231.1 Stochastic optimization	16:15-17:15 TA3, Aud 2 Optimal control I 16:15-17:45 TB3, Gamma Optimization methods 16:15-17:45 TC3, C231.1 Applications in environmental sciences, economics and management 3	
18.00 Get Together Party at the lobby of Agora campus	18:15 Walking tour 19:00 Workshop Dinner in the Survo Manor House	

Wednesday 6 May 2009

9:00 Registration

10:30 – 11:00 Coffee

Opening, Auditorium 2

11:00 – 11:30 Welcome addresses

Timo Tiihonen, Vice Rector, University of Jyväskylä

Alexander Tarasyev, IPC Chair,
Institute of Mathematics and Mechanics (IMM) of Ural Branch of the Russian Academy of Sciences

Kaisa Miettinen, NOC Chair, University of Jyväskylä



WPI Plenary I

Auditorium 2, Chair Alexander Tarasyev

11:30 - 12:30 A least-squares/fictitious domain method for linear elliptic boundary value problems with Neumann or Robin boundary conditions: A virtual control approach
Roland Glowinski, University of Houston

12:30 Lunch

WAI Robust control and stabilisation I

Auditorium 2, Chair Felix Chernousko

13:45 - 14:15 Robust approximate tracking of matched disturbance non - control affine systems
 P. Ortner, E. Gruenbacher, L. del Re, Institute for Design and Control of Mechatronical Systems

14:15 - 14:45 Smooth stabilization and optimal H₂ design
 Joris Vanbiervliet, Wim Michiels, Stefan Vandewalle, K.U. Leuven

14:45 - 15:15 PSO based nonlinear predictive control of single area load frequency control
 M. S. Yousuf, H. N. Al-Duwaish, Z. M. Al-Hamouz, King Fahd University of Petroleum & Minerals

15:15 - 15:45 Robust control optimization for thermo-energetic installations
 Tudor-Bogdan Airimitoiaie, Dumitru Popescu, Catalin Dimon, Grigore Stamatescu, University "Politehnica" of Bucharest

15:45 - 16:15 Constrained optimal control strategy for multimodal urban traffic network
 Neila Bhourri, INRETS / GRETIA

WBI Numerical methods in optimization

Gamma, Chair Hannu Toivonen

13:45 - 14:15 Novel method to control linear systems of acceleration constrained dynamics
 Josef Shinar, Technion - Israel Institute of Technology, Valery Y. Glizer, Ort Braude College, Vladimir Turetsky, Technion - Israel Institute of Technology

14:15 - 14:45 Quasi-finite-rank approximation of compression operators in sampled-data systems and time-delay systems
 Tomomichi Hagiwara, Koichiro Okada, Kyoto University

14:45 - 15:15 A reduction type penalty algorithm for nonlinear semi-infinite programming
 Alzira Mota, Institute Polytechnic of Porto, A. Ismael F. Vaz, University of Minho

15:15 - 15:45 Using particle swarm optimization for reduced order H₈ synthesis
 G. Sandou, G. Duc, SUPELEC

15:45 - 16:15 A multi-quantile approach for open-loop stochastic dynamic programming problems
 Rodrigo T. N. Cardoso, Centro Federal de Educação Tecnológica de Minas Gerais, Universidade do Algarve, Ricardo H. C. Takahashi, Frederico R. B. Cruz, Universidade Federal de Minas Gerais, Carlos M. Fonseca, Universidade do Algarve, Universidade Técnica de Lisboa



WC1 Applications in environmental sciences, economics and management I
Room Ag C 23 I.1, Chair Nikolay Lukoyanov

13:45 - 14:15 Economic growth with political lobbying and wage bargaining
Tapio Palokangas, University of Helsinki

14:15 - 14:45 Model of quality competition with a non-uniform consumer distribution
Margarita A. Gladkova, Nikolay A. Zenkevich, Graduate School of Management
St. Petersburg State University

14:45 - 15:15 High-precision algorithms for constructing optimal trajectories via solving
Hamiltonian systems
Andrey A. Krasovskii, Institute of Mathematics and Mechanics UrB RAS, Vienna
Institute of Demography, Alexander M. Tarasyev, Institute of Mathematics and
Mechanics UrB RAS

15:15 - 15:45 Regulating environmental externalities through public firms: A differential game
Davide Dragone, Luca Lambertini, Arsen Palestini, University of Bologna

15:45 - 16:15 On turnpike solutions of some optimal growth problems
Amos Zemel, Ben Gurion University of the Negev

16:15 – 16:45 Coffee

WA2 Optimal PDE control I
Auditorium 2, Chair Alexander Tarasyev

16:45 - 17:15 Semi-decentralized approximation of an optimal control applied to a cantilever array?
M. Lenczner, Université de Franche-Comté, Y. Yakoubi, Université Pierre et Marie Curie

17:15 - 17:45 A posteriori error estimates for optimal control problems
Sergey I. Repin, Steklov Institute of Mathematics in St. Petersburg, University of Jyväskylä

WB2 Model-predictive control
Gamma, Chair Kai Zenger

16:45 - 17:15 Nonlinear model predictive control of a diesel engine airpath
P. Ortner, R. Bergmann, Johannes Kepler University, H. J. Ferreau, K.U. Leuven,
L. del Re, Johannes Kepler University

17:15 - 17:45 Model predictive control for linear parameter varying systems using
path-dependent Lyapunov functions
Marc Jungers, Nancy-Université, Rodrigo P. Caun, Ricardo C. L. F. Oliveira,
Pedro L. D. Peres, University of Campinas



WC2 Stochastic optimization
Room Ag C 23 I.1, Chair Vladimir Turetsky

16:45 - 17:15 A moving horizon approach to a chance constrained nonlinear dynamic optimization problem
 Abebe Geletu, Michael Klöppel, Pu Li, Armin Hoffmann, Ilmenau University of Technology

17:15 - 17:45 Regulator design using a multiobjective genetic algorithm
 Fredrik Östman, Frank Pettersson, Hannu T. Toivonen, Åbo Akademi University

18:00-19:00 Get-together hosted by the City of Jyväskylä at the lobby of Agora campus.

Thursday 7 May 2009

TPI Plenary II
Auditorium 2, Chair Felix Chernousko

09:00 - 10:00 Hamiltonian potential functions for differential games
Luca Lambertini, University of Bologna

10:00 – 10:30 Coffee

TAI Optimal PDE control 2
Auditorium 2, Chair Christian Westermayer

10:30 - 11:00 An advanced criterion for optimal actuator and sensor placement on complex flexible structures
 Christian Westermayer, Alexander Schirrer, Mark Hemedi, Martin Kozek, Vienna University of Technology

11:00 - 11:30 Error estimates for the solution of a control constrained optimal control problem with interior penalties
 Felipe Álvarez, Universidad de Chile-CNRS, Jérôme Bolte, Université Paris, J. Frédéric Bonnans, Francisco J. Silva, École Polytechnique

11:30 - 12:00 Finite and infinite transmission zeros for infinite-dimensional systems
 Petteri Laakkonen, Seppo Pohjolainen, Tampere University of Technology

12:00 - 12:30 A less problem dependent approach for optimal trajectories with singular arcs: Application to space launchers
 P. Martinon, F. Bonnans, INRIA Saclay and CMAP, Ecole Polytechnique, E. Trélat, Université d'Orléans

TBI Differential games I
Gamma, Chair Anatolii Kleimenov

10:30 - 11:00 On the notion of stability defect in game control problems
 Vladimir N. Ushakov, Yaroslav A. Latushkin, Institute of Mathematics and Mechanics

11:00 - 11:30 On the value function of a differential game with simple dynamics and piecewise linear data
 Lyubov G. Shagalova, Ural Branch of the Russian Academy of Sciences



11:30 - 12:00 Matrix block formulation for closed-loop memoryless discrete-time Nash solution
 Marc Jungers, Nancy-Université, Hisham Abou-Kandil, CNRS

12:00 - 12:30 Open-loop Stackelberg strategy for linear quadratic games via matrix pencil approach
 Marc Jungers, Nancy-Université, Hisham Abou-Kandil, CNRS, Cristian Oara, Radu Stefan, University Politehnica Bucharest

TC1 Applications in environmental sciences, economics and management 2
Room Ag C 231.1, Chair Tapio Palokangas

10:30 - 11:00 Non-renewable resources and the sustainability of the economic growth under bilateral trade
 Francisco Cabo, Guiomar Martín-Herrán, Universidad de Valladolid, María Pilar Martínez-García, Universidad de Murcia

11:00 - 11:30 Multistage dynamics of international environmental agreements: free-riding from membership and compliance
 Yulia Pavlova, University of Jyväskylä

11:30 - 12:00 The complete fish wars with changing area for fishery
 Vladimir V. Mazalov, Anna N. Rettieva, Karelian Research Center of RAS

12:00 - 12:30 Optimal dynamics of functionality development in open innovation
 C. Watanabe, J. Shin, Tokyo Institute of Technology, J. Heikkinen, University of Jyväskylä, A. Tarasyev, IIASA

12:30 Lunch

TA2 Robust control and stabilisation 2
Auditorium 2, Chair Stefan Pickl

13:45 - 14:15 Power generation/distribution control systems topology selection based on robustness evaluation
 Jozef B. Lewoc, BPBiT Leader, Antoni Izworski, Slawomir Skowronski, Wroclaw University of Technology, Antonina Kieleczawa, Institute of Power System Automation, Georgi Dimirovski, Dogus University

14:15 - 14:45 Statistical characteristics of attainable set of controllable system
 L. I. Rodina, E. L. Tonkov, Udmurtia State University

14:45 - 15:15 Consistency and pole assignment in linear systems with incomplete feedback
 Vasili A. Zaitsev, Udmurtia State University

15:15 - 15:45 Delay-dependent stability analysis of neutral systems using positive polynomials optimization
 Bogdan Dumitrescu, Politehnica University Bucharest, Tampere University of Technology, Bogdan C. Sicleru, Radu Stefan, Politehnica University Bucharest



TB2 Differential games 2

Gamma, Chair Marc Jungers

13:45 - 14:15 Extension of a problem of the game control

A.G. Chentsov, Ju.V. Shapar, Institute of Mathematics and Mechanics, Ural Branch of Russian Academy of Sci.

14:15 - 14:45 A numerical construction algorithm of Nash and Stackelberg solutions for two-person non-zero sum linear positional differential games

Anatolii F. Kleimenov, Ural Branch of RAS, Sergei I. Osipov, Dmitry R. Kuvshinov, Ural State University

14:45 - 15:15 Reconstruction of differential games with Bolza payoff

Yurii Averboukh, Institute of mathematics and mechanics UrB RAS

15:15 - 15:45 A necessary and sufficient condition for the existence of value for positional differential game

Sergei Chistyakov, Fedor Nikitin, Saint-Petersburg State University

TC2 Adaptive control

Room Ag C 231.1, Chair Dmitrii Serkov

13:45 - 14:15 A new exterior-point approach to a fixed-order output feedback controller design

Yasushi Kami, Akashi National Collage of Technolgy, Eitaku Nobuyama, Kyushu Institute of Technology

14:15 - 14:45 A simulator for infinite-dimensional systems with a self-tuning controller

Markku Åkerblom, Timo Hämäläinen, Seppo Pohjolainen, Tampere University of Technology

14:45 - 15:15 Performance comparison between PI(D) and fractional PI controllers

Juan J. Gude, Evaristo Kahoraho, University of Deusto

15:15 - 15:45 NPP APCS diagnostics implementation as a routine task of APCS

V.G. Promyslov, S.I. Masolkin, V.A. Trapeznikov Institute of Control Sciences

15:45 – 16:15 Coffee

TA3 Optimal control I

Auditorium 2, Chair Carlos Fonseca

16:15 - 16:45 Optimization of certain mobile robotic systems

Felix L. Chernousko, Institute for Problems in Mechanics of the Russian Academy of Sciences

16:45 - 17:15 The synthesis of optimal control system by the network operator method

Askhat I. Diveev, Institution of Russian Academy of Sciences Dorodnicyn Computing Centre of RAS, Elena A. Sofronova, Peoples' Friendship University of Russia

TB3 Optimization methods

Gamma, Chair Maria Pilar Martinez-Garcia

16:15 - 16:45 Dynamic equilibrium model for spatial auction markets

Elisabetta Allevi, Brescia University, Adriana Gnudi, Bergamo University, Igor V. Konnov, Kazan University

16:45 - 17:15 Direct fire target selection in Sandis combat simulation

Esa Lappi, Risto Bruun, Kosti Jokinen, Defence Forces Technical Research Center

17:15 - 17:45 Optimization problems for distribution of resources in spatial systems

Igor V. Konnov, Olga A. Kashina, Kazan University, Erkki Laitinen, University of Oulu



TC3 Applications in environmental sciences, economics and management 3 **Room Ag C 231.1, Chair Nina N. Subbotina**

16:15 - 16:45 Nonlinear stabilizers of economic growth under exhausting energy resources
 Robert U. Ayres, European School of Business Administration INSEAD, Andrey A. Krasovskii, Vienna Institute of Demography, Institute of Mathematics and Mechanics UrB RAS, Alexander M. Tarasyev, Institute of Mathematics and Mechanics UrB RAS

16:45 - 17:15 Closed loop dynamic optimization of a petroleum refinery process
 M. Aho, Neste Oil Oyj, S. Bergman, L. Hammarström, K. Yli-Opas, A. Pelkola, M. Sourander, Neste Jacobs Oy

17:15 - 17:45 Optimization of the pulp mill economical efficiency; Study on the behavior effect of the economically significant variables
 A. Zakharov, S.-L. Jämsä-Jounela, Helsinki University of Technology

18:15 Guided walking tour to the dinner, departs from the Secretariat desk

19:00 Dinner in the Survo Manor House
 Welcome address, Pekka Neittaanmäki, IPC Co-Chair

Friday 8 May 2009

FPI Plenary III
Auditorium 2, Chair Kaisa Miettinen

09:00 - 10:00
Algorithms for solving stochastic discrete control problems with finite time horizon - The challenging role of discrete optimal control within climate protection activities and the Kyoto protocol, Stefan Pickl, Universität der Bundeswehr

10:00 – 10:30 Coffee

FAI Optimal control 2
Auditorium 2, Chair Luca Lambertini

10:30 - 11:00 Receding horizon optimal control of Wiener systems by application of an asymmetric cost function
 Daniel Alberer, Harald Kirchsteiger, Luigi del Re, Johannes Kepler University Linz, Hans Joachim Ferreau, Moritz Diehl, K.U. Leuven

11:00 - 11:30 Optimal design of a sliding mode AGC controller: Application to nonlinear interconnected models
 Z. Al-Hamouz, H. Al-Duwaish, KFUPM, N. Al-Musabi, Petroleum Institute

11:30 - 12:00 A PSO-Subspace algorithm for identification of Hammerstein models
 S. Z. Rizvi, H. N. Al-Duwaish, King Fahd University of Petroleum & Minerals



12:00 - 12:30 An algorithm for solving discrete optimal control problems with Infinite time horizon - Determining the minimal mean cost cycles in a directed graph
 Dmitrii Lozovanu, Academy of Sciences, Stefan Pickl, Universität der Bundeswehr

FBI Multiobjective optimization I
Gamma, Chair Kaisa Miettinen

10:30 - 11:00 Generalized efficient solutions to multiobjective optimization in Banach spaces
 P.I. Kogut, Dnipropetrovsk National University, R. Manzo, Università di Salerno

11:00 - 11:30 An open-loop invariant-set approach for multiobjective dynamic programming problems
 Rodrigo T. N. Cardoso, Centro Federal de Educação Tecnológica de Minas Gerais, Universidade do Algarve, Ricardo H. C. Takahashi, Universidade Federal de Minas Gerais, Carlos M. Fonseca, Universidade do Algarve, Universidade Técnica de Lisboa

11:30 - 12:00 Multi-objective design with a stochastic validation of vaccination campaigns
 André R. da Cruz, Universidade Federal de Minas Gerais, Rodrigo T. N. Cardoso, Centro Federal de Educação Tecnológica de Minas, Ricardo H. C. Takahashi, Universidade Federal de Minas Gerais

12:00 - 12:30 Multiple objective optimisation of cyclic chemical systems with distributed parameters
 Filip Logist, Jan F. Van Impe, Katholieke Universiteit Leuven

FCI Optimization with uncertainties
Room Ag C 231.1, Chair Andrey Krasovskiy

10:30 - 11:00 Viscosity solutions to hereditary dynamical optimization
 Nikolay Yu. Lukoyanov, Institute of Mathematics and Mechanics of the Ural Branch of the Russian Academy of Sciences

11:00 - 11:30 On the optimal risk function for the system under dynamic disturbances
 Dmitry A. Serkov, IMM UB RAS

11:30 - 12:00 Recursive state estimation for linear non-causal descriptor systems with uncertain parameters
 Sergiy M. Zhuk, Taras Shevchenko Kyiv National University

12:30 Lunch

FA2 Optimal control 3
Auditorium 2, Chair Yaroslav Latushkin

13:45 - 14:15 The method of characteristics in solving of optimal control problems with terminal cost
 N. Subbotina, E. Kolpakova, Institute of Mathematics and Mechanics Ural Branch of RAS

14:15 - 14:45 Optimal guidance law: impact angle & terminal lateral acceleration control
 Chang-Kyung Ryoo, Inha University, H. Jin Kim, Seoul National University, Min-Jea Tahk, KAIST, Jin-Ik Lee, Agency for Defence Development



FB2 Multiobjective optimization 2

Gamma, Chair Pekka Neittaanmäki

13:45 - 14:15 Stability analysis for a parameterized multicriteria Boolean linear programming problem
Yury Nikulin, Marko M. Mäkelä, University of Turku

14:15 - 14:45 Multistage optimisation strategy for solving production planning problems
R. Küttner, J. Majak, Tallinn University of Technology

14:45 - 15:15 Towards understanding evolutionary bilevel multi-objective optimization algorithm
Ankur Sinha, Kalyanmoy Deb, Helsinki School of Economics

15:00 – 15:45 Coffee

General info

Venue

University of Jyväskylä
Mattilanniemi 2, Agora Building
40014 University of Jyväskylä

Secretariat

At the entrance lobby of Agora campus on the 1.st floor.
Open daily during the programme.
Tel. +358 40 542 9300 during the workshop.

Transportation

Taxi +3581006900
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City center - University: Bus number 5
Laajavuori - University: Bus numbers 25K and 5

Organized by IFAC NMO

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