



T T O K

**IFAC WORKSHOP
TECHNOLOGY TRANSFER IN DEVELOPING
COUNTRIES:
AUTOMATION IN INFRASTRUCTURE
CREATION - TT**

May 17-20, 2007,

Golden Dolphin Hotel, Çeşme / TÜRKİYE.



www.deu.edu.tr/decom07

Sponsored by

IFAC Technical Committee on Developing Countries (TC-9.3)
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Mechatronic Systems (TC-4.2)
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Power Plants and Power Systems (TC-6.3)
Robust Control (TC-2.5)
Social Impact of Automation (TC-9.2)
Supplemental Ways for Improving Internal Stability (TC-9.5)
Robotics (TC-4.3)
Transportation Systems (TC-7.4)



**DECOM-TT 2007
Local Organizing Committee**

Chairs

Erol UYAR & Georgi Dimirovski

Members

Zeki Kiral, Aytaç Gören, Levent Çetin, Özgün Başer
(Dokuz Eylül University)

| May 17,2007 Morning | | |
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| <u>Social Program of the Workshop*</u> | | |
| <i>17.05.2007: Turkish Night with folklore and music in Hotel.</i> | | |
| <i>18.05.2007: After dinner, trip to town Cesme and Alacati (ice and coffee near the sea).</i> | | |
| <i>19.05.2007: Trip to Ephesus, Virgin Mary House and Selçuk</i> | | |
| * Social Activities Participation is free for the participants who paid his/her registration fee. Please contact with local organizing committee before 17th of May 2007 16.30 hrs for Social Activities Participation. | | |
| 09:00-10:30 | WELCOME CEREMONY | |
| Session 1: | INVITED PLENARY TALKS | |
| Chair: | Tatjana Kolemisevska-Gugulovska, Erol Uyar, Leyla Gören Sümer | |
| Okyanus Hall 11:00-12:30 | <p>"From snakes to humanitarian assistance robots" Dr. Paulo DEBENEST from Tokyo Institute of Technology</p> <p>"Nanorobots for microfactories to operations in the human body and robots propelled by bacteria" by Professeur adjoint B.Ing. (UQTR), M.Ing., Ph.D. (McGill) Sylvain MARTEL from Polytechnique Montréal.</p> | |

| May 17,2007 Afternoon | | |
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| Session 1: | MOTION, LOCATION, SENSING, AND VISION | |
| Chair: | Stevica GRAOVAC , Levent CETİN | |
| Okyanus Hall 14:00-16:00 | | One Approach to Road Curvature Estimation via Digital Image Processing L. SUPIC, S. GRAOVAC Mapping and Outdoor Localization by Using Algorithmic DGPS and Kalman Filtering E. UYAR, B. KARAHODA, O. ORAL Navigation of an Unmanned Vehicle by Using Algorithmic DGPS and Kalman Filter E. UYAR, B. KARAHODA, O. ORAL Vision Based Reference Generator for Mobile Manipulator L. CETİN, E. UYAR, E. AKCAY Application of Dempster-Shafer Evidence Theory to Sensors of an Autonomous Mobile Robot A. GOREN, E. UYAR, Z. DICLE Supervised Organizing Map Application for Image and Sound Recognition and Fusion E. UYAR, B. KARAHODA |
| Okyanus Hall 16:30-18:30 | | AEROSPACE MODELLING AND CONTROL APPLICATIONS Chair: Mile Stankovski, Saso Gelev A Hybrid Approach in foF2 Forecast Mapping Including Disturbed Conditions E. ALTUNTAS, T. YAPICI, Y. TULUNAY, E. TULUNAY, Z. KOCABAS, E.T. SENALP UKF Based Filters in INS/GPS Integrated Navigation Systems: A Theoretical Study J.-H. XU, Y.-W. JING, L.-D. SHI, S. GELEV, G. M. DIMIROVSKI UKF Based Filters in INS/GPS Integrated Navigation Systems: Novel Application Results J.-H. XU, Y.-W. JING, L.-D. SHI, S. GELEV, G. M. DIMIROVSKI Integration of Helicopter Air Data System with Global Positioning System Using Kalman Filter T. MUTLU, C. HADJIEV A Novel Mode of Fire Control in Missile Systems for Air Defence S. GELEV, Z. GACOVSKI, J.-H. XU, Y.-W. JING, S. DESKOVSKI, G. M. DIMIROVSKI Fuzzy Logic in Fire Control Systems for Air Defence S. GELEV, Z. GACOVSKI, J.-H. XU, Y.-W. JING, S. DESKOVSKI |

| May 17, 2007 Afternoon | | | |
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| Session 1: | | NEW RESULT IN CONTROL OF TIME-DELAY SYSTEMS | |
| Chair: | | <i>Dragutin Debeljkovic, Tatjana Kolemisevska-Gugulovska</i> | |
| Gerence I Hall 14:00-16:00 | | Asymptotic Stability of Generalized Discrete Descriptive Time Delayed Systems D. Lj. DEBELJKOVIC, Lj. A. JACIC, N. S. VISNJIC, M. R. PLESIC | |
| | | Robust Finite Time Stability of Perturbed Nonlinear Fractional Order Time Delay Systems M. P. LAZAREVIC, D. Lj. DEBELJKOVIC | |
| | | Novel LMI Design of Variable Structure Control for Uncertain Time Delay Systems Y. MI, C. J. ANDREESKI, G. M. DIMIROVSKI | |
| | | Stability of Large-Scale Discrete Time-Delay Systems: Necessary and Sufficient Conditions S. B. STOJANOVIC, D. Lj. DEBELJKOVIC | |
| | | LMI Stability Criteria for TCP Networks with Time-Varying Delay M.-Y. YANG, Y.-W. JING, G. M. DIMIROVSKI | |
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| Session 2: | | SPECIAL PURPOSE CONTROLLER DESIGNS | |
| Chair: | | <i>Ernst Schneider, Ahmet Kuzucu</i> | |
| Gerence I Hall 16:30-18:30 | | Self-Ruled Fuzzy-Logic Based Controller K. O. YAPICI | |
| | | Fuzzy Multi-Objective Optimization And Its Application To Industrial Production Management P. VASANT, C. ANDREESKI | |
| | | Fuzzy Control of a Gantri Crane E. SCHNEIDER | |
| | | Highly-Accurate Pneumatic Position Control N. AKDAG, A. KUZUCU | |
| | | Specific Optimal Control of Erbium Doped Fiber Amplifiers N. PETROVACKI, Z. D. JELICIC | |
| | | Tuning Of Pid Controllers For A Robot Using Binary Genetic Algorithm I. HASSANZADEH, S. MOBAYEN | |
| | | Parallel Position/Force Controller for Tele-operation Systems M. I. CAN DEDE, S. TOSUNOGLU | |
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| May 17, 2007 Afternoon | | | |
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| Session 1: | | ENERGY AND POWER CONTROL DESIGNS | |
| Chair: | | <i>Bogdan Lewoc, Murat Sönmez</i> | |
| Gerence II Hall 14:00-16:00 | | Dynamic Ontology Based Approach for HVAC Control via Ant Colony Optimization M. HADJISKI, V. BOISHINA | |
| | | Fuzzy Logic-Based Tuning Controller for HVDC M. SONMEZ, KANDILLI, M. YAKUT | |
| | | Advanced Control for the Heating Installations C. LUPU, D. PETRESCU, M. TRUTA, C. Petrescu | |
| | | A Case Study: An Approach to Building Automation B. LEWOC, A. IZWORSKI, S. SKOWRONSKI, A. KIELECZAWA | |
| | | Control Philosophy for River Treska Cascade of Power Plants V. FUSTIK, N. KITEVA, D. KOCOVSKI | |
| | | Output Power Control of an Isolated Induction Generator Used for Charging the Battery R. SUERKAN, F. ARAS, I. KANDILLI, M. R. SONMEZ | |
| Session 2: | | AUTOMATION AND INFORMATION SYSTEMS | |
| Chair: | | <i>Numan Durakbaş, Todor Stoilov</i> | |
| Gerence II Hall 16:30-18:30 | | A Cooperative Enterprise Agent Based Control Architecture S. CRAMIHAI, I. DOUMITRACHE, A. STANESCU, J. CULITA | |
| | | Noniterative Bilevel Optimization K. STOILOVA, T. STOILOV | |
| | | The Influence of Ecology and Total Quality Management in European Industrial Production under the Pre-supposition of Intelligent Flexible Disassembly and Recycling of Used Products N. M. DURAKBASA, H. P. OSANNA, A. NOMAK-AKDOGAN, J. M. BAUER, L. KRAEUTER | |
| | | Some Problems with Technology Transfer in Lower Silesia B. LEWOC, A. IZWORSKI, S. SKOWRONSKI, A. KIELECZAWA | |
| | | Determining the Speed Controller Parameters in SIMOTION B. DEMIREL, O. T. KAYMAKCI | |
| | | A Neighbourhood Search Algorithm for a LOT Streaming Problem in a Flow Shop R. SANCAR, A. ORNEK | |
| | | Some Consideration about System Security and Computer Crime M. TRUTA | |
| | | An Integrated CAD/CAPP/CAM System for Rotating Parts A. DRESHA, J. KACANI, V. RAMAJ | |

| May 18, 2007 Morning | | | |
|---------------------------------|--|--|--|
| Session 1: | | SYSTEM IDENTIFICATION AND MODELLING | |
| Chair: | | Zhelko Juric, Erdem T. Senalp | |
| Okyanus Hall 08:30-10:30 | | Identification of Processes by Cascade Modeling Technique E. T. SENALP, E. TULUNAY, Y. TULUNAY | |
| | | Frequency Based Method for Parametric Identification of Hammerstein-type Plants Z. JURIC, B. PERUNICIC | |
| | | Modelling of Concentration of NO ₂ Using Support Vector Machines B. MILEVA-BOSKOVSKA, M. J. STANKOVSKI, T. D. KOLEMISEVSKA-GUGULOVSKA, V. OJLESKA | |
| | | Genetic Algorithm for Designing Fuzzy Rational Approximators O. BRUDARU, O. BUZATU | |
| | | Trigonometric Function Based Neural Networks for System Identification M. ALCI, S. BEYHAN | |
| | | Mathematical Modelling of Clinker Production in Cement Factories E. M. OMERDIC, N. M. PRLJACA, J. M. OSMIC | |
| Session 2: | | COMPLEX SYSTEM CONTROL AND MODELLING PROBLEMS | |
| Chair: | | Asif Sabanovic, Georgi Dimirovski | |
| Okyanus Hall 10:50-12:50 | | Controlling Interactions in Motion Control Systems M. ELITAS, A. SABANOVIC | |
| | | Decentralized Control of Time-Varying Complex Dynamical Networks with Similarity S.-Y. ZHONG, J. D. STEFANOVSKI, J. ZHAO, G. M. DIMIROVSKI | |
| | | Modelling and Optimization of Dolphin Swimming Movements B. KARACA, A. KUZUCU | |
| | | Robust H _∞ SMC for Uncertain Switched Linear Systems J. LIAN, J. ZHAO, T. D. KOLEMISEVSKA_GUGULOVSKA, G. M. DIMIROVSKI | |
| | | Synchronization of Complex Dynamical Networks Having Nonlinearly Coupled Nodes T. LIU, G. M. DIMIROVSKI, J. ZHAO | |

| May 18, 2007 Morning | | | |
|-----------------------------------|--|---|--|
| Session 1: | | MANIPULATION, BIPED, AND WHEELED ROBOTS | |
| Chair: | | Aleksandr Polyakov, Sergiu Dan-Stan, Özgün Başer | |
| Gerence I Hall 08:30-10:30 | | Planning of the Manipulator End-Effector Trajectory by Synergetic Criterion M. POLYAKOVA, A. POLYAKOV, M. KALININ | |
| | | Kinematic and Kinetic Considerations on a Stewart Platform in Terms of Workspace B. GUNERI, S. SARIGUL, H. KARAGULLE | |
| | | Dynamic Stress Analysis of a Robot Manipulator for Different End Point Trajectories M. AKDAG, Z. KIRAL | |
| | | Optimal Design of 2DOF Micro Parallel Robots S.-D. STAN, V. MATIES, R. BALAN | |
| | | Contribution to the Synthesis for a Biped Robot During the Single Support Phase A. PAJAZITI, I. GOJANI, A. SHALA, S. BUZA | |
| | | Joint Trajectory Control for a Biped Robot O. BASER, L. CETIN, E. UYAR | |
| Session 2: | | THEORETICAL ADVANCES IN NONLINEAR AND OPTIMAL CONTROL | |
| Chair: | | Leyla Gören Sümer, Dusan Petrovacki | |
| Gerence I Hall 10:50-12:50 | | On the Stabilization of Linear Port-Controlled Hamiltonian Systems via Static Feedback L. GOREN SUMER, | |
| | | Application of General Lagrange Functional to Quadratic Problems M. RAPAJIC, Z. D. JELICIC, D. PETROVACKI | |
| | | Open Loop Stable Systems under Proportional Controllers: Maximum Achievable Phase-Margin Calculation N. BAYHAN, M. T. SOYLEMEZ | |
| | | Control Method fro Nonlinear Processes: Multiple Models Algorithm versus Inverse Model Command C. LUPU, D. POPOESCU, M. TRUTA, C. PETRESCU, M. LUPU | |
| | | A Ratio Control Structure with Two Blend Stations E. YESIL, M. GUZELKAYA, I. EKSIN | |
| | | Influence Of Traction Current On Coefficient Of Friction And Creep Force For Wheel-Rail Contact S. B. GAVRILOVIC, R. VUKADINOVIC | |

| May 18, 2007 Morning | | | |
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| Session 1: | | FUZZY, NEURAL, AND FUZZY-NEURAL CONTROLS | |
| Chair: | | Metin U. Salamci, Aytaç Gören | |
| Gerence II Hall 08:30-10:30 | | A Fuzzy Model for Multistage Supply Chain System Controlled by KANBAN A. KOR, M. CAN | |
| | | Internal Model Control of a Fan and Plate System with a Fuzzy Tuning Mechanism A. DANCI, M. GUZELKAYA, I. EKSIN, E. YESIL | |
| | | Neuro-Fuzzy Controllers and Application to Autonomous Robots P. BOSKOVSKI, M. J. STANKOVSKI, B. MILEVA-BOSKOVSKA | |
| | | A Multi-Agent Neuro-Fuzzy Model to Control Road Traffic Flow A. SAHAN, T. YAKHNO | |
| | | Eliminating the Reaching Phase in the Sliding Mode Control for a Class of Nonlinear Systems E. Y. AVAN, M. U SALAMCI, S. P. BANKS | |
| | | Stability of a Class of Uncertain Fuzzy Systems Based on Fuzzy Controller Switching H. YANG, J. ZHAO, M. J. STANKOVSKI, G. M. DIMITROVSKI | |
| Session 2: | | PLANT MONITORING AND PROCESS AUTOMATION | |
| Chair: | | Stanislav Zemlyakov, Alberto Vale | |
| Gerence II Hall 10:50-12:50 | | Condition Supervision for Gas-Turbine Unit Transmissions on the Reference Model and Methods of Adaptive Filtration V. Y. RUTKOVSKY, V. M. SUKHANOV, S. D. ZEMLYAKOV, V. M. GLUMOV | |
| | | LIDAR Data Segmentation for Track Clearance Anomaly Detection on Over-Head Power Lines A. VALE, G. MOTA | |
| | | Online Vibration Monitoring of Machines in Cement Plant to Prevent Failures S. RAHMANOVIC, E. OMERICIC | |
| | | Simulation of Pneumatic Resistance in Series S. MAIER | |
| | | Systolic Array Based MVDR Beamformer O. TAMER, A. OZKURT | |
| | | Development of Control Strategy for Series Hybrid Electric Vehicle S. ABDUL-RAHMAN, M.-N. KARSITI, M.-S. MOHD, A.-R. A. AZIZ | |
| | | Flexible Manufacturing Cells for Wafer Manipulation in Solar Panel Manufacturing A. NICOLESCU, G. ENGIU | |

| May 18, 2007 Afternoon | | | |
|---------------------------------|--|---|--|
| Session 1: | | EDUCATION – GENERAL ISSUES | |
| Chair: | | EDUCATION – TEACHING AND TRAINING ISSUES | |
| Okyanus Hall 14:00-16:00 | | Peter Kopacek, Ruben Morales-Menendez, İbrahim Yüksel | |
| | | Mechatronics Education and Technology Transfer at Esslingen University of Applied Sciences R. WUERSLIN | |
| | | Mechatronics Education for Developing Countries: Example “Mechatronics Management” in Kosovo P. KOPACEK | |
| | | The Macedonian Credit System for Control Engineers T. D. KOLEMISEVSKA-GUGULOVSKA, M. J. STANKOVSKI, V. OJLESKA | |
| | | Integration of Control Applications in Mechatronic Education R. BALAN, V. MATIES, O. HANCU, S. STAN | |
| | | Teaching Sequential and Combinational Control Systems to Chemical Engineering Students R. MORALEZ-MENENDEZ, | |
| Okyanus Hall 16:30-17:30 | | A Scenario for Control Systems Module in Problem Based Electrical and Electronic Engineering Program M. OLMEZ, S. KILINC, A KOYUNCUOGLU, C. GUZELIS | |
| | | Automatic Control Teaching with a Process Control Unit for Undergraduate Students E. TOPCU, Z. KAMIS, I. YUKSEL | |
| | | Closing ceremony evaluation of DECOM07 and discussion for the coming 6th DECOM meeting | |

Total time per paper presentation is 20 minutes.(13-15 minutes for presentation and 5-7 minutes for discussion and questions)

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| | May 16th, 2007 |
| 13:00-20:00 | Registration |

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| | May 17th, 2007 |
| 09:00-10:30 | Welcome Ceremony |
| 10:30-11:00 | Coffee Break |
| 11:00-12:30 | Invited Speakers |
| 12:30-13:30 | Lunch Break |
| 14:00-16:00 | Presentations |
| 16:00-16:30 | Coffee Break |
| 16:30-18:30 | Presentations |
| 19:30-23:30 | Dinner + Turkish Night |

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| | May 18th, 2007 |
| 08:30-10:30 | Presentations |
| 10:30-10:50 | Coffee Break |
| 10:50-12:50 | Presentations |
| 12:50-13:50 | Lunch Break |
| 14:00-16:00 | Presentations |
| 16:00-16:30 | Coffee Break |
| 16:30-17:30 | Closing Ceremony |
| 18:30-19:45 | Dinner |
| 20:00-22:00 | Evening trip to Peninsula (Cesme&Alacati) |

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| | May 19th, 2007 |
| 08:30 | Departure from Hotel |
| 08:00-22:30 | Trip to Selçuk, Ephesus and House of Virgin Mary |