

meCHedu 2017

**4th International
CONFERENCE & WORKSHOP**

MECHATRONICS IN PRACTICE AND EDUCATION

PROCEEDINGS

4th International Conference and
Workshop Mechatronics in Practice and
Education

MECHEDU 2017

2017

4th International Conference and Workshop Mechatronics in Practice and Education

Published by Subotica Tech – College of Applied Sciences

Subotica, Serbia 4-5. May. 2017

About The Conference

MECHEDU was established within the framework of IPA cross-border program with the aim of promoting activities in various areas of mechatronics by providing a forum for exchange of ideas, presentation of technical achievements and discussion of future directions.

Previous MECHEDU conferences have drawn much attention and positive feedback from the participants. Therefore, Subotica Tech – College of Applied Sciences is organizing this Conference for the fourth time in partnership with the Faculty of Technical Sciences – Novi Sad, the Donát Bánki Faculty of Mechanical and Safety Engineering – Budapest, and the Faculty of Engineering – Szeged, and with a strong support of industry representatives from the area. This year also we are expanding the Conference to include a workshop that will highlight the significance of mechatronic structures in practice, presented by some of our cooperating partners from the industry.

We are confident that the MECHEDU 2017 Conference and Workshop will bring together an international community of experts from the wider region to discuss the latest research results, state-of-the-art technology, perspectives of future developments, and innovative applications relevant to mechatronics.

Topics of Interest (including, but not limited to)

- Advanced Manufacturing
- Control Management
- Didactic Equipment for Mechatronics
- Education in Mechatronics Engineering
- Human-Machine Interface
- Industry Applications
- Information Technology
- Intelligent Control
- Intelligent Systems
- Machine Vision
- Management in Mechatronics
- Micro-Electro-Mechanical Systems
- Modeling and Design
- Robotics and Mobile Platforms
- Safety in Mechatronics
- Sensors and Actuators and Networks

Chairmen

Igor Fürstner, Serbia
László Gogolák, Serbia

Scientific Committee

Zoran Anišić, Serbia
Mircea Bara, Romania
István Bíró, Hungary
Branislav Borovac, Serbia
Ilija Ćosić, Serbia
Zlatko Čović, Serbia
Dalibor Dobrilović, Serbia
Hironori Fuji, Japan
Stevan Fürstner, Serbia
Igor Fürstner, Serbia
László Gogolák, Serbia
Niko Heraković, Slovenia
Željko Ivandić, Croatia
Vukica Jovanović, USA
Imre Kiss, Romania
Dražan Kozak, Croatia
Siniša Kuzmanović, Serbia
Zoran Kunica, Croatia
Darko Knežević, Bosnia and Herzegovina
Tihomir Latinović, Bosnia and Herzegovina
Sanja Maravić Ćisar, Serbia
Goran Martinović, Croatia
Gyula Mester, Hungary
Péter Odry, Serbia
Gordana Ostojić, Serbia
Alin Plesa, Romania
Szilveszter Pletl, Serbia
Božidar Popović, Bosnia and Herzegovina
Zoltán Rajnai, Hungary
Mario Rodrigues, Portugal
Imre Rudas, Hungary
József Sárosi, Hungary
Ivana Šenk, Serbia
János Simon, Serbia
Dragan Šešlija, Serbia
Dan Stan, Romania
Mihály Stampfer, Serbia
Stevan Stankovski, Serbia
Róbert Sánta, Serbia
László Tarján, Serbia
Emil Teutan, Romania
István Vajda, Hungary
Xiaoshuan Zhang, China
Drago Žagar, Croatia

Organizing Committee

Sanja Maravić Čisar, Serbia
Zlatko Čović, Serbia
Atila Nađ, Serbia
József Sárosi, Hungary
János Simon, Serbia
Livia Szedmina, Serbia

Organizing Institution

Subotica Tech – College of Applied Sciences,
Subotica, Serbia

Conference Venue

Subotica, Serbia

TABLE OF CONTENTS

1. István Nagy - Advanced Mechatronics Education Concept Design at Bánki Faculty of Óbuda University	9
2. Zoltan Gobor - Finding the convex or non-convex hull of a random number of vertices – simple task?	14
3. Attila Trohak and David Kiss - Development of a go-kart based autonomous vehicle	20
4. Dijana Karuovic , Dusanka Milanov , Dragica Radosav and Stanoje Ivanović - Site Administration Using Bootstrap	24
5. Laszlo Schaffer , Szilveszter Pletl and Zoltan Kincses - Implementation of an FPGA-based actual observer for active suspension control	28
6. Ferenc Farkas and Tamas Molnar - The changing of the landfill gas'quality parameters in the function of applied depression	33
7. Peter Sarcevic , Szilveszter Pletl and Zoltan Kincses - Examining the number of required stationary orientations for efficient accelerometer calibration	38
8. Dražan Kozak , Zoran Vrhovski and Goran Benkek - Automated Warehouse: Student Project within Courses Mechanisms and Microcomputers at the Technical College in Bjelovar	42
9. Róbert Sánta and Igor Fürstner - Comparison of two heat-pump systems -with and without an internal exchanger	47
10. Aleksandar Poznić and Boris Stojić - Novel magnetorheological brakes` simulation	52
11. Miklós Póth - Comparison of spatial and frequency domain image compression methods	57
12. László Gogolák and Igor Fuerstner - Improvement proposals in student projects for prototype technical documentation	61
13. Laslo Tarjan , Ivana Senk , Branislav Tejic , Dragana Oros and Igor Baranovski - Simulation of Hall sensor based localization in a production process	67
14. Janos Simon , Zlatko Čović and Imre Petkovics - Industrie 4.0 Based Customized Mass Production Overview	72
15. Szabolcs Földi and Attila Trohák - Energy Efficiency In Continuous Technology	77
16. Attila Trohák , Róbert Simon and Zsófia Forgács - Development of Facility Monitoring System in the Contest of Supervisor Control	81
17. Eugen Cicvarić and Zoran Kunica - The Automation of the Painting Process	85

18. Sandor Csikos, Szabolcs Balassa and Jozsef Sarosi - Fuzzy Control of an Antagonistic System Driven by Pneumatic Muscle Actuators	89
19. Petar Cisar and Sanja Maravic Cisar - An overview of Android application security	93
20. Attila Szenci, Szilveszter Fejes, Andrea Raffai and Róbert Pintér - Advanced technologies usage in energetics	96
21. Dalibor Dobrilovic, Aleksandar Berar, Zeljko Stojanov, Nikola Petrov and Zlatko Covic - Building ESP8266 Wi-Fi module network based on open-source hardware and single-board computers	101
22. Nenad Medić, Zoran Anisic and Saša Tešić - Survey of some Key Concepts of Industry 4.0 in Manufacturing Companies from Developing Country	107
23. Zsófia Forgács and Attila Trohák - Preparation of a Machine Vision System's Environment for an Automotive Manufacturing Technology Research	112
24. Sergiu-Dan Stan, Alin Plesa, Emil Teutan and Mircea Bara - Control and Testing of a New Soft Pneumatic Gripper with Optimised Design for Soft Robotics	116

PROGRAM

Thursday, May 4. Subotica Tech,

Event	Room	Time
Registration – Talk with Sponsors	Hall	9:00 - 9:45
Conference Opening Session	A0	10:00 - 10:15
István Nagy - <i>Advanced Mechatronics Education Concept Design at Bánki Faculty of Óbuda University</i>		10:15 - 10:30
Workshop Session	A0	10:30 – 12:15
Robert Klačak (FANUC Adria) – <i>Working hand in hand: The present and Future of the Industrial and Collaborative Robotics</i>		10:30 - 11:15
Lóránt Horváth (Process Automatika) - <i>PASS The new generation of SCADA</i>		11:15 - 11:45
Zsolt Varga (Dunkermotoren) – <i>Smart motors, the future of servo systems</i>		11:45 - 12:15
Group Photo		12:15
Lunch	Hall	12:30 - 13:30
Conference Session I	206	13:30 - 15:30
Coffee Break	Hall	15:30 - 16:00
Conference Session II	206	16:00 - 18:00
Conference Gala Dinner (Hotel Galleria, Restaurant Panorama)		19:00-24:00

Friday, May 5. Subotica Tech,

Event	Room	Time
Student and Poster Session	Hall	10:00 - 11:00
Lunch and Excursion (Lake Palic)		11:00 – 15:30
Conclusions and Conference Closing Ceremony		14:00

Sponsors and Partners:



Conference Session I

Chair: Dalibor Dobrilovic, Laslo Tarjan	Time
Zoltan Gobor - Finding the convex or non-convex hull of a random number of vertices – simple task?	13:30
Attila Trohak and David Kiss - Development of a go-kart based autonomous vehicle	13:45
Sergiu-Dan Stan, Alin Plesa, Emil Teutan and Mircea Bara - Control and Testing of a New Soft Pneumatic Gripper with Optimised Design for Soft Robotics	14:00
Laszlo Schaffer, Szilveszter Pletl and Zoltan Kincses - Implementation of an FPGA-based actual observer for active suspension control	14:15
Ferenc Farkas, Tamas Molnar - The changing of the landfill gas'quality parameters in the function of applied depression	14:30
Stevan Stankovski, Gordana Ostojić, Nikola Djukić, Igor Baranovski and Dragana Oros - Introducing Fieldbus Technology in a Mechatronics Curriculum	14:45
Dijana Karuovic, Dusanka Milanov, Dragica Radosav and Stanoje Ivanović - Site Administration Using Bootstrap	15:00
Peter Sarcevic, Szilveszter Pletl and Zoltan Kincses - Examining the number of required stationary orientations for efficient accelerometer calibration	15:15

Conference Session II

Chair: Zoltan Gobor, Dan Stan	Time
Eugen Cicvarić and Zoran Kunica - The Automation Of The Painting Process	16:00
Zsófia Forgács and Attila Trohák - Preparation of a Machine Vision System's Environment for an Automotive Manufacturing Technology Research	16:15
Szabolcs Földi and Attila Trohák - Energy Efficiency In Continuous Technology	16:30
Dalibor Dobrilovic, Aleksandar Berar, Zeljko Stojanov, Nikola Petrov and Zlatko Covic - Building ESP8266 Wi-Fi module network based on open-source hardware and single-board computers	16:45
Miklós Póth - Comparison of spatial and frequency domain image compression methods	17:00
Attila Trohák, Róbert Simon and Zsófia Forgács - Development of Facility Monitoring System in the Contest of Supervisor Control	17:15
Petar Cisar and Sanja Maravic Cisar - An overview of Android application security	17:30

Poster and Student Section

Chair: József Sárosi, János Simon	Time
Aleksandar Poznić and Boris Stojić - Novel magnetorheological brakes` simulation	10:00
Laslo Tarjan, Ivana Senk, Branislav Tejic, Dragana Oros and Igor Baranovski - Simulation of Hall sensor based localization in a production process	
Sandor Csikos, Szabolcs Balassa and Jozsef Sarosi - Fuzzy Control of an Antagonistic System Driven by Pneumatic Muscle Actuators	
Attila Szenci, Szilveszter Fejes, Andrea Raffai and Róbert Pintér : Advanced technologies usage in energetics	
Dražan Kozak, Zoran Vrhovski and Goran Benkek - Automated Warehouse: Student Project within Courses Mechanisms and Microcomputers at the Technical College in Bjelovar	
Janos Simon, Zlatko Čović and Imre Petkovics : Industry 4.0 Based Customized Mass Production Overview	
Róbert Sánta and Igor Fürstner : Comparison of two heat-pump systems -with and without an internal exchanger	
Nenad Medić, Zoran Anisic and Saša Tešić - Survey of some Key Concepts of Industry 4.0 in Manufacturing Companies from Developing Country	
László Gogolák, Igor Fürstner - Improvement proposals in student projects for prototype technical documentation	
Student work series – Supervisors: József Sárosi, Igor Fürstner, László Gogolák	