

Program

Sunday – 2 February, 2025

17:00 – 18:30 **Registration**

18:30 – 20:00 Dinner

Monday – 3 February, 2025

7:00 – 8:30 **Breakfast**

8:00 – 8:30 **Registration**

8:40 – 9:10 **Conference Opening**

9:15 – 10:00 **P1 – Plenary Session**

Chair: L. Hluchý

P1.1 PETRI NETS AND OBJECT-CENTRIC PROCESSES IN SOFTWARE
ENGINEERING

Gabriel Juhás

10:00 – 10:20 **Coffee Break**

10:20 – 12:00 **A1 – Applied Informatics I**

Chair: J. Lacko

A1.1 DECENTRALIZATION IN INDUSTRY 4.0 SUPPORTED BY OPC UA
MULTI-DOMAIN INFORMATION MODELS: CASE STUDY AND
IMPLEMENTATION CHALLENGES

Rudolf Pribiš, Lukáš Beňo, Martin Pajpach, Peter Drahoš and Ondrej Kocák

A1.2 SIMULATION AND OPTIMIZATION OF FOAMING CABINS UTILIZATION
ON THE PRODUCTION LINE

Ján Cigánek and Marián Choma

A1.3 DOCKER SURVEY FOR FLOPS EFFICIENCY

Michal Staňo, Ladislav Hluchý, Peter Krammer and Michal Hucko

A1.4 SIMULTANEOUS HIGH-SPEED DEPTH MEASUREMENT AND VIDEO
PRESENTATION USING A VIDEO-RATE PROJECTOR EV

Leo Miyashita and Masatoshi Ishikawa

A1.5 MYSTERY OF THE PIXEL: EDUCATIONAL GAME ON BASIC OF
COMPUTER VISION

Oto Haffner, Eunika Farkašová, Michal Balla and Erik Kučera

10:20 – 12:00

B1 – Modelling and Control I

Chairs: R. Bars, A. Kozáková

B1.1 DISCRETE CONTROL ALGORITHMS FOR SYSTEMS WITH BIG DEAD TIME FOR CONTROL101 MATLAB TOOLBOX

Ruth Bars, Gyula Max, J. Anthony Rossiter and László Keviczky

B1.2 AUTOMATIC ROBUST CONTROL DESIGN FOR A LABORATORY SYSTEM

Mária Hypiúsová and Danica Rosinová

B1.3 SYSTEM-STATE CONSTRAINED STATIC OUTPUT CONTROL FOR LINEAR POSITIVE DISCRETE-TIME SYSTEMS

Dušan Krokavec and Anna Filasová

B1.4 INTEGRATED TESTING OF MODEL PREDICTIVE CONTROL ON INDUSTRIAL PLC

Dušan Horváth, Riccardo Bacci di Capaci, Maximilián Strémy and Gabriele Pannocchia

B1.5 A DATA-BASED MODEL PREDICTIVE CONTROL APPROACH FOR ENHANCING ENERGY EFFICIENCY IN AN AIR-COOLED DATACENTER

Mohammed Amokrane Mahdi and David Nörtershäuser

12:15

Lunch

13:30 – 17:00

[Social Program \(guided tour in Mikulov\)](#)

17:30 – 18:30

C1 – Posters

Chair: P. Drahoš

C1.1 NARROWBAND BEAMFORMING USING PHASE SHIFTERS ON FPGA: A MODEL-BASED DESIGN APPROACH WITH HARDWARE/SOFTWARE CO-IMPLEMENTATION

Hamza Murat Yilmaz and Berna Örs

C1.2 WEB APPLICATION FOR DYNAMIC VIDEO TRANSCODING USING AZURE FUNCTIONS

Lukáš Beňo, Rudolf Pribiš, Peter Drahoš and Samuel Balaščík

C1.3 ADDRESSING PRACTICAL LIMITATIONS IN DC MOTOR SPEED CONTROL

Štefan Chamraz and Richard Balogh

C1.4 PROBABILITY INTEGRAL BASED POST-PROCESSING FOR PHOTONIC QUANTUM RANDOM NUMBER GENERATORS

Balázs Solymos and László Bacsardi

C1.5 A SIMULATION APPROACH TO IMPROVE THE PERFORMANCE OF A SUB-ASSEMBLY ZONE IN AUTOMOTIVE INDUSTRY Monika Herchlová, Pavel Važan, Fedor Burčiar, Martin Juhás, Bohuslava Juhásová and Dominik Čambál

C1.6 A SIMULATION MODEL OF AIR LEVITATION FOR REINFORCEMENT LEARNING APPLICATIONS
Michal Hlavatý, Alena Kozáková, Štefan Kozák and Gabriel Gálik

19:00 – 22:00 **Gala Dinner**

Tuesday – 4 February, 2025

7:30 – 10:00 Breakfast

8:30 – 12:30 **Social Program (walking tour to Calvary)**

12:30 Lunch

13:15 – 13:45 P2 – Plenary Session II

Chair: J. Cigánek

P2.1 ADAPTING TECHNOLOGY TO THE POST-QUANTUM AND HYBRID WARFARE ERA: KEY RESEARCH TRENDS AND THE ROLE OF THE 6G PHYSEC P
Peter Farkaš

14:00 – 15:40 A2 – Applied Informatics II

Chairs: E. Ružický, J.R. Dora

A2.1 VIRTUAL INFRASTRUCTURE MANAGEMENT
Andrej Tkáč and Martin Bobak

A2.2 ATTACKS ON ACTIVE DIRECTORY - RESOURCE-BASED CONSTRAINED DELEGATION AND NEW PATCHEServerless COMPUTING AND FAAS FOR AIRPORT METEOROLOGY
Jean Rosemond Dora, Jean Rosemond Dora and Ladislav Hluchy

A2.3 PROPOSAL FOR IMPLEMENTATION OF SOFTWARE-GENERATED 3D IDENTIFIERS IN LOGISTICS
Kamil Kušnirák, Ondrej Kolimár, Oto Haffner and Erik Kučera

A2.4 DEVELOPMENT OF AN INTERACTIVE VR APPLICATION USING UNITY: ITS IMPACT ON LEARNING AND PERFORMANCE
Dominik Janecký, Erik Kučera, Oto Haffner and Lenka Hricková

A2.5 USING VIRTUAL REALITY TO MONITOR WORKER STRESS AND FATIGUE IN INDUSTRY
Eugen Ružický, Ján Lacko, Štefan Kozák, Miron Šramka and Michal Čerešník

14:00 – 15:40

B2 – Modelling and Control for Electromobility

Chair: R. Balogh

B2.1 VOLTAGE CONTROL IN PV DISTRIBUTION NETWORKS WITH EV CHARGING

Saurabh Ratra, Rajive Tiwari and Praveen Agarwal

B2.2 MULTIPHYSICS MODEL OF A BATTERY MODULE

Milan Plzák, Martin Baťa, Juraj Paulech, Gabriel Gálik, Michal Miloslav Uličný, Šimon Berta and Andrej Üрге

B2.3 OPTIMAL PLACEMENT OF ELECTRIC VEHICLE CHARGING STATIONS AND DISTRIBUTED GENERATION IN DISTRIBUTION NETWORKS USING GENETIC ALGORITHM

Rahul Tailor, Mukesh Shah and Kr Niazi

B2.4 HYDROGEN FUEL CELL SYSTEM MODELING APPROACHES

Rastislav Putala and Viktor Ferencey

B2.5 FAST CHARGING STATION PLANNING FRAMEWORK WITH BATTERY SWAPPING FACILITIES: A TECHNO-ECONOMIC APPROACH

Shakti Vashisth, Praveen Kumar Agrawal, Nikhil Gupta, Bhuvan Sharma, Anil Swarnkar and Khaleequr Niazi

15:40 – 16:00

Coffee Break

16:00 – 17:40

C2 – Artificial Intelligence I

Chair: Z. Képešiová, Š. Kozák

C2.1 ADAPTIVE NEURO FUZZY INFERENCE SYSTEM FOR PROGRAMMABLE LOGIC CONTROLLER

Ladislav Kőrösi, Jana Paulusová and Oliver Halaš

C2.2 AN EFFECTIVE DEEP LEARNING APPROACH FOR FAULT DETECTION AND CLASSIFICATION OF LEVITATION PROCESSES

Zuzana Képešiová and Štefan Kozák

C2.3 INFLAMMATORY BOWEL DISEASES DETECTION USING FEW-SHOT LEARNING

Jinan Fiaidhi and Sabah Mohammed

C2.4 COMPARISON OF DEEP REINFORCEMENT METHODS AND NEUROEVOLUTION FOR BIPEDAL WALKER LEARNING

Oliver Halaš, Filip Zúbek and Ivan Sekaj

C2.5 WHAT IF LLM DOESN'T KNOW
Rastislav Tvarožek and Oto Haffner

16:00 – 17:40

D2 – Control Applications and Informatics II

Chairs: P. Ľapák, O. Haffner

D2.1 REAL-TIME SERVO CONTROL WITH GESTURE RECOGNITION ON
NVIDIA JETSON USING CNNSD
Ladislav Körösi, Slavomir Kajan, Michal Kováč, Jaromír Skirkanič and Ivan
Sekaj

D2.2 PROPOSAL FOR PETRI NETS UTILISATION IN THE CONTROL OF
MECHATRONIC SYSTEMS WITH OPC UA SUPPORT Kamil Kušnirák,
Ondrej Kolimár, Oto Haffner and Erik Kucera

D2.3 FILAMENT QUALITY METER FOR FDM 3D PRINTER
Peter Ľapák and Kristof Berta

D2.4 A FRACTIONAL-ORDER PI CONTROLLER IMPLEMENTATION ON
A PLC
Igor Bélai and Igor Bélai Jr.

D2.5 IMPROVED NUMERICAL METHOD FOR POLYNOMIAL ROOTS
IDENTIFICATION IN MATLAB
Peter Krammer, Ondrej Habala and Ladislav Hluchý

16:00 – 17:20

E2 – Informatics in Electromobility

Chair: M. Baťa

E2.1 COST BENEFIT ANALYSIS OF ELECTRIC VEHICLE CHARGING
STATIONS BY USING ENERGY MANAGEMENT SYSTEM
Rahul Tailor, Mukesh Shah and Kr. Niazi

E2.2 IMPACT ANALYSIS OF DRIVING CYCLES ON ELECTRIC BUS
BATTERY DEGRADATION DURING LIFECYCLE
Martin Baťa and Juraj Majera

E2.3 AN OPTIMIZED MULTI CARRIER ENERGY SYSTEM OPERATION WITH
INTEGRATED POWER-TO-GAS AND GAS-TO-POWER TECHNOLOGIES
Ankit Garg, Khaleequr Rehman Niazi and Sachin Sharma

E2.4 ENHANCEMENT IN GRID PERFORMANCE USING COORDINATED V2G
APPROACH WITH RESIDENTIAL EV CHARGING DEMAND
Shakti Vashisth, Seema Bairwa, Anil Swarnkar, Praveen Kumar Agrawal
and Nikhil Gupta

E2.5 DATA-DRIVEN MACHINE LEARNING MODELS FOR STATE OF HEALTH
ESTIMATION OF LITHIUM-ION BATTERIES
Vedveer Singh Choudhary, Sandeep Bikundia and Rajjive Tiwari

18:00 Dinner
19:00 – 21:30 [Social Program](#)

Wednesday – 5 February, 2025

7:30 – 9:00 Breakfast

9:00 – 11:00 **A3 – Applications**

Chair: M. Kocúr

- A3.1 DESIGN AND IMPLEMENTATION OF AN APPLICATION FOR A DRAW PROCEDURE
Ján Cigánek and Marián Choma
- A3.2 GRAPH-LANGUAGE DUAL APPROACH TO DISCRETE DYNAMIC EVENT SYSTEMS
Juraj Štefanovič
- A3.3 LOW-COST AUTOMATED 3D RECONSTRUCTION USING PHOTOGRAMMETRY AND COLLABORATIVE ROBOT
Martin Michalovič, Oto Haffner and Erik Kučera
- A3.4 RECONSTRUCTION OF A 3D MODEL USING MONOCULAR DEPTH ESTIMATION ALGORITHM
Richard Schwarz
- A3.5 RECOGNITION OF THE COUNTERFEIT ARDUINO CHIPS
Richard Balogh
- A3.6 A DUAL-CAMERA ANALYSIS OF PCA COEFFICIENTS FOR HYPERSPECTRAL CLASSIFICATION OF TREE SPECIES
Bianca Badidová, Radoslav Forgáč, Miloš Očkay, Martin Javurek, Peter Krammer and Ladislav Hluchý
- A3.7 ALGEBRAIC CONTROLLERS DESIGN FOR A LOW-COST ARDUINO-BASED EXPERIMENTAL DEVICE
Matej Hanzalík and Alena Kozáková

9:00 – 10:00 **B3 – Information & Communication Technologies**

Chair: M. Bobák

- B3.1 ASSET ADMINISTRATION SHELL – KEY-ENABLING TECHNOLOGY OF INTEROPERABILITY IN INDUSTRY 4.0
Martin Pajpach, Michal Šlauka, Rudolf Pribiš, Peter Drahoš, Erik Kučera and Oto Haffner

B3.2 THERMAL PERFORMANCE ANALYSIS OF A SINGLE BATTERY CELL:
EXPERIMENTAL AND SIMULATION APPROACHES WITH ACTIVE
COOLING

Michal Miloslav Uličný, Martin Baťa, Šimon Berta, Gabriel Gálik, Juraj
Paulech, Milan Plzák and Andrej Üрге

B3.3 THE SYNERGY OF MAN AND MACHINE: THE NEW HUMAN-CENTRIC
DIMENSION OF DIGITAL TWIN

Michal Balla, Oto Haffner, Erik Kučera and Martin Pajpach

10:00 – 11:20

C3 – Artificial Intelligence II

Chair: E. Kučera, M. Pajpach

C3.1 EVALUATION OF MOTION-CAPTURE SUIT DATA AND GESTURE
RECOGNITION USING LSTM AND GRU NEURAL NETWORKS

Erik Kučera, Oto Haffner, Myroslava Shevska and Dominik Janecký

C3.2 INTERSECTION MODEL CONTROL USING MACHINE LEARNING
METHODS

Jaromír Skirkanič, Ivan Sekaj and Slavomír Kajan

C3.3 OPTIMIZATION OF ACTIVE SUSPENSION CONTROL USING PARTICLE
SWARM OPTIMIZATION

Daniel Pacek, Danica Rosinová and Juraj Račkay

C3.4 WELD DEFECT RECOGNITION AND DETECTION FROM VIDEO USING
DEEP LEARNING METHODS

Slavomír Kajan, Marek Trebuľa, František Duchoň, Zuzana Kovariková,
Michal Kováč and Jarmila Pavlovičová

11:20

P3 – Plenary Session III

Chair: D. Rosinová

P3.1 FROM INDUSTRY 4.0 TO INDUSTRY 5.0: CURRENT TRENDS IN
RESEARCH AND EDUCATION

Štefan Kozák, Eugen Ružický and Ján Lacko

Conference Closing

12:00

Lunch