Conference Program

Wednesday – 29 January, 2020

17:00 – 18:30 Registration
18:30 – 20:00 Dinner

Thursday – 30 January, 2020

7:00 – 8:30 Breakfast
8:00 – 8:40 Registration
8:40 – 8:50 Conference Opening

8:50 – 10:00 **P1 – Plenary Session**

Chair: M. Huba

P1.1 FROM PID TO THE MACHINE AND DEEP LEARNING CONTROL
Štefan Kozák

P1.2 STATE OF THE ART IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Michal Gregor

P1.3 POPULARIZATION OF MECHATRONICS BY FAN FILM INSPIRED BY AVENGERS: INFINITY WAR
Erik Kučera et al.

10:00 – 10:20 Coffee Break

10:20 – 12:00 **A1 – Control Engineering Methods I**

Chair: T. Puleva

A1.1 IMPROVING NOISE ATTENUATION IN MODIFIED FILTERED SMITH PREDICTOR
Mikuláš Huba and Damir Vrančič

A1.2 STOCHASTIC ALGORITHMS FOR SPEED AND POWER CONTROL OF WIND TURBINE GENERATOR
Teofana Puleva and Ognyana Ognyanova

A1.3 TIME TRANSFORMATION AND ROBUSTNESS OF PI CONTROLLER TUNING FOR INTEGRATING PLANTS WITH TIME DELAY
Miluše Vítečková, Antonín Víteček and Dagmar Janáčová

A1.4 MODIFIED INTEGRAL SLIDING MODE CONTROL OF MOTION SYSTEM
Ján Kardoš

A1.5 IDENTIFICATION AND CONTROL OF A CASCADE OF BIOCHEMICAL REACTORS
Matúš Furka, Karol Kiš, Michaela Horváthová, Martin Mojto and Monika Bakošová

10:20 – 12:00 **B1 – Application of Control Methods**

Chair: P. Papcun

B1.1 ENSEMBLE DEEP LEARNING MODELS FOR ECG-BASED BIOMETRICS
Yeong-Hyeon Byeon, Sung Bum Pan and Keun-Chang Kwak

B1.2 INTELLIGENT SPACE DESIGN FOR ROBOTIC AND IOT APPLICATIONS
Ján Vaščák, Peter Papcun, Iveta Zolotová and Michal Puheim

B1.3 THE PROBLEMS RELATED TO REALIZATION OF SAFETY FUNCTION WITH SIL4 USING PLC
Karol Rástočný, Juraj Ždánsky and Jozef Hrbček

B1.4 ANDROID APPLICATION FOR PERIODICAL VEHICLE INSPECTION
Peter Ťapák, Michal Kocúr, Matej Rábek and Juraj Matej

B1.5 MULTIPLATFORM MOBILE APPLICATION FOR IDENTIFICATION AND LOCALIZATION OF OBJECTS IN SPACE
Oto Haffner and Erik Kučera

10:20 – 12:00 **C1 – Information and Communication Systems I**

Chair: P. Drahoš

C1.1. ANALYSIS OF PARASITIC AND LOSS ELEMENTS INFLUENCE ON RFID LOOP ANTENNA QUALITY FACTOR
Peter Vestenický

C1.2 TEACHING IOT USING RASPBERRY PI BASED RC-CAR
Pavol Bisták, Reza Moezzi, Francesco Semeraro and Giuseppina Nicassio

C1.3 IO-LINK FIELD PARAMETERIZATION FOR DATA COLLECTION BASED ON RFID TECHNOLOGY
Marek Vagaš, Alena Galajdová and Dušan Šimšík

C1.4 AN INDUSTRIAL COMMUNICATION PLATFORM FOR INDUSTRY 4.0 - CASE STUDY
Rudolf Pribiš, Lukáš Beňo and Peter Drahoš

C1.5 SKYBAT: A SWARM ROBOTIC MODEL INSPIRED BY FISSION-FUSION BEHAVIOUR OF BATS
Ivana Budinská

12:00 **Lunch**

13:00 – 17:00 **Social Program**

17:30 – 18:30 **D1 – Posters**

Chair: P. Bisták

D1.1 ROBUST PI CONTROLLER DESIGN FOR POSITIVE SYSTEMS
Jana Paulusová, Vojtech Veselý and Martin Paulus

D1.2 DESIGN AND ANALYSIS OF THE MODIFIED IMC FILTER FOR DISTURBANCE REJECTION
Štefan Chamraz and Richard Balogh

D1.3 3D MODEL OF THE THERMO-OPTO-MECHANICAL PLANT FOR USE IN CONTROL EDUCATION
Michal Podroužek, Jakub Matišák and Katarína Žáková

D1.4 CONTROL OF CE152 MAGNETIC LEVITATION: LINEARLY CHANGING CONTROL SIGNAL
Štefan Chamraz and Katarína Žáková

D1.5 WEBGL PRESENTATION OF THREE TANK SYSTEM
Marek Bláha and Katarína Žáková

D1.6 PROCESSING AND VISUALIZATION OF MEDICAL DATA IN A MULTIUSER ENVIRONMENT USING ARTIFICIAL INTELLIGENCE
Eugen Ružický, Ján Lacko, Juraj Štefanovič, Július Hlaváč and Miron Šramka

D1.7 BASIC PARAMETERS OF COILED FISHING LINE ACTUATOR
Martin Minár, Vladimír Goga, Romana Čápková, Kristián Ondrejička and Justín Murín

D1.8 2 DOF LINEAR MECHANICAL SYSTEM – PARAMETER IDENTIFICATION
Vladimír Goga, Martin Minár and Justín Murín

D1.9 ROBUST TIME-SPACE CONTROL OF TEMPERATURE FIELD IN CONTINUOUS CASTING PROCESS
Cyril Belavý, Lukáš Bartalský, Dana Šišmišová and Gabriel Hulkó

D1.10 ROBUST QFT-BASED CONTROL OF THE DC MOTOR LABORATORY MODEL
Romana Čápková, Alena Kozáková, Martin Minár and Kristián Ondrejička

D1.11 LABORATORY ABS CONTROL: FUZZY OR PID CONTROLLER?
Danica Rosinová and Alena Kozáková

D1.12 COMPARISON OF STATE FEEDBACK CONTROLLERS FOR THE MAGNETIC LEVITATION SYSTEM
Mária Hypiusová, Danica Rosinová and Alena Kozáková

D1.13 MACHINE LEARNING AND BUSINESS INTELLIGENCE OR FROM DESCRIPTIVE ANALYTICS TO PREDICTIVE ANALYTICS
Július Hlaváč and Juraj Štefanovič

D1.14 NAVIGATION OF THE MOBILE ROBOTS USING THE RTLS TECHNOLOGY IMPLEMENTED IN THE ROS
Juraj Slovák, Petra Kurčová, Jan Vachálek and Ivan Fiťka

18:30 – 19:00 International Premiere:
A FAN FILM INSPIRED BY AVENGERS: ENDGAME

19:00 – 22:00 **Welcome Party**

Friday – 31 January, 2020

7:30 – 10:00 **Breakfast**
8:30 – 12:30 **Social Program**
12:30 **Lunch**

14:00 – 15:40 **A2 – Control Engineering Methods II**
Chair: K. Žáková

A2.1 IMPLEMENTATION OF THE EXTENDED KALMAN FILTER USING MATLAB SYMBOLIC TOOLBOX
Dušan Nemec, Marián Hruboš, Michal Gregor, Aleš Janota and Jozef Hrbček

A2.2 MODELING AND CONTROL OF HIGHLY NONLINEAR COMPLEX PROCESS
Peter Karas and Štefan Kozák

A2.3 FAULT TOLERANT CONTROL WITH MULTIPLE MODELS AND OUTPUT COMPENSATION. APPLICATION FOR SERVO SYSTEM
Alexandar Ichtev

A2.4 ROBUST INTERVAL PID CONTROLLER DESIGN
Jakub Osuský, Alena Kozáková and Danica Rosinová

A2.5 LOGARITHMIC ADDITION AND SUBTRACTION FOR EMBEDDED CONTROL SYSTEMS
Peter Drahoš and Michal Kocúr

14:00 – 15:40 **B2 – Artificial Intelligence**

Chair: J. Cigánek

B2.1 PERFORMANCE EVALUATION OF DISTRIBUTED MACHINE LEARNING FOR LOAD FORECASTING IN SMART GRIDS
Dabeeruddin Syed, Shady S. Refaat and Haitham Abu-Rub

B2.2 DRIVER DROWSINESS DETECTION USING CONVOLUTIONAL NEURAL NETWORKS
Zuzana Képešiová, Ján Cigánek and Štefan Kozák

B2.3 COMPARISON OF ALGORITHMS FOR DYNAMIC HAND GESTURE RECOGNITION
Slavomír Kajan, Jozef Goga and Ondrej Zsíros

B2.4 DETECTION OF DIABETIC RETINOPATHY USING PRETRAINED DEEP NEURAL NETWORKS
Slavomír Kajan, Jozef Goga, Kristián Lacko and Jarmila Pavlovičová

B2.5 DISTRIBUTED COMPUTING FOR SMART METER DATA MANAGEMENT FOR ELECTRICAL UTILITY APPLICATIONS
Ameema Zainab, Shady S. Refaat and Haitham Abu-Rub

14:00 – 15:40 **C2 – Information and Communication Systems II**

Chair: T. Páleník

C2.1 ACCELERATING WEIGHT SPECTRUM CALCULATION OF LINEAR BLOCK CODES DEFINED OVER GF(Q) USING GPU
Tomáš Páleník and Peter Farkaš

C2.2 INFLUENCE OF SRCS ARCHITECTURE ON POSSIBILITY TO ACHIEVE REQUIRED SAFETY INTEGRITY LEVEL OF SAFETY FUNCTION
Jozef Valigurský

C2.3 PERFORMANCE ANALYSIS OF GENERALIZED METROPOLIS-HASTINGS ALGORITHM OVER MOBILE WIRELESS SENSOR NETWORKS
Martin Kenyeres and Jozef Kenyeres

C2.4 MODEL OF INTEGRATION GATEWAY FOR COMMUNICATION OF OPC/MQTT DEVICES
Peter Peniak, Emília Bubeníková and Juraj Spalek

C2.5 ADAPTER IMPLEMENTATION INTO MOZILLA WEBTHINGS IOT PLATFORM USING JAVASCRIPT
Erich Stark, Erik Kučera, Oto Haffner and Alena Kozáková

15:40 – 16:00 **Coffee Break**

16:00 –17:20 **A3 – Mechatronical System Applications**

Chair: C. Belavý

A3.1 LOW COST MANNER OF GAINING CAR POSITION UTILIZING ODOMETRY, MEMS GYROSCOPE AND MAGNETOMETER
Vojtech Šimák, Dušan Nemec, Jozef Hrbček and Emília Bubeníková

A3.2 MEASURE DISTANCE BETWEEN CAMERA AND OBJECT USING CAMERA SENSOR
Frederik Valocký, Peter Drahoš and Oto Haffner

A3.3 EXPERIMENTAL MODELLING OF PROTON EXCHANGE MEMBRANE FUEL CELL VOLTAGE LOSSES
Kristián Ondrejička, Romana Čápková, Martin Minár and Mikuláš Huba

A3.4 SALES PREDICTION OF SVIJANY SLOVAKIA, LTD. USING MICROSOFT AZURE MACHINE LEARNING AND ARIMA MODEL
Oto Haffner, Erik Kučera and Michal Moravčík

16:00 –17:40 **B3 – Virtual and Augmented Reality**

Chair: J. Lacko

B3.1 MULTIMEDIA APPLICATION FOR OBJECT-ORIENTED PROGRAMMING EDUCATION DEVELOPED BY UNITY ENGINE
Erik Kučera, Oto Haffner and Roman Leskovský

B3.2 HEALTH SAFETY TRAINING FOR INDUSTRY IN VIRTUAL REALITY
Ján Lacko

B3.3 CONTROL AND MONITORING OF IOT DEVICES USING MIXED REALITY DEVELOPED BY UNITY ENGINE
Szabina Bucsai, Erik Kučera, Oto Haffner and Peter Drahoš

B3.4 PROCESSING AND VISUALIZATION OF MEDICAL IMAGES USING MACHINE LEARNING AND VIRTUAL REALITY
Ján Cigánek and Zuzana Képešiová

B3.5 PROPOSAL OF DIGITAL TWIN PLATFORM BASED ON 3D RENDERING AND IIOT PRINCIPLES USING VIRTUAL / AUGMENTED REALITY
Roman Leskovský, Erik Kučera, Oto Haffner and Danica Rosinová

18:00 **Dinner**

19:00 – 21:30 **Social Program**

Saturday – 1 February, 2020

7:30 – 9:00 **Breakfast**

9:00 **Conference Closing**