INES 2021 TECHNICAL PROGRAM

Zoom link: https://zoom.us/j/98679759546 (CEST time zone)

July 7, 2021, Wednesday

9:00 – 9:30 **Opening Ceremony**

Prof. Dr. Levente Kovács
Prof. Dr. Imre J. Rudas
Dr. Tamás Haidegger

9:30 – 10:50 **[W1] Session on Intelligent Transportation System**

Session Chair: *Andres Udal*

9:30 **Adversarial Autoencoder for Trajectory Generation and Maneuver Classification**

Oliver Rakos, Tamas Becsi, Szilard Aradi
Budapest University of Technology and Economics, Budapest, Hungary

9:50 **Generalized Location-based Linear Model for Overhead Wires Network Planning for Battery-assisted Trolleybuses**

Dobroslav Grygar, Michal Kohani
University of Zilina, Zilina, Slovakia

10:10 **Traffic Congestion Phenomena when Motorway Meets Urban Road Network**

Xuan Fang, Tamás Tettamanti
Budapest University of Technology and Economics, Budapest, Hungary

10:30 **Phase Plane-based Approaches for Event Detection and Plausibility Check of Vehicle Dynamics**

János Kontos*,**, Ágnes Vathy-Fogarassy*,
Balázs Kránicz**
* University of Pannonia, Veszprém, Hungary
** Continental Automotive Hungary Ltd., Veszprém, Hungary

10:50 – 11:00 Break

11:00 – 13:20 [W2] Session on Intelligent Mechatronics and Robotics Systems

Session Chairs: *Péter Galambos and Tamás Haidegger*

11:00 **Proposal of an Autonomous Vehicle Control Architecture**
Claudiu Radu Pozna*,**, Csaba Antonya*
*Transilvania University of Brasov, Brasov, Romania
**Széchenyi István University, Győr, Hungary

11:20 **A Trajectory Control Method for a Strongly Underactuated Spherical Underwater Surveillance Robot**
Igor Astrov, Andres Udal, and Heigo Molder
Tallinn University of Technology, Tallinn, Estonia

11:40 **Optimization-based Multi-actuator Control for Autonomous Vehicles**
Adorjan Kovacs, István Vajk
Budapest University of Technology and Economics, Budapest, Hungary

12:00 **Computational Analysis of Relaxed Unscented Transformation in terms of necessary floating point operations**
József Kuti, Péter Galambos
Óbuda University, Budapest, Hungary

12:20 **Intelligent Agent based Low Level Control of Complex Robotic Systems**
Sándor Tihamér Brassai, Attila Kovács
Sapientia Hungarian University of Transylvania, Romania

12:40 **Towards Standard Approaches for the Evaluation of Autonomous Surgical Subtask Execution**
Tamás D. Nagy, Tamás P. Haidegger
Óbuda University, Budapest, Hungary

13:00 **Generalized Approximate Model for "Fixed Point Iteration"-Based Control Methods**

Krisztián Kósi

Óbuda University, Budapest, Hungary

13:20 – 13:30 **Break**

13:30 – 14:50 **[W3] Session on Systems Engineering**

Session Chair: *Sándor Tihamér Brassai*

13:30 **Dynamic Resource Allocation Considering Ergonomics in Intralogistics**

Augusto Urru, Jan Philipp Wezel, Marco Bonini, Wolfgang Echelmeyer

Reutlingen University Reutlingen, Germany

13:50 **New Era of Intelligent Engineering Towards Autonomous Systems**

László Horváth

Óbuda University, Budapest, Hungary

14:10 **Game Feature Validation of a Real-Time Game Space with an eXtended Classifier System**

Damijan Novak, Iztok Fister Jr.

University of Maribor, Maribor, Slovenia

14:30 **Energy security in the context of sustainability at global and domestic level**

Ferenc Molnár

Óbuda University, Budapest, Hungary

14:50 – 15:00 **Break**

15:00 – 16:20 [W4] Session on Computational Intelligence in Engineering, and Web Engineering, and CAD/CAM/CAE Systems

Session Chair: *Balázs Benyó*

15:00 **Versatile Hardware Architecture of a Support Platform for Spatial Image Processing Accelerators using Xilinx SoCs**

Aous H. Kurdi, Janos L. Grantner, Ikhlas Abdel-Qader
Western Michigan University, Kalamazoo, MI, USA

15:20 **Fuzzy Decision-Making Methods in Transport Engineering**

Malak Shatnawi, Laszlo Pokoradi, Rajnai Zoltan
Óbuda University, Budapest, Hungary

15:40 **A Minimalistic Toolbox for Extracting Features from Sport Activity Files**

Iztok Fister Jr., Luka Lukač, Alen Rajšp, Iztok Fister, Luka Pečnik, Dušan Fister
University of Maribor, Maribor, Slovenia

16:00 **Personalisable Vertebral Body Model Development**

Sándor Bazsó*, Árpád Viola**, Balázs István Benyó*
*Budapest University of Technology and Economics, Budapest, Hungary
**Semmelweis University and Péterfy Hospital and Jenő Manninger National Institute of Traumatology Budapest, Hungary

July 8, 2021, Thursday

9:00 – 9:40 **Plenary Session**

Session Chair: *Tamás Haidegger*

Perspective Algorithms in Control of Turbojet Engines
Rudolf Andoga
Technical University of Košice, Košice, Slovakia

9:40 – 9:50 **Break**

9:50 – 11:10 **[T1] Session on Artificial Intelligence in Engineering**

Session Chair: *Tamás Orosz*

9:50 **An Ontology-based Approach for Preprocessing in Machine Learning**
Patricia Centeno Soto, Nour Ramzy
Infineon Technologies AG, Munich, Germany
Felix Ocker and Birgit Vogel-Heuser
Technical University of Munich, Munich, Germany

10:10 **Net Photosynthesis Prediction by Deep Learning for Commercial Greenhouse Production**
Ying Qu, Anders Clausen, Bo Nørregaard Jørgensen
University of Southern Denmark, Odense, Denmark

10:30 **Kernel Search for the Generalized Assignment Problem**
Ľudmila Jánošíková
University of Žilina, Slovak Republic

10:50 **Higher Dimensional Insulin Sensitivity Prediction in Intensive Care**
Bálint Szabó*, Geoffrey Chase**, Balázs Benyó*
*Budapest University of Technology and Economics, Budapest, Hungary
**University of Canterbury, Canterbury, New Zealand

11:10 – 11:40 Break

11:40 – 13:20 [T2] Session on Communications Software and Systems in Engineering, and Man-Machine Systems

Session Chair: *Iztok Fister*

11:40 Introduction of Reference-Frame Transformation Through Interactive Simulation

Istvan Halasz
Teleki Blanka High School, Szekesfehervar, Hungary
Tamas Orosz
Eötvös Loránd University, Budapest, Hungary
Jozsef Halasz
Obuda University, Szekesfehervar, Hungary
Arpad Elekes
KIWI Waldorf High School, Budapest, Hungary

12:00 Utilizing Cost-effective NB-IoT-based Sensors for Detecting Water Temperature and Flow

Petri Rantanen*, Jarkko Mäkivaara**, Mika Saari*, Pekka Sillberg*, Hannu Jaakkola*
*Tampere University, Pori, Finland
**AQVA.IO Oy, Pori, Finland

12:20 Connection of IT Systems Under Level One

Livia Roka-Madarasz
The Royal Institution of Chartered Surveyors, London, GB
The Budapest University of Technology and Economics, HU
The International Facility Management Association, Houston, US

12:40 Scrum-guided Student Projects in Data Warehouse Courses at Óbuda University

Enikő Nagy, Attila Rusznak, Attila Ritzl, Rita Fleiner
Óbuda University, Budapest, Hungary

13:00 Stability and Retraction Force Verification of a New Retractor Design for Minimally Invasive Surgery

Illés Nigicser, Matthew Oldfield
University of Surrey, Guildford, UK
Tamás Haidegger
Óbuda University, Budapest, Hungary

13:20 – 13:30 Break

13:30 – 15:30 [T3] Special Session on Emerging Excellence in Intelligent Engineering

The session was organized by the Doctoral School of Applied Informatics and Applied Mathematics, Óbuda University, Budapest, Hungary

Session Chair and Organizer: *László Horváth*

13:30 **Moving Obstacle Segmentation with an Optical Flow-based DNN: an Implementation Case Study**
Artúr I. Károly, Renáta Nagyné Elek, Tamás Haidegger, Péter Galambos
Óbuda University, Budapest, Hungary

13:50 **Load Frequency Control Analysis of PV System Using PID and ANFC Controller**
Rituraj Rituraj*, Annamária R. Várkonyi-Kóczy
Óbuda University, Budapest, Hungary

14:10 **Surgical Skill Assessment Automation Based on Sparse Optical Flow Data**
Gábor Lajkó*, Renáta Nagyné Elek** and Tamás Haidegger**
*Technische Universität Berlin, Germany and ELTE, Hungary
**Óbuda University, Budapest, Hungary

14:30 **Review of Using Open Source Software for SOC for Education Purposes – a Case Study**
Anikó Szarvák, Valéria Póser
Óbuda University, Budapest, Hungary

14:50 **Adaptive Neuro-fuzzy Inference System for Automated Skill Assessment in Robot-Assisted Minimally Invasive Surgery**
Kristóf Takács, Tamás Haidegger
Óbuda University, Budapest, Hungary

15:10 **Suboptimal Adaptive Receding Horizon Control Using Simplified Nonlinear Programming**

Hazem Issa, Hamza Khan and József K. Tar
Óbuda University, Budapest, Hungary

Thank you for your cooperation!

See you next year at INES 2022!

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