



BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS

*FACULTY OF TRANSPORTATION ENGINEERING
AND VEHICLE ENGINEERING*

16TH MINI CONFERENCE ON VEHICLE SYSTEM DYNAMICS, IDENTIFICATION AND ANOMALIES

5 - 7 NOVEMBER, 2018
BUDAPEST, HUNGARY

VSDIA 2018

FINAL PROGRAM

Conference WEB site:
www.vsdia.bme.hu

**2018 - The VSDIA Conference Series
is 30 Years Old**

16th MINI CONFERENCE ON VEHICLE SYSTEM DYNAMICS, IDENTIFICATION AND ANOMALIES

to be held in **Budapest, Hungary**, at the **Faculty of Transportation Engineering and Vehicle Engineering** of the **Budapest University of Technology and Economics (BME)** between 5 and 7 November, 2018.

President of the Conference:

Prof. István ZOBORY (Hungary)

International Scientific Committee:

Prof. Masato ABE (Japan)

Prof. Stefano BRUNI (Italy)

Prof. József BOKOR (Hungary)

Prof. Otmar KRETTEK (Germany)

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Organising Committee:

Prof. Ferenc KOLONITS Professor Emeritus

Prof. András SZABÓ Associate Professor

Prof. József CSIBA Head of Railway Certification

Prof. Gergely TULIPÁNT Associate Professor

Mr. Csaba KISS Master Trainer

Dr. Domokos ESZTERGÁR-KISS Senior Lect.

Mr. Miklós KRÉMER Dept.Eng.

Mr. András KOVÁCS Assistant Lect.

Mr. István NÉMETH Master Trainer

Mr. Lajos VÉGH PhD Student

Sponsors:

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BME ITS ZRt - Intelligent Transportation Systems

Knorr-Bremse R&D Institute Budapest

Knorr-Bremse Brake Systems Ltd.

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Hungarian Transport Association

Stadlertrains Hungary Ltd.

GRAMPET Wagon Factory Ltd.

16th MINI CONFERENCE ON VEHICLE SYSTEM DYNAMICS, IDENTIFICATION AND ANOMALIES

Conference Site:

Budapest University of Technology and Economics (BME)

Conference Centre, Building (A),
Budapest, Egry József str. 20-22.

Vehicle Engineering Building (J),
Budapest, Sztoczek str. 4-6.

To approach: Trams: 4, 6; Buses: 212

Central Building (K),
Budapest, Műgyetem rkp. 3-9.

To approach: Trams: 18, 19, 41, 47, 49; Buses: 7, 86

The **five sessions** of the Conference are:

- **Plenary Session**
- **Session for Dynamics, Identification and Anomalies of Railway Vehicles**
- **Session for Dynamics, Identification and Anomalies of Road Vehicles**
- **Session for Dynamics, Identification and Anomalies of Aircraft and Ships**
- **Session for Vehicle Control Theory and Interdisciplinary Sciences**

The **official language** of the conference is **English**. The **participation fee** is 150 € (**49000.- Ft**), which covers the costs of the *abstracts, preliminaries, conference reception, lunches and Proceedings*. The **Proceedings** will be published in English after the Conference and mailed to all participants.

The **participation fee should be paid in cash** at the registration desk of the Conference on arrival.

Lunches will be served in the University Cafeteria.

First Day

5 November, 2018

- 9 00 - 11 00 : Registration of participants
Conference Centre, Bldg. A, ground floor
- 11 00 : **PLENARY SESSION**
Conference Centre, Bldg. A, ground floor
Chairman: I. ZOBORY (Hungary)
- 11 00 - 11 05 : **ZOBORY, I.** (Hungary)
Presidential Opening Address
- 11 05 - 11 25 : **GÁTI, B. – VASS, G.** (Hungary + USA)
Investigation of Airfoils in Jetstream
- 11 30 - 11 50 : **PITTNER, CH. – EDELMANN, J. – PLÖCHL, M.** (Austria)
Reference models for Torque-vectoring in Electric Vehicles
- 12 00 : **LUNCH**
at the University Cafeteria
- 14 00 : **AFTERNOON PLENARY SESSION**
Conference Centre, Bldg. A, ground floor
Chairman: I. ZOBORY (Hungary)
- 14 05 - 14 25 : **MONTROUGE, A.** (France)
Identification of Tire Model Parameters from Vehicle Measurements Using Sensitivity Analysis
- 14 30 - 14 50 : **MÜLLER, G. – LUBER, B. – SORRIBES-PALMER, F. - PIETSCH, L. – SIX, K.** (Austria)
Influence of the Wheel Profile Condition on the Dynamic Behaviour of Wheel-Rail Interface Quantities
- 14 55 - 15 15 : **VU, V. T. – NGUYEN, T.H. – ZOLOTAS, A. – SENAME, O. – DUGARD, L.:** (Vietnam + France)
Towards Robust Linear Parameter Varying Control for Active Rail Vehicle Wheel-Sets
- 15 20 - 15 45 : **COFFEE BREAK**

- 15 45 - 16 05 : **HEGEDŰS, F. – BÉCSI, T.** (Hungary)
Evaluation of Trajectories for Automated Road Vehicles in
Sense of Dynamical Feasibility
- 16 10 - 16 30 : **BENEDA, K. – NAGY, A.** (Hungary)
Introduction, Identification and Control of a New Fuel Meter-
ing System on a Micro Turbojet Engine
- 16 35 - 16 55 : **VANDANJON, P-O. – EL-ALMI TAHA, V.E.** (France)
Slope Optimisation (Sloop): Tailor-made Optimisation for
Road Longitudinal Profile Ecodesign Considering the Dynam-
ics of Vehicles

18 00 :

CONFERENCE PARTY

**Danube Hall, Central Building K
Budapest, Műgyetem rakpart 3-9
1st floor, No 2.**



Second Day

6 November, 2018

SESSION FOR DYNAMICS, IDENTIFICATION AND ANOMALIES
OF RAILWAY VEHICLES
Building J. floor 2, No 202

Chairman: F. KOLONITS (Hungary)

- 9 00 - 9 20 : **ZOLLER, V.** (Hungary)
Analysis of the Track/Vehicle Interaction with Regard to the
Coupling with the Subgrade Dynamics
- 9 25 - 9 45 : **CHUDZIKIEWICZ, A. – STELMACH, A.** (Poland)
Evaluation of the Process of Placing in Service of a Rail Ve-
hicle with Regard to Safety of Transport Operation
- 9 50 - 10 10 : **JAKUSHEV, A. – HOMONETS, I.** (Russia)
Impact of Residual Stresses on the Railcar Wheel Strength

10 15 - 10 45 : **COFFEE BREAK**

Chairman: A. CHUDZIKIEWICZ (Poland)

- 10 45 - 11 05 : **ALBON, A.** (France)
Optimized Wheel Profile
- 11 10 - 11 30 : **SZABÓ, A – ZOBORY, I.** (Hungary)
Vertical Dynamical Loading Conditions of Driven Wheel-Sets
- 11 35 - 11 55 : **ZOBORY, I. – NAGY, D.** (Hungary)
Creep Control in Brake Operation to Avoid Wheel Sliding and
Flattening

12 15 - 12 25 : **CONFERENCE PHOTO**
In Front of Bldg. J

12 25 - 14 00 : **LUNCH**
at the University Cafeteria

AFTERNOON SESSION, Room J202

Chairman: J. CSIBA (Hungary)

- 14 00 - 14 20 : **NÉMETH, I.** (Hungary)
How to Avoid Dynamical Instability in Disc-Brake Systems by Using Additional Linear Damping
- 14 25 - 14 45 : **KRÉMER, M.** (Hungary)
Compromises and Optimisation Possibilities within the PINTA Project
- 14 50 - 15 10 : **LIN, S. – SUDA, Y.** (Japan)
Vehicle Condition Monitor System Considering Vehicle and Track Maintenance

15 15 - 15 45 : **COFFEE BREAK**

Chairman: Z. ZÁBORI (Hungary)

- 15 45 - 16 05 : **ALFI, S. – BRUNI, S. – FU, B.** (Italy + China)
Condition Monitoring and Fault Detection of Suspension Components in Freight Wagons Using Acceleration Measurements
- 16 10 - 16 30 : **CSIBA, J.** (Hungary)
Numerical Analysis of the Failures, Reliabilities Availabilities with Different Operation and Maintenance Circumstances
- 16 35 – 16 55 : **VÉGH, L.** (Hungary)
Dynamics of Derailment



**SESSION FOR DYNAMICS, IDENTIFICATION AND ANOMALIES
OF ROAD VEHICLES**

Building J. floor 2, No 207

Chairman: ZS. SZALAY (Hungary)

- 9⁰⁰ - 9²⁰ : **COSTA, L. – PERRIN, CH. – DUBOIS-LAUNIS, M. - SERRE, T. – M’SIRDI, N.K.** (France)
Modelling of the Powered Two-Wheelers Dynamic Behaviour for Emergency Situations Analysis
- 9²⁵ - 9⁴⁵ : **KOKREHEL, CS. – NÉMETH, H.** (Hungary)
Wheelbrake Design for Battery Electric Vehicles
- 9⁵⁰ - 9¹⁰ : **SZÚCS, G. – BÁRI, G.** (Hungary)
Tire Data Analysis Method for Finding Grip-Optimal Slip and Camber Values
- 10¹⁵ - 10⁴⁵ : **COFFEE BREAK**

Chairman: H. NÉMETH (Hungary)

- 10⁴⁵ - 11⁰⁵ : **WIDNER, A. – BÁRI, G.** (Hungary)
Investigating the Effects of Roll Centre Height, During Transient Vehicle Manoeuvres
- 11¹⁰ - 11³⁰ : **ERŐSDI, Z. – BÁRI, G.** (Hungary)
Yaw Rate Control for Enhancing Vehicle Steering Behaviour
- 11³⁵ - 11⁵⁵ : **BÁRDOS, Á. – NÉMETH, H.** (Hungary)
Diesel Engine Cylinder-Charge Composition Control With Hp-Egr and Exhaust Throttling
- 12¹⁵ - 12²⁵ : **CONFERENCE PHOTO**
In Front of Bldg. J
- 12²⁵ - 14⁰⁰ : **LUNCH**
at the University Cafeteria

AFTERNOON SESSION, Room J207

Chairman: G. MELEGH (Hungary)

- 14⁰⁰ - 14²⁰ : **NAKANO, K. – SEKI, M. – KAIZUKA, T. – ZHENG, R. – SAKURA, T. – MAKI, T.** (Japan)
Design of Haptic Steering Guidance Controller Considering Look Ahead Distance

14 25 - 14 45 : **LENGYEL, H. – SZALAY, ZS.** (Hungary)
Potential Weak Points of Environment Sensors in Autonomous Vehicles

14 50 - 15 10 : **SIMON, T.S. – MELEGH, G. – SZALAY, ZS.** (Hungary)
Automated Vehicles' Accidents – Uber Self-Driving Vehicle Accident

15 15 - 15 45 : **COFFEE BREAK**

Chairman: K. NAKANO (Japan)

15 45 - 16 05 : **NYERGES, Á. – FANCSI, M.** (Hungary)
Parking Place Detection for Autonomous Vehicles

16 10 - 16 30 : **TARI, B. – ARADI, SZ. – GÁSPÁR, P. – BÉCSI, T.** (Hungary)
Machine Learning Based Race Track Control

16 35 – 15 55 : **KONCZ, A.** (Hungary)
Failure Mode And Effect Analysis Types In the Automotive Industry and Their Usage



**SESSION FOR DYNAMICS, IDENTIFICATION AND ANOMALIES
OF AIRCRAFT AND SHIPS**

Building J. floor 2, No 208

Chairman: H. G. REIMERDES (Germany)

- 9 00 - 9 20 : **SZONDA, G. - VERESS, Á.** (Hungary)
Numerical Modelling and Improvements of Flow Field Around
the Landing Gear And Wheel Cowling for Skycruiser Sc-200
Autogyro
- 9 25 - 9 45 : **BÍRÓ, O. – SZABÓ, G.** (Hungary)
Integrating Large Remotely Piloted Vehicles into The Con-
trolled Airspace
- 9 50 - 10 10 : **MOLNÁR, I.T. – URBAN, A.X.C. - VERESS. Á.** (Hungary)
Investigation of Hybrid Propulsion Systems Applied on Small-
Sized Aircraft

10 15 - 10 45 : **COFFEE BREAK**

Chairman: B. GÁTI (Hungary)

- 10 45 - 11 05 : **BENEDA, K. – DERBEL, K.** (Hungary + Tunisia)
Identification of Single Spool Micro Turbojet Engine with
Fixed Exhaust Nozzle at Multiple Operating Points for Linear
Parameter Varying Control
- 11 10 - 11 30 : **HARGITAI, CS. – SIMONGÁTI, GY. – ZALACKÓ, R.** (Hungary)
Operational Profile of Inland Public Transport

12 15- 12 25 : **CONFERENCE PHOTO**
In Front of Bldg. J

12 25 - 14 00 : **LUNCH**
at the University Cafeteria



**SESSION FOR VEHICLE CONTROL THEORY AND
INTERDISCIPLINARY SCIENCES**

Building J. floor 2, No 210

Chairman: P. GÁSPÁR (Hungary)

- 9⁰⁰ - 9²⁰ : **FÉNYES, D. – NÉMETH, B. – GÁSPÁR, P.** (Hungary)
Possibilities of Vehicle State Estimation Using Big Data Approaches
- 9²⁵ - 9⁴⁵ : **SZŐCS, D. – NÉMETH, B. – BEDE, ZS.** (Hungary)
Challenges and Problems in the Design of Smart Intersections
- 9⁵⁰ - 9¹⁰ : **DALVÁRI, M. – FÉNYES, D. – MIHÁLY, A. – NÉMETH, B. – GÁSPÁR, P.** (Hungary)
Camera-Based Lateral Driver Modelling for Vehicle Control Design Purposes

10¹⁵ - 10⁴⁵ : **COFFEE BREAK**

Chairman: O. SENAME (France)

- 10⁴⁵ - 11⁰⁵ : **SZALAY, J. – KŐVÁRY, B. – ARADI, SZ. – GÁSPÁR, P. – BÉCSI, T.** (Hungary)
Highway Behaviour Training through Learning Based State Choice Model
- 11¹⁰ - 11³⁰ : **DO, M. H. – KOENIG, D. – THEILLIOL, D.** (France+Vietnam)
Robust H_∞ Proportional-Integral Observer Design for Fault Estimation
- 11³⁵ - 11⁵⁵ : **VU, V.T. – SENAME, O. – DUGARD, L. – PHAM, T.P. – DINH, V.P.** (France +Vietnam)
 H_∞ /LPV Active Braking Control System to Prevent Rollover of Heavy Vehicles

12¹⁵ - 12²⁵ : **CONFERENCE PHOTO**
In Front of Bldg. J

12²⁵ - 14⁰⁰ : **LUNCH**
at the University Cafeteria

AFTERNOON SESSION (A-CONTROL), Room J210

Chairman: Z. SZABÓ (Hungary)

- 14 00 - 14 20 : **RATHAI, K.M.M. – SENAME, O. – ALAMIR, M.** (France)
A Comparative Study of Different NMPC Schemes for Control of Semi-Active Suspension System
- 14 25 - 14 45 : **VARGA, B.** (Hungary)
Energy Aware Cruise Control for Urban Public Transport Buses
- 14 50 - 15 10 : **HEGEDŰS, T. – NÉMETH, B. – BEDE, K.** (Hungary)
Control and Decision Method for Overtaking Problem in Autonomous Vehicles

15 15 - 15 45 : **COFFEE BREAK**

Chairman: T. LUSPAY (Hungary)

- 15 45 - 16 05 : **PAPP, J. – BÁRI, G.** (Hungary)
Hardware in the Loop Test System for Teaching Model Based Design and Decision Method for Automotive Control
- 16 10 - 16 30 : **PHAM, T.P. – SENAME, O. – DUGARD, L. – VU, V.T.** (France +Vietnam)
Real-Time Estimation of the Damping Force of Vehicle Electrorheological Suspension
- 16 35 – 15 55 : **DOMINA, Á. – TIHANYI, V.** (Hungary)
Comparison of Controller Systems and Motion Modelling Methods for Autonomous Vehicles Trajectory Following Practice

AFTERNOON SESSION (B-INTERDISCIPLINARY), Room J208

Chairman: A. SZABÓ (Hungary)

- 14 00 - 14 20 : **KOLONITS, F.** (Hungary)
Possible Cause of an Internal Level Crash, '95 Kobe Eq
- 14 25 - 14 45 : **TULIPANT, G. – SZABÓ, A. – ZOBORY, I.** (Hungary)
Laboratory Investigation into the Noise Generated by Sliding Friction for Cast Iron and Steel Friction Pairs
- 14 50 - 15 10 : **KISS, CS.** (Hungary)

Some Remarks on the Designing of a Crankshaft

15 15 - 15 45 : **COFFEE BREAK**

Chairman: I. ZOBORY (Hungary)

15 45 - 16 05: **HIDAS, A.** (Hungary)

Thermal Simulation to Ensure Heat Management of Vehicle Ecus with Plastic Enclosure

16 10 - 16 30 : **POKORÁDI, L. – LÁZÁR-FÜLEP, T.** (Hungary)

Dependability of Vehicle Systems with Complex Interconnections

16 35 – 16 55 : **POKORÁDI, L. – SOMOSI, V.** (Hungary)

Graph-Theoretical Investigation of Vehicle and Transportation Systems



Third Day

7 November, 2018

SESSION FOR DYNAMICS, IDENTIFICATION AND ANOMALIES OF RAILWAY VEHICLES

Conference Centre, Bldg. A, ground floor

Chairman: L. OROSZVÁRY (Hungary)

9 00 - 9 20 : **ZÁBORI, Z. – ZOBORY, I.** (Hungary)
Track Qualification Method by Using System Dynamics
Based Parameter Identification Procedure

9 25 - 9 45 : **MALATINSZKY, S.** (Hungary)
Conformity Assessment of a Modernised Locomotive Bogie
and Body Connection

9 50 - 10 10 : **DI GIALLEONARDO, E. – BIONDA, S. – BRAGHIN, F. –
SOMASCHINI, C.** (Italy)
Design of Experiment Approaches for the Calibration of In-
strumented Wheel-Set

10 15 - 10 45 **COFFEE BREAK**

Chairman: O. KRETTEK (Germany)

10 45 - 11 05 : **SOMASCHINI, C. – DI GIALLEONARDO, E. – COLLINA, A.
– BOCCIOLONE, M.** (Italy)
Algorithm Development to Classify the Deterioration of Insu-
lated Rail Joints by Means of Onboard Measurements

11 10 - 11 30 : **CARNEVALE, M. – COLLINA, A.** (Italy)
A Rolling Stock-Based System for Pantograph and Catenary
Condition Monitoring

11 35 - 11 55 : **SZŐKE, D. – ZOBORY, I.** (Hungary)
Investigation into the Structure of the Railway Track/Vehicle Connection

12 00 - 14 00 : **LUNCH**
at the University Cafeteria



14 00 : **CLOSING PLENARY SESSION**

Chairman: I. ZOBORY (Hungary)

Closing Address, *FAREWELL DRINK*

CAMPUS

of the

Budapest University of Technology and Economics (BME)

