



Transilvania
University
of Brasov



Transilvania
University
of Brasov
FACULTY OF
MECHANICAL ENGINEERING



SIFAR

SAE
INTERNATIONAL



CRIEST



Academia de Stiinte
Tehnice din Romania
Technical Sciences
Academy of Romania

The International Congress of Automotive and Transport Engineering EAEC – CONAT 2024

CONGRESS PROGRAMME



November 06 – 08, 2024

Brasov, ROMANIA

Welcome to CONAT 2024, Braşov!



CONAT History

The CONAT International Congress is a traditional scientific event initiated by TRANSILVANIA University since 1965. At the previous 12 editions of the Congress, valuable scientific papers were presented, by teaching staff of the technical universities, as well as by specialists working in the design and research departments, manufacturing companies or in the operation division of automotive transport companies. A short review of the previous edition is listed below:

- XIIth edition: 2016, October 26 – 29, , 147 papers, more than 200 participants from 17 countries;
- XIth edition: 2010, October 20 - 22, 216 papers, 273 participants from 19 countries;
- Xth edition: 2004, October 20 - 22, 208 papers, 375 participants from 15 countries;
- IXth edition: 1999, November, 189 papers, 155 participants from 11 countries;
- VIIIth edition: 1996, November 13 - 15, 290 papers, 418 participants, 64 institutions from 7 countries;
- VIIth edition: 1993, Mars 18 - 20, 197 papers, 358 participants, 42 institutions from 8 countries;
- VIth edition: 1988, November 25 - 26, 222 papers, 344 participants, 50 institutions;
- Vth edition: 1985, November 21 - 22, 261 papers, 410 participants, 61 institutions;
- IVth edition: 1982, November 19 - 20, 182 papers, 244 participants, 23 institutions;
- IIIrd edition: 1980, November 28 - 29, 121 papers, 184 participants, 23 institutions;
- IInd edition: 1976, November 26 - 27, 101 papers, 131 participants, 20 institutions;
- Ist edition: 1965, December 16 - 18, 56 papers, 103 participants, 17 manufacturing and research institutes and universities;



Professor **Anghel CHIRU**

Congress Chairman
Co-president of the
Scientific Committee



Professor **Cornel STAN**

Co-president of the
Scientific Committee

Electromobility, depollution, sustainable development, alternative and synthetic fuels, internal combustion engines powered by hydrogen, fuel cells, hybrid and electric vehicles, electric energy storage batteries, eco-design, digitization, industry 4.0, circular economy, autonomous and intelligent vehicles, the energy simulation of vehicles with various propulsion sources, the multifactorial analysis of the life cycle and the evolution of the vehicle fleet according to the perspective of the decarbonization of road traffic, traffic and road safety, new materials and technologies, historical landmarks and the evolution of the automobile, are interesting, captivating and attractive topics that will be analyzed with professionalism and scientific competence in the papers that will be presented by specialists in automotive and transport engineering, from 18 countries from Europe, Americas, Asia and Africa, in the plenary and technical sessions of the International Congress of Automotive and Transport Engineering EAEC – CONAT 2024.

Organized by Transilvania University of Braşov, together with SIAR, EAEC, SAE International, and supported by CRIFST – Romanian Academy and ASTR – Romanian Academy of Technical Sciences, the EAEC – CONAT 2024

Congress benefits from technical and logistical support provided by companies and institutes representative research for the automotive industry, such as Schaeffler, Siemens, Star Assembly, Autoliv, Renault Group, AVL, FEV, Seebert Technologie, INAS, ALSECA Engineering, AMTECH, Spectromas, RAR, AKA, and professional organisation like ACAROM and UNTRR.

In order to ensure a transfer of information and technical and scientific expertise to the future generation of specialists, the congress provides a platform for automotive students and "Formula Student" teams from Romania to present their academic projects, scientific works and technical creations.

The EAEC-CONAT 2024 Congress also celebrates the 75th anniversary of the founding of the Faculty of Mechanical Engineering of Transilvania University of Braşov and the first academic study program in the field of Automotive Engineering in Romania.

The congress preparation program required mobilization and determination from the team of the Department of Automobiles and Transports of Transilvania University, and our partners and collaborators. We thank everyone for their involvement and dedication.

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Congress Chairman
Co-president of the
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FISITA Member Societies



AEA - Associação Brasileira de Engenharia Automotiva
Brazil



AITA - Asociación de Ingenieros y Técnicos del Automotor
Argentina



AMETS-AG - Association of Mechanical Engineers and Technicians Automotive Group, Slovenia
Slovenia



ANFIA ATA - Italian Association of the Automotive Industry
Italy



CAS - Česká Automobilová Společnost
Czech Republic



CSAE - China SAE
China



GTE - Gepipari Tudományok Egyesület
Hungary



HDMV CroSEV - Hrvatsko Društvo za Motore i Vozila
Croatia



IAE Sri Lanka - The Institute of Automotive Engineers - Sri Lanka
Sri Lanka



ISTVS - International Society for Terrain-Vehicle Systems
United States



JSAE - Society of Automotive Engineers of Japan
Japan



JUMV - Jugoslovensko Društvo za Motore i Vozila
Serbia



KIVI
Netherlands



KSAE - The Korean Society of Automotive Engineers
Korea, Republic of



LAIA - Latvia Association of Automobile Engineers
Latvia



LAIS - Lietuvos Automobiliu Inzinieru Sajunga
Lithuania



ÖVK - Österreichischer Verein für Kraftfahrzeugtechnik
Austria



SAE International
United States



SAE-A - Society of Automotive Engineers - Australasia
Australia

SAE Switzerland - Society of Automotive Engineers Switzerland
Switzerland



SAEINDIA
India



SAITS - Spolok Automobilových Inzinierov a Technikov Slovenska
Slovakia



SATL - Suomen Autoteknillinen Liitto r.y.
Finland



SIA - Société des Ingénieurs de L'Automobile
France



SIAR - Societatea Inginerilor de Automobile din Romania
Romania



SIMP - Stowarzyszenie Inzynierow I Technikow Mechanikow Polskich
Poland



STA - Sociedad de Técnicos de Automoción
Spain



SVEA - Swedish Vehicular Engineering Association
Sweden



TSAE - Society of Automotive Engineers of Thailand
Thailand



UBIA - Union Belge des Ingenieurs de L'Automobile
Belgium



VDI - Verein Deutscher Ingenieure e.V.
Germany

Presidential address from EAEC

First, I would like to thank SIAR for the organisation of the EAEC-CONAT 2024 Congress.

This will continue the series of European Automotive Congresses. SIAR has hosted this EAEC Congress in the framework of the annual SIAR Congresses and Congresses two before.

There is a need for more specific co-operation among major European Societies, which are members of FISITA. The European automotive industry is on a level playing field with its competitors in America and the Asia-Pacific region. That's why a

European congress like this is so important to show the flag.

These Congresses are a highlight of SIAR's programmes. As these events are organised by a different university in each case, the participants have a chance to get to see new interesting historical cities.

The annual SIAR events are general automotive congresses as well as the FISITA and EAEC congresses. That means that various topics of the automotive technology are covered.

I wish the Congress organisers all success, many interesting presentations and many useful contacts.



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Dr. Guenter Hohl

EAEC Interim President

Brigadier retr. Prof. Dr. Guenter Hohl

EAEC Interim President



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Transilvania University of Braşov, Romania

Professor **Stelian ŢĂRULESCU**
Transilvania University of Braşov, Romania

Congress Programme

Date/Time	Scheduled activities	Location
Tuesday, November 5		
17:00 - 19:00	Registration Opening of the Exhibition	The Conference Center of Transilvania University
19:00 - 19:40	Musical Moment - Choral Harmonies / Choral Polychromies (the 'Astra' Choir)	
19:40 - 22:00	Welcome Reception	
Wednesday, November 6		
07:30 - 08:30	Registration Important! - the registration will be closed during the opening/plenary/technical sessions!	The Conference Center of Transilvania University For students: Restaurant "Floarea Soarelui"
08:30 - 10:10	Opening Ceremony	
10:10 - 10:30	Musical Recital - piano	
10:30 - 11:10	Plenary Session	
11:10 - 11:30	Registration / Coffee Break	
11:30 - 13:30	Plenary Session	
13:30 - 14:30	Lunch Break	
14:30 - 16:00	Plenary Session	
16:00 - 16:30	Registration / Coffee Break	
16:30 - 18:00	Technical Sessions	
	SIAR General Meeting	Studio 181 (Rectorat)
19:00 - 19:30	Organ Concert	Black Church
19:40 - 22:00	Gala Dinner	ARO Palace

Thursday, November 7

08:30 - 11:00	Registration	Technical Sessions	The Conference Center of Transilvania University Rooms UI2, UI3, UI6, UI7
		"Formula Student" Meeting	Studio 181 (Rectorat)
09:00 - 11:00		"Professor C. Ghiulai" Contests: Vehicle Dynamics and Automotive CAD	ICDT (Automotive Research Center)
		Student Congress	
11:00 - 11:30	Coffee Break		
		Technical Sessions	The Conference Center of Transilvania University Rooms UI2, UI3, UI6, UI7
11:30 - 13:30		"Formula Student" Meeting	Studio 181 (Rectorat)
		"Professor C. Ghiulai" Contests: Vehicle Dynamics and Automotive CAD	ICDT (Automotive Research Center)
		Student Congress	
13:30 - 14:30	Lunch Break		- The Conference Center of Transilvania University - for students: at the ICDT
		Technical Sessions	The Conference Center of Transilvania University Rooms UI2, UI3, UI6, UI7
14:30 - 16:30		"Professor C. Ghiulai" Contests: Vehicle Dynamics and Automotive CAD	ICDT (Automotive Research Center)
		Student Congress	
16:30 - 17:00	Coffee Break		
17:00 - 19:00		Technical Sessions	The Conference Center of Transilvania University
19:00 - 19:40		Musical Recital - piano / panflute	
19:40 - 22:00		Dinner	

Friday, November 8

09:00 - 10:30	Administrative Operations		The Conference Center of Transilvania University
09:00 - 12:00		Technical Visits (registrations at the congress secretariat, in 5-6.11)	Schaeffler Autoliv ICDT
09:30 - 10:30		Technical Panel <ul style="list-style-type: none"> ▣ Modern Measuring and Testing Systems Implemented by SPECTROMAS in Automotive Industry / Speaker: Mihai Seciureanu ▣ Simulation in Automotive, by INAS SA / Speaker: Ioana Tîrcomnicu-Unga 	The Conference Center of Transilvania University
10:30 - 13:00		Workshop "Connecting Academia with Industry through Research" Projects Presentations	
13:00 - 13:30		Musical Recital - piano	
13:30 - 14:30		Closing Ceremony	
14:30 -		Farewell buffet	



Keynote Speakers



The Diesel Engine: A Turning Point in the History of Technology

Professor Alexandre HERLEA

Comité des Travaux Historiques et Scientifiques – Institut de l'Ecole Nationale des Chartes, France (emeritus member)



Sustainable Propulsion Systems for On- and Offroad Applications

Professor Helmut EICHLSEDER

Technical University Graz, Austria
Institute of Thermodynamics and Sustainable Propulsion Systems



Decarbonizing of Mobility – Challenges of Energy Transition and Solutions for Automotive Drives

Professor Bernhard GERINGER

Vienna University of Technology, Austria
Austrian Society for Automotive Engineers



Engineering the Future – Different Powertrain Technologies for different Applications

Dr. Christoph MENNE

FEV Europe GmbH, Germany

***Energy for the future - the
right fuel for every mobile
application***

Wolfgang HOFFMANN

CEO - HPE-Konstanz
Adjunct Professor at HTWG Konstanz,
Germany



***Compacted Snow Testing
Instrumentation and
Parameters Collection for
Tire-Snow Studies***

Professor Corina SANDU

Virginia Tech University, USA
Director of the Terramechanics, Multibody,
and Vehicle Systems (TMVS) Laboratory



***Low Carbon Integrated Modular
Structure for ICE and E-motor Recycled
Carbon Composite Enclosures: Scale-
up to Commercialization for Automotive
Market***

Professor Mohini SAIN

University of Toronto, Canada
Director, Centre for Biocomposites and Biomaterials
Processing



Software defined vehicles

Ing. Ioan Ovidiu TRIPON

Expert - Software Architecture
Schaeffler Romania



Technical Sessions Wednesday, November 6

Wednesday, 6.11.2024, 16:30 – Aula Magna (*online presentations included*)

Session VDS 1 – Vehicle Dynamics, Vehicle Systems

Chairman: C. Antonya

Numerical evaluation of the influence of terrain properties in clay-tire interactions (ID 845)

V.S. Swamy, D. Mason, A. Yerro, C. Sandu, K. Sebeck, and D. Gorsich

Speaker: V.S. Swamy

Development of a Suspension Energy Harvester Utilizing a Mechanical Resonator (ID 917)

L. Gross, D. Edward, L. Hupp, R. Ahmed, and M. Mehrtash

Speakers: L. Gross, D. Edward

Wednesday, 6.11.2024, 16:30 – Room UI2

Session POW 1 – Advanced Powertrain Systems

Chairman: C. Pană

Research on Performances of a Single-Cylinder Engine Fueled with Mixtures of Diesel and Kerosene (ID 790)

C.I. Leahu, A. Budală and S. Țârulescu

Speaker: A. Budală

Determination of Energetic Performances of an Engine Fueled with Mixtures of Diesel and Kerosene using Roller Dynamometer (ID 856)

A. Budală and C.I. Leahu

Speaker: A. Budală

Powertrains for Air-powered Vehicle (ID 990)

Y. Dimitrov, G. Kadikyanov and Y. Dimitrova

Speaker: Y. Dimitrov

Effects of Retrofitting Diesel Engine Injector Nozzles, focusing on Engine Performances (ID 1004)

C.C. Suci, V. Stoica, S.V. Igrat, and I. Ionel

Speaker: C.C. Suci

Wednesday, 6.11.2024, 16:30 – Room UI3

Session MAT 1 – New Materials, Manufacturing Technologies

Chairman: P. Gumpel

Cleaning engine air intake filters – consequences on filtering (ID 1039)

M. Toma, A. Asimopolos, Șt. Voloacă, and G. Dincă

Speaker: M. Toma

Bibliometric approach for mapping the research on harnessing Digital Twins in mechanical fatigue of materials and structures (ID 1046)

M.N. Baba, C. Husar, F. Dogaru, O. Jitărășu, and A.I. Matea

Speaker: A.I. Matea

Enhancing Plastic Components Used in the Mobility Industry Through Foaming Processes (ID 1040)

C. Draghici, A. Mihailescu, T. Calin, C. Diaconescu, D. Leuciuc

Speaker: D. Leuciuc

Wednesday, 6.11.2024, 16:30 – Room UI6

Session HIST 1 – History of Automotive Technics and Technologies

Chairman: Al. Herlea

The Automobile, from a Glorious Past to an Uncertain Future (ID 942)

M. Oprean, C. Andreescu, and A. Chiru

Speaker: C. Andreescu

The challenges of paradigm changes resulting from the evolution of the automotive industry (ID 910)

O. Frunze

Speaker: O. Frunze

Evolution of Automotive Electrical Equipment Industry. Electroprecizia Săcele-Braşov Case Study (ID 864)

E. Helerea, L.A. Mustaţă, L.E. Aciu, and L. Leluţiu

Speaker: L. Leluţiu

Wednesday, 6.11.2024, 16:30 – Room UI7

Session TRS 1 – Advanced Transport Systems

Chairman: S. Țârulescu

Innovative transfer: harnessing automotive technologies for maritime progress (ID 983)

A. Baicoianu, C. Husar, V. Solomon, C. Irimia, and L.P. Larsen

Speaker: A. Baicoianu

Structure and Efficiency of Road Freight Vehicles Utilization as a Factor of Transport Companies Competitiveness (ID 937)

N. Şestenco-Diacek

Speaker: N. Şestenco-Diacek

The advantages of VISUM/VISSIM software, in the development of Sustainable Urban Mobility Plans (ID 894)

M. Deac, N. Filip, T. Deac, and F. Gaspar

Speaker: F. Gaspar

The emergence of the Vehicular Metaverse: a scoping review (ID 819)

Gh. D. Voinea, R.G. Boboc, M.D. Danu, I.D. Buzdugan, E.V. Butilă, C.C. Postelnicu, and F. Girbacia

Speaker: Gh. D. Voinea



Technical Sessions Thursday, November 7

Thursday, 7.11.2024, 09:00 – Room UI2

Session POW 2 – Advanced Powertrain Systems

Chairman: *B.O. Varga*

Analysis of the combustion at the use of low doses of hydrogen in the automotive spark ignition engine (ID 805)

R. Georgescu, C. Pană, N. Negurescu, Al. Cernat, C. Nuțu and A. Panait

Speaker: *Al. Cernat*

0D/1D modeling of lean-burn conditions in a hydrogen SI engine for closer correlation of in-cylinder chemical species with optical data (ID 806)

S.S. Merola, A. Irimescu and G. Cecere

Speaker: *G. Cecere*

Addressing Range Anxiety in Electric Vehicles with Physics-Based Drivetrain Models and an Appropriate Charging Strategy (ID 834)

R. Vanderbeeken, P. Duysinx, and Y. Toussaint

Speaker: *R. Vanderbeeken*

Energy Storage System Design and Thermal Behavior Investigation While Being Used by a Light-Electric-Van Virtual Prototype (ID 1002)

V. Croitorescu and M. Mirica

Speaker: *M. Mirica*

Modelling and simulation of an urban electric bus for energy consumption in real operating conditions (ID 955)

Șt. Al. Necula, M.V. Bățăuș and Gh. Frațilă

Speaker: *Șt. Al. Necula*

The investigation of mathematical optimization techniques used for the design and development of powertrain systems (ID 815)

M. Gaidur, E. Rakosi, T.M. Ulian and Gh. Manolache

Speaker: *T.M. Ulian*

Thursday, 7.11.2024, 09:00 – Room UI3

Session AEM 1 – Advanced Engineering Methods

Chairman: *W. Gründer*

Plant Modelling of Engine and Aftertreatment Systems for X-in-the-Loop Simulations with Detailed Chemistry (ID 814)

M. Pasternak, R. Siddareddy, L. León de Syniawa, V. Guenther, M. Picerno, J. Andert, T. Franken, F. Mauss, and W. Adamczyk

Speaker: *M. Pasternak*

Aspects of the Design of an Additively Manufactured Cylinder Head for a Stationary Hydrogen ICE (ID 878)

T. Dost, R. Schambach and J. Getzlaff

Speaker: *T. Dost*

Integrating MBD Simulation and Experimentation for Enhanced Rollover Prevention Strategies in Agricultural Tractors (ID 816)

M. Karaca, G. Carabin, S. Temur, M.M. Topaç, and F. Mazzetto

Speaker: *M. Karaca*

Contributions regarding the Dynamic Optimization Process of a Connecting Rod from an Internal Combustion Engine (ID 779)

A. Calangiu, N. Dumitru, C. Copilusi, S. Dumitru, and I. Geonea

Speaker: *C. Copilusi*

Effect of Stiffening Rib Location on Failure Tendency of a Heavy-Duty Rear Axle Housing (ID 988)

M.M. Topaç, K. Polat, O. Seren, M.M. Buldu, G. Güzey

Speaker: K. Polat

Experimental Analysis of Frictional Torque from Radial Ball Bearings (ID 1036)

I. Geonea, N. Dumitru and I. Dumitru

Speaker: I. Geonea

Thursday, 7.11.2024, 09:00 – Room UI6

Session ENV 1 – Automobile and Environment

Chairman: C. Cofaru

Impacts of different propulsion systems on life cycle CO₂-equivalent emissions of automated cars (ID 851)

T.T. Nguyen and M. Hirz

Speaker: T.T. Nguyen

Measures to reduce the environmental impact of transport proposed in SUMP for small cities (ID 756)

S. Țârulescu, R. Țârulescu, A. Șoica, D. Covaciu, C.I. Leahu, M. Duguleană, and R. Szigeti

Speaker: S. Țârulescu

CO₂ and Pollutant Emission Reduction using Variable Valve Train in Heavy Duty Diesel Engines (ID 853)

P. Traversa, M. Elicker, N. Morelli, and S. Harges

Speaker: M. Elicker

GHG Impact Assessment for Hydrogen Vehicles (ID 893)

N. Filip, M. Deac, F. Gaspar, and T. Deac

Speaker: F. Gaspar

Chemical pollution evaluation method using the carbon footprint for various road traffic scenarios in Craiova (ID 999)

I. Dumitru, L. Matei, L. Racila, N. Gencărașu, and Al. Oprica

Speaker: Al. Oprica

The Impact of Real Driving on Electric Vehicle Energy Consumption (ID 961)

C. Constantin, M. Bățăuș, C. Rențea, and Gh. Frățilă

Speaker: C. Constantin

Thursday, 7.11.2024, 09:00 – Room UI7

Session HIST 2 – History of Automotive Technics and Technologies

Chairman: C. Andreescu

Dimitrie Leonida – The great design engineer, project coordinator, founder and upholder of the development of Romanian technical education (ID 838)

C.B. Ghiță and C.F. Cristea

Speaker: C.B. Ghiță

Two Personalities who attest to the Bivalent Connection between the Development of the Electrical Automotive Equipment Sector and Electrotechnical Higher Education in Brașov (ID 848)

E. Helerea

Speaker: E. Helerea

Electrical vehicle history and new challenges (ID 879)

M.D. Călin, L. Barote, and E. Helerea

Speaker: M.D. Călin

Flying taxis as a solution for the future (ID 1026)

M. Arghirescu and L. Spiridon

Speaker: M. Arghirescu

Biography of Prof. univ.eng. Radu-Emil Mărdărescu, the Creator of the Automobile and Engines School at the Institute of Mechanics in Braşov (ID 1030)

V. Mărdărescu and M.D. Călin

Speaker: V. Mărdărescu

The tram as an alternative and ecological means of transport in Sibiu in the period 1904-1948 (ID 1045)

D. Curelea and D. Curelea

Speaker: D. Curelea

Thursday, 7.11.2024, 11:30 – Room UI2

Session MAT 2 – New Materials, Manufacturing Technologies

Chairman: D. Luca-Motoc

Automated Waste Sorting using Deep Learning and Synthetic Data (ID 899)

I.Al. OGREZEANU, C. SUCIU, and L.M. ITU

Speaker: I.Al. OGREZEANU

Current methods for determining the influence of hydrogen in metallic materials and their limits (ID 843)

A. Hörtnagl, D. Hofer, and R. Hannemann

Speaker: A. Hörtnagl

Study on the effect of the pre-state of electropolished surfaces of austenitic stainless steels on the generated topography (ID 844)

A. Hörtnagl, P. Gümpel, C. Mauch, and T. Bogatzky

Speaker: A. Hörtnagl

The role of shape memory alloys in modern and future automobiles (ID 887)

J. Strittmatter

Speaker: J. Strittmatter

The influence of interlayer ironing on dimensional accuracy of ASA MEX manufactured parts (ID 852)

D.A. CERLINCĂ, I. TAMAŞAG, and I. BEŞLIU-BĂNCESCU

Speaker: I. TAMAŞAG

Thursday, 7.11.2024, 11:30 – Room UI3

Session AEM 2 – Advanced Engineering Methods

Chairman: I. Preda

AI-Based Knowledge Processing and Dissemination in Engineering Design (ID 782)

W.T. GRÜNDER

Speaker: W.T. GRÜNDER

An Investigation of Soil-Tire Interaction using Advanced Finite Element Approaches (ID 1019)

D. JASOLIYA, A. UNTAROIU, C.D. UNTAROIU

Speaker: C.D. UNTAROIU

Realtime Lidar-based Detection and Tracking of Dynamic Objects for an Autonomous Vehicle on Public Roads (ID 818)

M. SAUTTER, M. KOCSIS, J. BUYER, and R.D. ZÖLLNER

Speaker: M. SAUTTER

Comparative study of passive, semi-active and active suspension of a truck cabin using a Simulink model (ID 907)

C. STAN, A. IONIŢĂ, D. IOZSA, and R. OPREA

Speaker: C. STAN

Calculation program in Microsoft Excel for sequential reliability tests during the useful life of the products (ID 758)

T.A. UDMA, O. POPA, A.AL. BOROIU, A.M. ŢIŢU, and AL. BOROIU

Speaker: AL. BOROIU

Control Techniques for Correct Driver Posture (ID 775)

A. Stefanita and S. Butnariu

Speaker: A. Stefanita

Thursday, 7.11.2024, 11:30 – Room UI6

Session ENV 2 – Automobile and Environment

Chairman: N. Ispas

Approaches to collecting and processing an ambient air quality database (ID 922)

S. Babanov and V. Ronkova

Speaker: S. Babanov

Alternative energy storage systems for enhancing cars efficiency and sustainability (ID 812)

O. Frunze

Speaker: O. Frunze

Roof Up or Down: Exploring Particulate Matter and Noise Pollution Dynamics in Convertible Vehicles (ID 1006)

D.M. Mustață, I. Ionel, D. Bisorca, and R.M. Balogh

Speaker: D.M. Mustață

Frictionless braking systems for automotive applications: State of the art and modern trends (ID 905)

G. Achitei, L. Achitei, A.I. Dontu, and A.C. Sachelarie

Speaker: G. Achitei

Recovery of Metals from Used Batteries of Electric Vehicles (ID 764)

I.Al. Rus, C. Birtok Baneasa, and E.V. Nicolae

Speaker: I.Al. Rus

Advancements in automotive waste management - A case study on dismantling and recycling processes in Romania (ID 793)

L. Barbeș, L.C. Manea, A.T. Manea, and S.L. Ionașcu

Speaker: L.C. Manea

Thursday, 7.11.2024, 11:30 – Room UI7

Session TRS 2 – Advanced Transport Systems

Chairman: D. Iozsa

Modeling a road system for traffic assessment in relation to express highway construction (ID 997)

L. Răcilă, I. Dumitru, and L. Matei

Speaker: L. Răcilă

Evaluation of different types of junction management for a different geometric design (ID 996)

I. Dumitru, L. Matei, and L. Răcilă

Speaker: L. Matei

Traffic flow investigation of an adaptive signal control system in several junctions (ID 998)

L. Matei, I. Dumitru, and L. Răcilă

Speaker: L. Matei

Study on the implementation of an efficient rural public transport system (ID 763)

R. Țârulescu, S. Țârulescu, A. Chiru, D. Covaciu, S. Butnariu, R. Szigeti, and M. Niculescu

Speaker: S. Țârulescu

Enhancing Traffic Flow and Safety: Analysis and Optimization of a Roundabout Intersection through Virtual Modeling (ID 769)

Al. I. Radu, B.I. Nituleasa, and D. Luca Motoc

Speaker: Al. I. Radu

An Innovative Transportation Vehicle Design: Hyper Speed Transportation System (ID 891)

A.A. Pirli and S. Ersoy

Speaker: A.A. Pirli

Thursday, 7.11.2024, 14:30 – Room UI2

Session VDS 2 – Vehicle Dynamics, Vehicle Systems

Chairman: N. Cordoş

Suspension Parameter Identification based on Synthetic Data (ID 1005)

A. de Hoyos Fernández de Córdova, J.L. Olazagoitia, C. Gijón-Rivera, D. Gomez-Lendinez and R.B. del Cerro

Speaker: A. de Hoyos Fernández de Córdova

Aspects of Planetary Transmissions Predesign (ID 1012)

I. Preda

Speaker: I. Preda

Testing Rig for Laboratory Research of Tyre Pressure Transducers (ID 824)

G. Anghelache, A.R. Moisescu, and D.L. Bureţea

Speaker: A.R. Moisescu

Particularities regarding the design and construction of the anti-tipping bar placed on the side of trailers intended for the transport of wood material (ID 959)

V.I. Ţenţ, F.B. Scurt, T. Vesselenyi, H. Beleş, B.A. Ţolea, and Şt. Halasz

Speaker: V.I. Ţenţ

Analysis of braking force and absolute deceleration using data obtained from measurements on the brake stand (ID 859)

M.F. Popa, B.M. Jurchis, and N. Burnete

Speaker: M.F. Popa

Performance Evaluation of GNSS Systems in Low-Signal Environments and Implications for Vehicle Safety (ID 840)

C.I. Anuţoiu, A. Chiru, J. Timar

Speaker: C.I. Anuţoiu

Thursday, 7.11.2024, 14:30 – Room UI3

Session MAT 3 – New Materials, Manufacturing Technologies

Chairman: D. Ostoia

The Effect of the Drawing Angle and the Tool Diameter on Forming Force Prediction in Single Point Incremental Forming (ID 938)

M. Habbachi and A. Baksa

Speaker: M. Habbachi

Reverse Engineering Based Approach towards Vehicle Wheel Hub Design and Manufacturing (ID 771)

G. Goliţă and D. Luca Motoc

Speaker: D. Luca Motoc

Mechanical Evaluation of 3D-Printed Lightweight Structure for Automotive parts: A Simulation Based Analysis (ID 1024)

Y. Abouyazid, Y. Cherradi, M. Benyoucef, and O. Cherkaoui

Speaker: Y. Abouyazid

Enhancing Mechanical Performance of Composites with Argan Shell Powder: An experimental Investigation for Automotive Applications (ID 1025)

Y. Cherradi, H. El Qarnia, A. Bourmaud, M. Rahmoune, and M. Benyoucef

Speaker: Y. Cherradi

Performance Improvements for Vehicle Wheel liners (ID 1043)

C. Draghici, A. Mihailescu, C. Diaconescu, Şt. Tabacu, D. Leuciuc

Speaker: Şt. Tabacu

Thursday, 7.11.2024, 14:30 – Room UI6

Session ARA 1 – Accident Research and Analysis

Chairman: A. Sachelarie

A Numerical Investigation of the Influence of Pre-crash Maneuvers on Passenger Safety Performance (ID 1020)

A. Dahiya, C.D. Untaroiu

Speaker: C.D. Untaroiu

Impact Attenuation Assessment of Several Lightweight Materials Subjected to a Motorcycle Helmet Free-Fall Drop Test (ID 882)

D.D. Trușcă, M.N. Baba, and M.D. Stanciu

Speaker: M.N. Baba

A Crash-Energy Distribution Technique for Seats to Improve Neck Protection in Rear-End Impacts (ID 932)

S. Himmetoglu

Speaker: S. Himmetoglu

Transdisciplinary possibilities for approaching road traffic accidents: A review (ID 846)

Al. Terec, A. Todoruț, I. Barabás, N. Cordoș and I. Duma

Speaker: Al. Terec

Comparative Analysis of Vehicle Trajectory and Velocity Estimations (ID 927)

M. Găman and D.S. Dima

Speaker: M. Găman

Technical solutions for improving the lateral protection of N1 category vehicles (ID 830)

D.T. Ioniță, A. Chiru, N. Ispas, D.D. Trușcă, and C. Nedelescu

Speaker: D.T. Ioniță

Thursday, 7.11.2024, 14:30 – Room UI7

Session TRS 3 – Advanced Transport Systems

Chairman: N. Filip

Deep Learning and Proper Orthogonal Decomposition for Transport Phenomena Simulations (ID 1047)

P. Cizmaș, M. Schulz, J. Standridge

Speaker: P. Cizmaș

Connected and Autonomous Vehicles in Urban Mobility: Technologies, Challenges and Opportunities (ID 903)

I.T. Oargă, B.O. Varga, D. Moldovanu, G. Prunean, and H. Cărbăușan

Speaker: I.T. Oargă

Evaluation and analysis of public transport services for county seat municipalities in Romania (ID 755)

S. Țârulescu, R. Țârulescu, A. Șoica, A. Chiru, C.I. Leahu, and R. Szigeti

Speaker: S. Țârulescu

Adaptive Decision-Making Framework for Autonomous Vehicles: A Reinforcement Learning Approach to Urban Traffic Safety (ID 817)

I.D. Buzdugan, I.A. Roșu, F.B. Scurt, and C. Antonya

Speaker: I.A. Roșu

Collision Avoidance System simulation for occluded pedestrian (ID 825)

I.A. Roșu, I.D. Buzdugan, and C. Antonya

Speaker: I.A. Roșu

Identification and Evaluation of Traffic Management Scenarios Using Microscopic Simulation in Mekelle (ID 966)

H.G. Tetemke, T.D. Yehdego

Speaker: H.G. Tetemke

Thursday, 7.11.2024, 17:00 – Room UI2

Session POW 3 – Advanced Powertrain Systems

Chairman: E. Rakosi

The design and development of an Integrated Propulsion System – Phase 4: shared cooling and lubrication strategy (ID 1032)

V. Croitorescu and G. Enache

Speaker: V. Croitorescu

The design and development of an Integrated Propulsion System – Phase 5: shared cooling and lubrication system mathematical model and virtual prototype (ID 1033)

V. Croitorescu and G. Enache

Speaker: G. Enache

CVPT - Continuously Variable Planetary Transmission (ID 802)

V. Sivu

Speaker: V. Sivu

Experimental research concerning the decreasing of the state of charge from the traction battery for an electric vehicle used in urban driving conditions (ID 971)

V. Nişulescu, F. Ivan, M. Toma, C. Renţea, Gh. Bancă

Speaker: V. Nişulescu

Research into the simulation of the autonomy of the electric vehicles on the WLTC cycle using the AMESim platform (ID 992)

C. Mînzatu, V. Nişulescu, M. Toma, C. Renţea, Gh. Bancă

Speaker: C. Mînzatu

Contributions to the modelling of gasoline injection in the spark ignition engines (ID 759)

M. Blaga

Speaker: M. Blaga

Thursday, 7.11.2024, 17:00 – Room UI3

Session AEM 3 – Advanced Engineering Methods

Chairman: S. Butnariu

Autonomous Driving Object Detection Platform (ID 982)

L. Carabulea, C. Pozna, C. Antonya, F. Arhip, and C. Husar

Speaker: L. Carabulea

Test-based virtual methods to explore NVH issues of Hybrid and Electrical Vehicles (ID 985)

S. Săcăreanu, C. Irimia, D. Predica, and A. Băicoianu

Speaker: S. Săcăreanu

Emergent Trends in Deep Learning for Autonomous Electric Vehicles: A Literature Review (ID 766)

M. Duguleană, F. Gîrbacia, R.G. Boboc, and E.V. Butilă

Speaker: M. Duguleană

Detection of Phone Distraction while Driving Using Open Visual-Language Models (ID 826)

F. Gîrbacia, Gh. D. Voinea, M.D. Danu, I.D. Buzdugan, and M. Duguleană

Speaker: F. Gîrbacia

Comparative Analysis of 3D Scanning Methods for Object Reconstruction: Applications and Insights (ID 836)

S. Zisu

Speaker: S. Zisu

Thursday, 7.11.2024, 17:00 – Room UI6

Session ENV 3 – Automobile and Environment

Chairman: L.C. Manea

The Study of Vehicle Emissions using a Dynamic Cycle Performed on the Base of Real Urban Traffic (ID 780)

C. Nițoiu, C. Cofaru, M.V. Popescu, and C. Klement

Speaker: C. Nițoiu

Comparative Analysis of the Emissions Obtained on the Dynamometer Stand During Use the WLTP Cycle and the Real Urban Driving Cycle on Two Types of Vehicles (ID 781)

C. Nițoiu, C. Cofaru, and M.V. Popescu

Speaker: C. Nițoiu

The impact of road transport on the level of CO₂ in urban areas (ID 1029)

A. Șoica, S. Țârulescu, R. Elie, R.R.V. Juliana, R. Herizo, and M. Popa

Speaker: S. Țârulescu

The influence of the exhaust gas recirculation (EGR) system on the quality of fuel combustion in diesel engines (ID 788)

S. Rațiu, A. Gidali, and D.M. Armioni

Speaker: S. Rațiu

Experimental determinations in order to establish the influence of the diesel quality and engine load on the smoke emissions of diesel cars (ID 832)

S.M. Burciu

Speaker: S.M. Burciu

Thursday, 7.11.2024, 17:00 – Room UI7

Session ARA 2 – Accident Research and Analysis

Chairman: H. Beleş

Software applications, equipment and procedures used for the acquisition and processing of experimental data in case of road accidents (ID 753)

C. Nedelescu, A. Chiru, R.I. Negrilă, P.M. Vrabie, D.D. Trușcă

Speaker: C. Nedelescu

The impact of bullbar devices on dynamics and consequences of vehicle-pedestrian road accidents (ID 773)

I. Ciobanu, A. Chiru, and Al. I. Radu

Speaker: I. Ciobanu

Optimization of road infrastructure safety management by analysing statistical data of serious road accidents in urban areas. Case study: streets of Bucharest (ID 934)

C.I. Dimitriu and Gh. Frățilă

Speaker: C.I. Dimitriu

Contributions to strengthening the national legislative framework for road infrastructure safety management in Romania. Case study on the evolution of national regulations (ID 935)

C.I. Dimitriu and Gh. Frățilă

Speaker: C.I. Dimitriu

Mathematical modeling of vehicle impact against a rigid barrier (ID 752)

C. Nedelescu, A. Chiru, R.I. Negrila, P.M. Vrabie, and D.D. Trușcă

Speaker: C. Nedelescu

Student Papers Thursday, November 7

Thursday, 7.11.2024, 09:00 – ICDT

Session STUD 1

Chairman: A. Şoica

Aerodynamics in Karting (ID 923)

G.O. Onaca, D. Maxim, F.B. Scurt, C.Al. Toth

Speaker: G.O. Onaca

Fixed air quality monitoring station in road traffic (ID 946)

S. Ionascu, Al. Şopro, C. Hâncu and R.G. Perianu

Speaker: R.G. Perianu

Global Positioning and Data Synchronisation System (ID 948)

A. Ţurcanu, C.C. Chihaiia and R. Drăgan

Speaker: A. Ţurcanu

Outriggers for vehicle testing; measuring and analyzing dynamic parameters using a GPS-based system (ID 949)

E.D. Dumitru

Speaker: E.D. Dumitru

Study of gas exchange and acoustical supercharging of the Wankel engine (ID 975)

M. Dimache

Speaker: M. Dimache

Study of gas exchange of a supercharged, two stroke, opposed piston engine (ID 829)

C. Ene

Speaker: C. Ene

Thursday, 7.11.2024, 11:30 – ICDT

Session STUD 2

Chairman: D.S. Dima

Implementation and evaluation of the bearing monitoring system in the EV field using vibrations sensors in the context of Maintenance Engineering (ID 947)

D. Barbu, R. Ferchiu and V. Silivestru

Speaker: R. Ferchiu

Construction and mechanical design of a four rotor (ID 974)

M. Bălăşescu

Speaker: M. Bălăşescu

Analysis of Brake Energy Recovery Potential in Fly-wheels (ID 976)

R.C. Mînză

Speaker: R.C. Mînză

Lithium iron phosphate battery pack for hybrid drive applications (ID 1044)

A.C. Grigore, Al.J. Vaduva

Speaker: C. Badea

Thursday, 7.11.2024, 14:30 – ICDT

Session STUD 3

Chairman: L. Jelenschi

Designing a lightweight and ergonomic Formula Student pedal box assembly using finite element analysis (ID 800)

R.C. Iridon, A.T. Borborean, M.Pop-Calimanu

Speaker: R.C. Iridon

Designing and Manufacturing Composite Driving Shafts for a Formula Student Car (ID 847)

A.C. Borza, S.V. Galatanu, A.T. Borborean

Speaker: A.C. Borza

Efficiency of the design of a Formula Student chassis based on an architecture in CATIA (ID 931)

D. Ursache, Al.G. Pantiru, R.A. Chiscop, Șt. Grigorean

Speakers: Al.G. Pantiru, R.A. Chiscop

Evaluation of the tire influences on the dynamics of a Formula Student type single-seater (ID 1048)

B.T. Gal and A. Todoruț

Speaker: B.T. Gal

Development of an Electric Powertrain for a Formula Student Vehicle (ID 1049)

I.G. Moldovan and M.Al. Bilici

Speaker: I.G. Moldovan

Technical Visits Friday, November 8, 09:00

SCHAEFFLER ROMANIA



Schaeffler Romania is one of the top production units of the Schaeffler Group, a renowned supplier to the automotive industry.

AUTOLIV ROMANIA



Autoliv Romania was set up in 1997 in Brașov and it is increasing ever since with new business lines in Brașov, Lugoj, Timișoara, Sfântu Gheorghe and Reșița.

ICDT – R&D Institute



Transilvania University Research Institute, L6 and L9 Buildings – research Hub for Accident Reconstruction, Hybrid Propulsion, Autonomous Driving, a.s.o.



Workshop Friday, November 8, 10:30

„Connecting Academia with Industry through Research”

Chairman: Călin HUSAR

Project presentations:

- Powerful Advanced N-level Digital Architecture for models of electrified vehicles and their components (PANDA <https://project-panda.eu/>) - speaker Călin Husar (Siemens)
 - Driver-In-the-Loop SIMulation for safety-critical testing scenarios of Electric Vehicles (DILSIMEV <http://www.dilsimev.ro/>) – speaker Csaba Antonya (UniTBv)
 - hOListic & Green Airports (OLGA <https://www.olga-project.eu/>) – speaker Bogdan Varga (UTCN)
 - In Silico testing and validation of Cardiovascular Implantable devices (SIMCor - <https://www.simcor-h2020.eu/>) – speaker Lucian Itu (UniTBv)
- 11:15: [CINEA](#) (European Climate, Infrastructure and Environment Executive Agency) - “EU-funded research on clean road transport and electric vehicle systems” – **speaker Dr Marcel Rommerts**, Head of Unit – Horizon Europe Transport (online)

PANDA

<https://project-panda.eu/>

In PANDA a method has been developed to organise and interconnect models for electrical vehicle (EV) components. Traditionally, internal combustion engines are developed (to a certain extent) independently from the vehicles. In electrified vehicles all systems are more integrated, making it fundamentally more complex to design an EV. Using the PANDA approach all electrical components in an EV can be combined in a single model. Designers can quickly investigate new architectures and components, without having to build a physical prototype first. The method is based on the Energetic Macroscopic Representation (EMR) formalism.

DILSIMEV

<http://www.dilsimev.ro/>

The project is proposing to develop an advanced simulation tool for enhancing the driving experience and for increasing the safety of the vehicles in the new age of semi and fully autonomous cars. The outcome of the project will be a new human-machine interaction paradigm introduced through a real-time decision-making system in which the actions and personal needs of the drivers (acquired and automated competencies) are introduced into the learning process of semi and fully autonomous driving

OLGA

<https://www.olga-project.eu/>

OLGA is a Horizon 2020 project that aims to reduce the environmental impact of the aviation sector. It develops innovative and sustainable solutions to reduce CO2 emissions, optimise energy efficiency, preserve biodiversity, and improve air quality and waste management while involving the entire aviation value chain.

SIMCor

<https://www.simcor-h2020.eu/>

The complexity and speed of technological innovation, with increasingly short product cycles, creates huge demand for standardized best practices to apply in-silico validation methods in a statistically robust, repeatable, and efficient way. SIMCor will address this challenge by providing manufacturers of cardiovascular implantable devices with an open, reusable, cloud-based platform for in-silico

The City

The Braşov city, capital of region Braşov, with a population of little less than 300.000 inhabitant's, first mentioned in documents back in 1235, as a medieval fortress, build over a former Neolithic settlement, is situated in central region of Romania, at the base of Tampa Hill and surrounded by the Carpathians.

During its history, the city was also known as Brasco, Brasso, Stephanopolis, Kronstadt, and **Braşov**.

The old fortifications and the remnants of the famous fortress-city lure tourists from everywhere: The Weaver's Bastion, as the oldest bastion in the country, The Black and White Towers, The Catherine's Gate, The Black Church as the most important Gothic monument in Eastern Europe with an astonishing organ, and many more. The city bears the marks of being the Romanian centre of culture and civilization for hundreds of years: The First Romanian School, the first written document in Romanian housed by the Weaver Bastion, the oldest building in town: The Church of St.Batholomeu, founded in 1241, the oldest of the medieval authorities, The Old City Hall (see picture below) and so on.

Situated at the crossroad between Transylvania and Wallachia, Braşov offers its resort centre, Poiana Braşov, for businessmen and tourists equally.



The University

Transilvania University of Braşov Automotive and Transportation Department

The beginning and development of higher education in the Braşov city origin from the old cultural traditions and intense cultural climate.

The following are several turn points in the University's history:

1940 – Academical education has been founded in Braşov, as part of Commercial and Industrial Study Academy;

1949 - Mechanical Institute has been founded, by the initiative of the Romanian Engineer Association;

1965 – The first Didactic staff Scientific CONAT Session has been attained;

1971 –University of Braşov was formed by the union of Polytechnic and Pedagogic Institutes from Braşov;

1974 – Participation of the first Didactic staff of the Vehicles and Tractors Department at the FISITA International Congress (ed.XV - May '74, Paris);

1974-1977 -The Staff of Vehicles and Tractors Department designed and developed the first small litre vehicle prototype;

1979-1981 - The Staff of Vehicles and Tractors Department designed and homologated the first Diesel engines for ROMAN, TRACTORUL and MASTER;

1990 - University of Braşov renamed to Transilvania University of Braşov;

1990 - Foundation of SIAR Society and its affiliation to FISITA;

1990 – Apparition of RIA Automotive Magazine;

1992–2010 - Participation to FISITA and EAEC International Congresses located in London, Prague, Paris, Seoul, Beijing, Barcelona, Cernobio, Yokohama, Bratislava, Budapest and München;

1994 – Designing, developing and homologating a Street sweeper in cooperation with Fachhochschule Konstanz;

1995–2010 - Scientific Research Programs in collaboration with Technical Universities of Konstanz, Aachen, Zwickau and Karlsruhe;

1996 – SIAR – SAE Partnership established;

1997 and 2004 - Braşov FISITA Board reunion;

1997–2001 - SAE Diplomas in recognition of professional activity;

1997–2009 - Participation to Detroit SAE Congresses;

2000 - The first International SAE-SIAR Symposium accomplished in cooperation with SAE International in Upside Moeciu;

2006 – Partnership with Wayne State University, Detroit;

2006-2008 - Development of Research Platform Advanced Systems for Autovehicles and Transport – SAVAT;

2005-2007 – Participation to Mini Baja Student Competition;

2007 – Continuous - scientific activity on accident reconstruction, run by the members of Automotive and Engines Department, resulted in the first crash experiments at Transilvania University, Mechanical Engineering Faculty.

2009 - Continuous – Participation at the Formula SAE Competitions for students;

2010 – Inauguration of the modern Engines Research Centre;

2016 – CONAT Congress;

2021-2022 – Series of online conferences and lectures presided by esteemed national and international collaborators, such as Professor Giovanni Cipolla, Herr Lars Lowenstein, Professor Corina Sandu.

In present Transilvania University maintains partnership with more than 160 educational centers and universities from E.U., U.S. and Asia such as: Fachhochschule Konstanz, RWTH – Aachen, Karlsruhe University - Germany, Compiegne, Belfort-Montbeliard - France, Gent - Belgium, Wayne State University

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