

# Session Program

## Monday 1<sup>st</sup> July

### Large Hall

#### IFTToMM 50th anniversary Ceremony

9:00-9:25 Opening of IFTToMM World Congress

Welcome for The 15<sup>th</sup> IFTToMM Word Congres- *prof. dr hab. inż. Tadeusz*

*Uhl*

Congratulations by Polish Ministry

Congratulations by President of Kraków City –*Jacek Majchrowski*

Congratulations by HM Rector AGH UST Krakow – *prof. dr hab. inż.*

*Tadeusz Słomka*

9:25-9:30 Welcome for anniversary celebrations by IFTToMM President,  
*prof. Marco Ceccarelli*

9:30-9:35 100 years of AGH UST- video

9:35-9:40 Cracow- promotional video

9:40-9:45 Bugler Performance

9:45-9:50 History of IFTToMM - video

9:50-10:20 Keynote of current IFTToMM President Prof Marco Ceccarelli

#### **IFTToMM: yesterday, today, and tomorrow**

10:20-10:40 Speech of past IFTToMM President, *prof. Bernard Roth*

#### **The Forming of International and Personal Connections Through IFTToMM in Spite of a Turbulent World**

10:40-11:05 Speech of past IFTToMM President, *prof Jorge Angeles*

#### **The Existential Question of IFTToMM in the 21st Century**

11:05-11:30 Speech of past IFTToMM President, *prof. Ken Waldron*

#### **Intersections between my career and IFTToMM**

11:30-11:55 Speech of past IFTToMM President, *prof. Yoshi Nakamura*

#### **Let me think about the gap between IFTToMM globalism and the economic globalism**

11:55-12:30 *Keynote Speakers: Herman Van der Auweraer*

#### **Digital Twin: from concept to value creation across the product lifecycle.**

12:30-12.40 Reveal of the anniversary plaque in congress hall

12.40-13.00 Group Photo

13:00-13:30 Toast in the congress hall

13:30-14:30 Lunch

## **Large Hall A**

14:30-16:30 **Session 1 Robotics**

*Giuseppe Carbone, Gentiane Venture*

14:30-14:50 **Motion Planning For a Humanoid Robot with Task Dependend Constraints**

*Zielinska Teresa, Luo Zimin, Maksymilian Szumowski, Weimin Ge*

14:50-15:10 **Adaptive Backstepping Motion Control of a New Sitting-type Lower Limb Rehabilitation Robot**

*Jayant Kumar Mohanta, Santhakumar Mohan, Yukio Takeda, Burkhard Corves*

15:10-15:30 **Feedback equivalence and motion planning of a space manipulator**

*Krzysztof Tchoń, Joanna Ratajczak*

15:30-15:50 **Resolution of Functional Redundancy for 3T2R Robot Tasks using Two Sets of Reciprocal Euler Angles**

*Moritz Schappeler, Svenja Tappe, Tobias Ortmaier*

15:50-16:10 **Kinetostatic Modelling and Gravity Compensation of the TriMule Robot**

*Yiwei Ma, Jiabo Zhang, Chenglin Dong, Haitao Liu*

16:10-16:30 **5DOF Mechanism for Vertebral Surgery Kinematic Analysis and Velocity Calculation**

*Victor Glazunov, G.S. Filippov, Alexey Lastochkin, Marco Cecceralli, S.A. Skvortsov, G. V. Rashoyan, A. K. Aleshin, K. A. Shaluhin*

16:30-17:00 Coffee & Poster Session

17:00-19:00 **Session 2 Robotics**

*Ashitava Ghosal, Dar-Zen Chen*

17:00-17:20 **Kinematic Analysis and Dimensional Synthesis of a Novel 3-DOF Parallel Mechanism**

*Jintao Li, Chenglin Dong, Shunzhou Huang, Huihui Zhao, Haitao Liu*

17:20-17:40 **Variable Stiffness Mechanism for Robotic Rehabilitation**

*Carl Nelson, Laurence Nouaille, Gérard Poisson*

17:40-18:00 **Comparison of 3-DOF Partially Decoupled Spherical Parallel Manipulators with Respect to Lateral Stabilities**

*Guanglei Wu, Huiping Shen*

18:00-18:20 **Error Modeling for the 3-UPU Parallel Manipulator in Terms of Joint Clearance and Link Deformation**

*Qiangqiang Zhao, Junkang Guo, Dingtang Zhao, Dewen Yu, Jun Hong*

18:20-18:40 **Dynamics of a Humanoid Robot with Parallel Architectures**

- Matteo Russo, Marco Ceccarelli*  
 18:40-19:00 **Effective configuration of a double triad planar parallel manipulator for precise positioning of heavy details during their assembling process**  
*Krzysztof Lipinski*
- 19:00-20:30 **MEETING: TC for Robotics and Mechatronics**  
*Yukio Takeda*

## **Large Hall B**

- 14:30-16:30 **Session 1 Biomechanical engineering**  
*Carlo De Bededictis, Elisa Digo*
- 14:30-14:50 **Multibody Biomechanical Modelling of Human Body Response to Vibrations in an Automobile**  
*Raj Desai, Anirban Guha, P. Seshu*
- 14:50-15:00 **Kinematic analysis of a novel planar six-bar bionic leg**  
*Ke Xu, Haitao Liu, Xingqiao Zhu, Yongbin Song*
- 15:00-15:20 **Parametric Design and Experimental Verification of Cicada-wing-inspired Controllable Wing Mechanism for Underwater Glider**  
*Sun Tongshuai, Yang Mingyuan, Wang Yanhui, Wang Shuxin, Huang cheng, Yang Shaoqiong, Chen Yan*
- 15:30-15:50 **A new inspection robot for pipelines with bends and junctions**  
*Swaminath Venkateswaran, Damien Chablat*
- 15:50-16:10 **Interactive device supporting ankle joint rehabilitation**  
*Michał Olinski, Antoni Gronowicz, Marco Ceccarelli*
- 16:10-16:30 **Experimental characterization of an osteosynthesis implant**  
*Octavio Ramirez, Christopher René Torres San Miguel, Marco Ceccarelli, Guillermo Manuel Urriolagoitia*
- 16:30-17:00 Coffee & Poster Session
- 17:00-19:00 **Session 2 Biomechanical engineering**  
*Walter Franco, Carlo De Benedictis*
- 17:00-17:20 **Study on stumble risk assessment from the motion data of the elderly**  
*Emiko Uchiyama, Toshihiro Mino, Tomoki Tanaka, Yosuke Ikegami, Wataru Takano, Yoshihiko Nakamura, Katsuya Iijima*
- 17:20-17:40 **A personalized flexible exoskeleton for finger rehabilitation: a conceptual design**  
*Daniele Cafolla*

- 17:40-18:00 **Numerical Investigation of an Axis-based Approach to Rigid Registration**  
*Michele Conconi, Nicola Sancisi, Vincenzo Parenti-Castelli*
- 18:00 **A methodology for the development of a Hinged Ankle-Foot Orthosis compatible with natural joint kinematics**  
*Carlo Ferraresi, Carlo De Benedictis, Daniela Maffiodo, Walter Franco, Andrea Peluso, Alberto Leardini*
- 18:20-18:40 **Design of an innovative fatigue test bench for dental implants**  
*Mikel Armentia, Mikel Abasolo, Ibai Coria, Iker Heras, Javier Vallejo, Josu Aguirrebeitia*
- 19:00-20:30 **MEETING: TC for Biomechanical Engineering**  
*Walter Franco*

## **Medium Hall A**

- 14:30-16:30 **Session 1 Computational Kinematics**  
*Georg Nawratil, Marco Carricato*
- 14:30-14:50 **Largest Area Ellipse Inscribing an Arbitrary Convex Quadrangle**  
*M. John Hayes, Zachary A. Copeland, Paul J. Zsombor-Murray, Anton Gfrerrer*
- 14:50-15:00 **Certied Kinematics Solution of 2-DOF Planar Parallel Continuum Mechanisms**  
*Oscar Altruza, Jean Pierre Merlet*
- 15:00-15:30 **Jerk and Jounce Relevance for the Kinematic Performance of Long-Dwell Mechanisms**  
*Giorgio Figliolini, Chiara Lanni*
- 15:30-15:50 **Design Parameter Space of Planar Four-bar Linkages**  
*John Hayes, Mirja Rotzoll, Manfred L. Husty*
- 15:50-16:10 **On Circle Intersections by Means of Distance Geometry**  
*Bertold Bongardt*
- 16:10-16:30 **On the Synthesis of Periodic Linkages with a Specific Constant Poisson's Ratio**  
*Freek Broeren, Just Herder, Volkert van der Wijk*
- 16:30-17:00 Coffee & Poster Session
- 17:00-19:00 **Session 2 Computational Kinematics**  
*M. John Hayes, Bertold Bongart*
- 17:00-17:20 **Singularity Distance for Parallel Manipulators of Stewart Gough Type**  
*Georg Nawratil*
- 17:20-17:40 **Parallel Robots with Homokinetic Joints: The Zero-Torsion Case**  
*Yuanqing Wu, J.M. Selig, Marco Carricato*

- 17:40-18:00 **Assembly Modes of General Planar 3-RPR Parallel Mechanisms when Using the Linear Actuators' Orientations**  
*Stefan Schulz, Arthur Seibel, Josef Schlattmann*
- 18:00-18:20 **Input and output singularities for parallel manipulators**  
*Seyedvahid Amirinezhad, Peter Donelan*
- 18:20-18:40 **Mechanical Presses Driven by a Geared Five-Bar with Sliding Output to Produce a Prolonged Dwell**  
*David Myszka, Andrew Murray, Allen Armstrong, Hessein Ali*
- 18:40-19:00 **An Improved Principal Coordinate Frame for use with Spatial Rigid Body Displacement Metrics**  
*Pierre Laroche, Venkatesh Venkataramanujam*
- 19:00-20:30 **MEETING: TC for Rotordynamics**  
*Paolo Pennacchi*

## **Medium Hall B**

- 14:30-16:30 **Session 1 History**  
*Alessandro Gasparetto, Agamenon Oliveira*
- 14:30-14:50 **Professor Jan Oderfeld – one of the Founding Fathers of the IFToMM**  
*Cezary Rzymkowski*
- 14:50-15:10 **Named Contributions to MMS: Bridging History and Terminology**  
*Petru A. Simionescu*
- 15:10-15:20 **Reconstruction of an Ancient Blossoming Flower Automaton with a Circular-arc Cam**  
*Yu-Hsun Chen, Marco Ceccarelli, Hong-Sen Yan*
- 15:30-15:50 **History of the Bernoulli Principle**  
*Agamenon Oliveira*
- 15:50-16:10 **A Note on Adrienne Mayor's Gods and Robots**  
*Teun Koetsier*
- 16:10-16:30 **Functional Analysis of an Animal-Drawn Reaper-Binder**  
*Walter Franco, Carlo Ferraresi, Paolo Giordano, Giuseppe Quaglia*
- 16:30-17:00 Coffee & Poster Session
- 17:00-19:00 **Session 2 History**  
*Teun Koetsier, Józef Wojnarowski*
- 17:00-17:20 **On Conferences of the Machine and Mechanism Science of the Polish Committee for the Theory of Machines and Mechanisms**

Józef Wojnarowski

- 17:20-17:40 **Patents from the Age of Prussian Industrialization Revived**  
*Ulf Doering, Torsten Brix, Benedikt Artelt, Christiane Brandt-Salloum*
- 17:40-18:00 **On the History of the Discovery of the Subgroups of the Euclidean Group**  
*Jose Rico, J. Jesús Cervantes-Sánchez, Emilia Olivares-Conraud*
- 18:00-18:20 **Academicism I.I.Artobolevski. The Beginning of Life Path**  
*Vera Chinenova*
- 18:20-18:40 **ZDZISŁAW PARSEWSKI (1924 -1999) - PROFESSOR OF TWO UNIVERSITIES**  
**Technical University of Lodz, Poland and Technical University of Melbourne, Australia. Member and President of The Technical Committee of Rotordynamics IFToMM**  
*Janusz Wawrzecki*
- 19:00-20:30 **MEETING: TC for Vibration**  
*Juan C. Jauregui Correa*

## Small Hall

- 14:30-16:30 **Session 1 Education**  
*Cristina Castejon, Eduard Krylov*
- 14:30-14:50 **Dimensional synthesis of a cam profile using the method of closed vector contours in the MMS study course**  
*Boris Kosenok, Valeriy Balyakin, Eduard Krylov*
- 14:50-15:10 **Systematic Use of Velocity and Acceleration Coefficients in the Kinematic Analysis of Single-DOF Planar Linkages**  
*Raffaele Di Gregorio*
- 15:10-15:30 **Method of vector closed contours in design problems of study course "internal combustion engines: kinematics and dynamics"**  
*Boris Kosenok, Valerii Balyakin, Eduard Krylov*
- 15:30-15:50 **Optimum dimensional synthesis using GIMSINT software**  
*Mónica Urizar, Aitor Muñozerro, Enrique Amezua, Alfonso Hernández*
- 15:50-16:10 **An Experimental Setup for the Introduction of High School and Undergraduate Students to Vibration and Mechatronics Topics**  
*Luca Bruzzone, Giovanni Berselli, Francesco Crenna, Pietro Fanghella*
- 16:10-16:30 **Robotic Education at IGMR**  
*Burkhard Corves, Mathias Hüsing, Stefan-Octavian Bezrucav, Nils Mandischer, Markus Schmitz*
- 16:30-17:00 Coffee & Poster Session

- 17:00-19:00 **Session 2 Education**  
*Eduard Krylov, Cristina Castejon*
- 17:00-17:20 **3D Application for Modeling of Involute Gear Manufacturing as the Assistance Solution for TMM Training**  
*Andrei Vukolov, Alexander Titov, Gleb Prokurat, Margarita Lapteva*
- 17:20-17:40 **Predicting student academic performance in Machine elements course**  
*Daniel Miler, Marija Majda Perišić, Robert Mašović, Dragan Žeželj*
- 17:40-18:00 **On Teaching of Mechanical Design Course for Undergraduates**  
*Weizhong Guo*
- 18:00-18:20 **Mobile Machines Easily Assembled with Planar Link Parts for Designing and Prototyping Practice to Inspire Junior/Senior High School Students**  
*Nobuyuki Iwatsuki*
- 18:20-18:40 **On Higher-Pair Modelling in Planar Mechanisms**  
*Raffaele Di Gregorio*
- 19:00-20:30 **MEETING: PC for Education**  
*Cristina Castejon*

## Seminar Room

- 14:30-16:30 **Session 1 Vibration**  
*Wiesław Staszewski, Dao Phong*
- 14:30-14:50 **Experiment Design of Bi-stable Oscillator for Electromagnetic Induction Energy Harvesting**  
*Tian-Yau Wu, C. C. Yeh*
- 14:50-15:10 **Transmission of Vibrations through Vibration Isolators, Theory and Application**  
*Stanislav Ziaran, Ondrej Chlebo, Michal Cekan, Jiri Tuma*
- 15:10-15:30 **Simplified Map-based Selection of Optimal Spindle Speeds When Milling Complex Structures**  
*Krzysztof Kaliński, Marek Galewski, Michał Mazur*
- 15:30-15:50 **Robust model-based trajectory planning for flexible mechanisms: experimental assessment**  
*Paolo Boscariol, Dario Richiedei, Alberto Trevisani*
- 15:50-16:10 **Comparative Stability Analysis of Chatter in Grinding Process**  
*Milenko Stegic, Nikola Vranković, Marko Rastija, Željko Goja, Danijel Barjašić*
- 16:10-16:30 **Optimal Model Reference Command Shaping for vibration reduction of Multibody-Multimode flexible systems: Initial Study**  
*Gerardo Pelaez, Higinio Rubio, Estela Souto, Juan Carlos Garcia-Prada*

- 16:30-17:00 Coffee & Poster Session
- 17:00-19:00 **Session 2 Gearing and transmission**  
*Stanislaw Zawislak, Yaping Zhao*
- 17:00-17:20 **Multi-Objective Optimization of Hypoid Gears to Improve Operating Characteristics**  
*Vilmos Simon*
- 17:20-17:40 **Prospects of Creation of Mechanisms with Two Degree of Freedom**  
*Konstantin Ivanov*
- 17:40-18:00 **Performance Evaluation of Automatic Labeling System of Crack Length at Tooth Root and Examination of Erroneous Detection**  
*Daisuke Iba, Yusuke Tsutsui, Yunosuke Ishii, Bui Huy Kien, Nanako Miura, Takashi Iizuka, Arata Masuda, Akira Sone, Ichiro Moriwaki*
- 18:00-18:20 **Design and experience of a test-bed for gearboxes**  
*Claudia Aide Gonzalez Cruz, Marco Ceccarelli, Mario Alimehmeti, Juan Carlos Jauregui Correa*
- 18:20-18:40 **Static mesh stiffness decomposition in hybrid metal-composite spur gears**  
*Nicola Contartese, Piervincenzo Giovanni Catera, Domenico Mundo*
- 18:40-19:00 **Application of Contour Equations to Kinematic Analysis of Complex and Compound Planetary Gears**  
*Józef Wojnarowski, Józef Drewniak, Tomasz Kądziołka, Jerzy Kopeć, Konrad Stańco, Stanisław Zawislak*
- 19:00-20:30 **MEETING: TC for Gearing and Transmission for Vibration**  
*Frank Helmut Schaefer*

## **Conference Room**

- 14:30-16:30 **CableCon "Design"**  
*Andreas Pott*
- 14:30-14:50 **Planar Cable-Driven Robots with Enhanced Orientability**  
*M. Vikranth Reddy, N. C. Praneet, G. K. Ananthasuresh*
- 14:50-15:10 **Chain Driven Robots: An Industrial Application Opportunity**  
*Guillermo Rubio-Gómez, David Rodríguez-Rosa, Jorge A. García-Vanegas, Antonio Gonzalez-Rodríguez, Fernando J. Castillo-García, Erika Ottaviano*
- 15:10-15:30 **Non-slipping Conditions of Endless-Cable Driven Parallel Robot by New Interpretations of the Euler-Eytelwein's Formula**  
*Takashi Harada, Koki Hirotsato*



- 15:30-15:50 **Analysis of Cable-Configurations of Kinematic Redundant Planar Cable-Driven Parallel Robot**  
*Koki Hiroato, Takashi Harada*
- 15:50-16:10 **Improving cable length measurements for large CDPR using the Vernier principle**  
*Jean-Pierre Merlet*
- 16:30-17:00 Coffee & Poster Session
- 17:00-19:00 **CableCon "Kinematics and Static"**  
*Jean-Pierre Merlet*
- 17:00-17:20 **Stiffness of Planar 2-DOF 3-Differential Cable-Driven Parallel Robots**  
*Lionel Birglen, Marc Gouttefarde*
- 17:20-17:40 **Practical Stability of Under-Constrained Cable Driven Parallel Robots**  
*Dragoljub Surdilovic, Jelena Radojicic*
- 17:40-18:00 **Singularity Characteristics of a Class of Spatial Redundantly actuated Cable-suspended Parallel Robots and Completely actuated ones**  
*Lewei Tang, Xiaoqiang Tang*
- 18:00-18:20 **Kinetostatic Modeling of a Cable-Driven Parallel Robot using a Tilt-Roll Wrist**  
*Saman Lessanibahri, Philippe Cardou, Stephane Caro*
- 18:20-18:40 **Static Analysis of a Two-Platform Planar Cable-Driven Parallel Robot with Unlimited Rotation**  
*Thomas Reichenbach, Philipp Tempel, Alexander Verl, Andreas Pott*
- 19:00-20:30 **MEETING: PC for the Standardization of Terminology**  
*Brix Thorsten*

## Tuesday 2<sup>nd</sup> July

### Large Hall A

- 08:00-9:00 **Keynote Speakers: Kazuya Yoshida**  
**Space Robotics**
- 09:00-11:00 **Session 1 Robotics**  
*Kensuke Harada, Daniele Cafolla*
- 09:00-09:20 **Selection of a manipulator configuration during off-line path planning in Point-to-Point positioning**

- Wojciech Lisowski, Jaroslaw Bednarz*
- 09:20-09:40 **Artificial Neural Network Based Kinematics: Case Study on Robotic Surgery**  
*Ahmed JR. Almusawi, Lale Canan Dulger, Sadettin Kapucu*
- 09:40-10:00 **Kinematic Design of a 2-SPS/PU&R 4-DOF Hybrid Robot for Ankle Rehabilitation**  
*Ruiqin Li, Xiaogin Fan, Xiang Li, Shanping Bai, Jianwei Zhang*
- 10:00-10:20 **Smooth path planning for redundant robots on collision avoidance**  
*Henrique Simas, Daniel Martins, Raffaele Di Gregorio*
- 10:20-10:40 **Profile estimation of a cable-driven continuum robot with general cable routing**  
*K. P. Ashwin, Ashitava Ghosal*
- 10:40-11:00 **Prismatic Compliant Joint for Safe Cobots**  
*Juan Sandoval Arevalo, Med Amine Laribi, Saïd Zegloul*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Robotics**  
*Mehmet İsmet Can, Carl Nelson*
- 11:30-11:50 **Intelligent control and simulation study for field flexible heavy duty robot**  
*Kunming Zheng, Youmin Hu, Bo Wu, Tielin Shi*
- 11:50-12:10 **On the Dynamics of a Ball Rolling on a Tipping Plane**  
*Luis Laus, Jon Selig*
- 12:10-12:30 **System Design and Experimental Analysis of an All-environment Mobile Robot**  
*Ziyi Guo, Yiduo Zhu, Meiling Wang, Tao Li, Hanbin Zhao, Linsen Xu, Marco Ceccarelli*
- 12:30-12:50 **A 2 dof continuum parallel robot for pick&place collaborative tasks**  
*Francisco Campa, Mikel Diez, Daniel Diaz-Caneja, Oscar Altuzarra*
- 12:50-13:10 **Track drives adjustment simulation for a versatile pipe inspection robot**  
*Michał Ciszewski, Tomasz Buratowski, Mariusz Giergiel*
- 13:10-13:30 **Advances on the development of a robotic hand with movable palm**  
*Francisco Javier Espinosa-Garcia, Manuel Arias-Montiel, Marco Ceccarelli, Esther Lugo-Gonzalez, Giuseppe Carbone*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Robotics**  
*Eduardo Castillo-Castañeda, Huiping Shen*

- 14:30-14:50 **A Lumped Model for Dynamic Behavior Prediction of a Hybrid Robot for Optical Polishing**  
*Chenqlin Dong, Haitao Liu, Tian Huang, Derek G. Chetwynd*
- 14:50-15:10 **Trajectory Design Based on Joint Impact Index for Detecting Joint Clearance in Parallel Robot**  
*Masumi Ohno, Yukio Takeda*
- 15:10-15:30 **Two-Stage Picking Method for Piled Shiny Objects**  
*Yuya Sato, Kensuke Harada, Nobuchika Sakata, Weiwei Wan, Ixchel G. Ramirez-Alpizar*
- 15:30-15:50 **A 3D Vision Tracking Method for Mechanism Validation**  
*Daniele Cafolla, Matteo Russo, Betsy Dayana Marcela Chaparro Rico*
- 15:50-16:10 **Control Methods for a Teleoperated Endoscope Robot**  
*Ogulcan Isitman, Mehmet İsmet Can Dede*
- 16:10-16:30 **Dynamic modeling and control of a tensegrity manipulator mimicking a bird neck**  
*Benjamin Fasquelle, Matthieu Furet, Christine Chevallereau, Philippe Wenger*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Robotics**  
*Tobias Ortmaier, Daisuke Matsuura*
- 17:00-17:20 **Dynamic modeling of a new over-actuated compliant joint mechanism for human limb rehabilitation**  
*Narek Zakaryan, Sarik Ghazaryan, Mikayel Harutyunyan, Yuri Sarqsyán*
- 17:20-17:40 **Feedforward control for the kinematically redundant manipulator 3PRRR**  
*Joao Vitor Carvalho Fontes, Natassya Barlate Floro da Silva, Maira Martins da Silva*
- 17:40-18:00 **Tail Design of A Miniature Two-Wheg Climbing Robot for External Transitioning**  
*Audelia Dharmawan, Darren Koh, Gim Song Soh, Shaohui Foong, Roland Bouffanais, Kristin Wood*
- 18:00-18:20 **A Practicle Obstacle Avoidance Method Using Q-Learning with Local Information**  
*Eric Jauru Tseng, Eugene Yang, Shih-Chieh Chen, Jau-Liang Chen*
- 18:20-18:40 **Design of a Novel Compact Adaptive Ankle Exoskeleton for Walking Assistance**  
*Yixin Shao, Wuxiang Zhang, Kun Xu, Xilun Ding*
- 18:40-19:00 **Exploiting Natural Dynamics in order to Increase the Feasible Static-Wrench Workspace of Robots**  
*Rafael Balderas Hill, Sébastien Briot, Abdelhamid Chriette, Philippe Martinet*

19:00-20:30 **MEETING: TC for Tribology**  
*Dae-Eun Kim*

## **Large Hall B**

09:00-11:00 **Session 1 Biomechanical engineering**  
*Med Amine Laribi, Walter Franco*

09:00-09:20 **Cable driven robot for lower limb rehabilitation: motion specifications and design process**  
*Med Amine Laribi, Giuseppe Carbone, Said Zegloul*

09:20-09:40 **Influence of hinge positioning on human joint torque in industrial trunk exoskeleton**  
*Elisa Panero, Giovanni Gerardo Muscolo, Laura Gastaldi, Stefano Pastorelli*

09:40-10:00 **An Exoskeleton Design Robotic Assisted Rehabilitation: Wrist &Forearm**  
*Mehmet Erkan Kutuk, Memik Taylan Das, Lale Canan Dulger*

10:00-10:20 **Design and kinematics of a new leg exoskeleton for human motion assistance**  
*Ionut Daniel Geonea, Nicolae Dumitru, Daniela Tarnita, Paul Rinderu*

10:20-10:40 **Theoretical Joint Load Analysis of a Novel Prosthetic Digit Design**  
*Shao Liu, Matthew Van, Zijue Chen, Chao Chen*

11:00-11:30 Coffee

11:30-13:30 **Session 2 Linkage and mechanical control**  
*Victor Petuya, Giuseppe Quaglia*

11:30-11:50 **Synthesis of Spatial mechanism CS-3SS for Multi-Phase Body Guidance**  
*Wen-Yeuan Chung*

11:50-12:10 **Synthesis of Double-Rocker Mechanisms for Motion Generation Using Fourier Descriptor**  
*Cheng-Yuan Hsieh, Win-Bin Shieh, Ching-Kong Chen, Jyh-Jone Lee*

12:10-12:30 **Exact Synthesis of a 1-dof Planar Linkage for Visiting 10 Poses**  
*Shaoping Bai*

12:30-12:50 **Design and Control Methodology of a Cable Driven Active Spatial Rolling Contact Pair**  
*Naoto Kimura, Nobuyuki Iwatsuki, Ikuma Ikeda*

12:50-13:10 **Toward Kinematic Analysis of Rotary Hexapod with Single Drive**  
*Alexey Fomin, Victor Glazunov*

- 13:10-13:30 **Determination of Member Lengths for Building a Regular Tensegrity Structure: An Analytical Study**  
*P. K. Malik, Anirban Guha, P. Seshu*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Linkage and mechanical control**  
*Chin-Hsing Kuo, Domenico Mundo*
- 14:30-14:50 **Realization of Statically Balanced Articulated Mechanisms and Scotch Yoke Type Balancers**  
*Hong-Nguyen Nguyen, Win-Bin Shieh*
- 14:50-15:10 **Development of an ultrasonic controlled growing rod system for spinal implants**  
*Hidetsugu Terada, Koji Makino, Yudai Kitano, Tomohiro Natori, Takaaki Ishii*
- 15:10-15:30 **Kinematic Synthesis of Planar 4-Bar Path Generators for Finite Line Positions**  
*Gokhan Kiper, Eres Soylemez*
- 15:30-15:50 **A new Approach to Determine the Main Dimensions of Complex Cam Mechanisms**  
*Mario Mueller, Maximilian Hoffmann, Mathias Hüsing, Burkhard Corves*
- 15:50-16:10 **Parallel manipulator of a class RoboMech for generation of horizontal trajectories family**  
*Zhumadil Baigunchekov, Zhadyra Zhumasheva, Myrzabai Izmambetov, Talgat Baigunchekov, Azamat Mustafa*
- 16:10-16:30 **Analysis of the Design Process of Mechanisms for Space Applications**  
*Bartosz Widera*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Linkage and mechanical control**  
*Erwin Lovasz, Burkhard Corves*
- 17:00-17:20 **Type Synthesis of Self-Aligning Mechanisms Applied to the Leg Rest Section of an Hospital Bed**  
*Vinicius N. Artmann, Rodrigo L. P. Barreto, Andrea P. Carboni, Roberto Simoni, Daniel Martins*
- 17:20-17:40 **Design of an active reconfigurable 2R joint**  
*Mykhailo Riabtsev, Victor Petuya, Aitor Riera, Erik Macho*
- 17:40-18:00 **Geometric synthesis method for function generation of steering control mechanism with four positions**  
*Hanchao Wang, Song Lin*

- 18:00-18:20 **A Speed Control Algorithm and Motion Stability Evaluation Method for Parallel Machine Tools**  
*Yanbing Ni, Junjie Chen, Hepeng Fan, Xiance Liu*
- 18:20-18:40 **Wearable gravity balanced orthosis for lower limb with a special transmission mechanism**  
*Rany Rizk*
- 18:40-19:00 **Synthesis of Midline to Apex Type Griffis-Duffy Platforms using the Geometric Construction Method**  
*Chenqwei Shen, Jingjun Yu, Xu Pei, Lubin Hang*
- 19:00-20:30 **MEETING: TC for Linkage and Mechanical Control**  
*Victor Petuya*

## **Medium Hall A**

- 09:00-11:00 **Session 1 Computational Kinematics**  
*Daniel Martins, Manfred Husty*
- 09:00-09:20 **Modeling and Displacement Analysis of Origami Spring Considering Collision and Deformation of Components**  
*Hiroshi Matsuo, Daisuke Matsuura, Yusuke Sugahara, Yukio Takeda*
- 09:20-09:40 **Kinematic Tangent Cone -A useful Concept for the local Mobility and Singularity Analysis**  
*Andreas Mueller*
- 09:40-10:00 **Parametric euler-savary equations for spherical instantaneous kinematics**  
*Osman Acar, Ziya Saka, Ziya Ozcelik*
- 10:00-10:20 **Passive Rotation of Rotational Joints and Its Computation Method**  
*Shucen Du, Josef Schlattamn, Stefan Schulz, Arthur Seibel*
- 10:20-10:40 **Topological Analysis of a Partially Decoupled 3T1R Parallel Mechanism with Zero Coupling Degree**  
*Huiping Shen, Guanglei Wu, Zhengxiao Xu, Jiaming Deng*
- 10:40-11:00 **A Novel Dual-Matrix Method for Displacement Analysis of Spatial Linkages**  
*Yu Zhang, Song Lin, Jiang Jingyu*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Computational Kinematics**  
*Huiping Shen, Andreas Müller*
- 11:30-11:50 **Kinematic Performance Analysis and Comparison for the Exechon-like PKMs Based on a Kinematic Tuning Index**

- Tengfei Tang, Hanliang Fang, Jun Zhang*  
 11:50-12:10 **Manfred Husty: A Short Biography of his Scientific Life**  
*Martin Pffurner, Hans-Peter Schröcker*
- 12:10-12:30 **Kinematic Modelling of Plugs and Sockets: Assembling, Mobility and Redundant Constraints**  
*Vinicius N. Artmann, Luan Meneghini, Rodrigo L. P. Barreto, Daniel Martins*
- 12:30-12:50 **Analytical Kinematic Analysis of Cam Mechanisms in MechDev**  
*Agnes Beckermann, Mario Mueller, Mathias Huesing, Burkhard Corves*
- 12:50-13:10 **Multi-criteria design optimization of cam mechanisms combining different splines given by checkpoints**  
*Léo Moussafir, Vigen Arakelian*
- 13:10-13:30 **Dual-quaternion on simple scissor-like elements**  
*Juan Guerrero Grijalva, Edson De Pieri, Daniel Martins*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Computational Kinematics**  
*Erika Ottaviano, Sandipan Bandyopadhyay*
- 14:30-14:50 **Building Dynamic Stiffness Matrix Library of Flexure Members for Use in a Dynamic Stiffness Model of Compliant Mechanisms**  
*Mingxiang Ling*
- 14:50-15:10 **Kinematics Analysis of a novel Deployable Inner Support Fixture for Fuel Tank's Circumferential Girth Welding Process**  
*Haiyu Wu, Genliang Chen, Hao Wang, Zhentao Chen, Shunzhou Huang*
- 15:10-15:30 **Dynamic modeling and verification of the flexure-based vibration table**  
*Qian Liu*
- 15:30-15:50 **Study on Radial and Axial Errors of Spindles with Invariants of Rotational Error Motion Zhipeng**  
*Fan, Zhi Wang, Delun Wang*
- 15:50-16:10 **Flat lever mechanisms: new strategy for kinematic analysis and computer simulation of motion**  
*Alexander Evgrafov, Dmitry Babichev, Sergey Lebedev*
- 16:10-16:30 **A fast branch-and-prune algorithm for the position analysis of spherical mechanisms**  
*Arya Shabani, Soheil Srabandi, Josep M. Porta, Federico Thomas*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Computational Kinematics**  
*Delun Wang, Sergey Lebedev*

- 17:00-17:20 **Lever mechanisms: the new approach to structural synthesis and kinematic analysis**  
*Dmitry Babichev, Alexander Evgrafov, Sergey Lebedev*
- 17:20-17:40 **Identification of the largest singularity-free cylinders in the translational workspace of the semi-regular Stewart platform manipulator**  
*Prem Prasad, Sandipan Bandyopadhyay*
- 17:40-18:00 **Numerical method of working area approximation of the tripod robot taking into account the singularity zones**  
*Larisa Rybak, Elena Gaponenko, Dmitry Malyshev*
- 18:00-18:20 **Gateway Points on Scara Parallel Robots. Ultrafast Pick and Place Operations**  
*Andrea Martín-Parra, David Rodríguez-Rosa, Luis Corral-Gómez, Jesús Rosado-Linares, Fernando J. Castillo-García, Erika Ottaviano*
- 18:20-18:40 **Five Position Synthesis of a Planar Four-Bar Linkage**  
*Jeffrey Glabe, J. Michael McCarthy*
- 18:40-19:00 **Parametrically Modeled DH Table for Soft Robot Kinematics: Case Study for A Soft Gripper**  
*Po Ting Lin, Ebrahim Shahabi, Kai-An Yang, Yu-Ta Yao, Chin-Hsing Kuo*
- 19:00-20:30 **MEETING: TC for Computational Kinematics**  
*Volkert van der Wijk*

## **Medium Hall B**

- 09:00-11:00 **Session 1 Design Methodology**  
*I-Ming Chen, Xianmin Zhang*
- 09:00-09:20 **A Grammar-Based Functional Synthesis Approach for Complex Mechanisms through Assigning Functional Requirements to Graphic Carriers**  
*Yu-Tong Li, Yu-Xin Wang*
- 09:20-09:40 **Gravity balancing of a hoist by means of a four-bar linkage and spring**  
*Jacek Buśkeiwicz*
- 09:40-10:00 **Design and Analysis of a Series Elastic Component Based on Topology Optimization**  
*Yanjiang Huang, Yeping Wang, Yanlin Chen, Xianmin Zhang*
- 10:00-10:20 **Design and analysis of a cable-driven multistage orderly deployable/retractable space telescopic boom**  
*Chong Zhao, Hongwei Guo, Rongqiang Liu, Zongquan Deng, Bing Li*
- 10:20-10:40 **Compliant Mechanism Synthesis for Guidance Task Based on Geometrical Similarity Transformation**  
*Yu Zhang, Song Lin, Zeyun Song*



- 10:40-11:00 **Method Research and Mechanism Design of Automatic Weaving for Beaded Pads**  
*Simin Ouyang, Ligang Yao, Yongwu Cai, Junlin Lai, Dongliang Lin*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Design Methodology**  
*Nobuyuki Iwatsuki, Qiang Huang*
- 11:30-11:50 **Configuration Evolution Method of Stewart Platform Based on Finite Screw Theory**  
*Tao Sun, Xinming Huo, Panfeng Wang, Yimin Song*
- 11:50-12:10 **A plane strain problem solved by the isogeometric boundary element method**  
*Stephanie Virginia Camacho Gutierrez, Juan Carlos Jauregui Correa*
- 12:10-12:30 **Search of Solution in Task Based Conceptual Design Method**  
*Hrayr Darbinyan*
- 12:30-12:50 **Proposal of a Harmonic Bees Algorithm for Design Optimization of a Gripper Mechanism**  
*Osman Acar, Mete Kalyoncu, Alaa Hassan*
- 12:50-13:10 **Computational simulation and experimental study of cable for cable barriers**  
*Ilya Karpov, Irina Demiyanyushko, Vladimir Nadezhdin*
- 13:10-13:30 **Novel Design of the Actuation-Transmission System for Legged Mobile Lander Considering Large Impact**  
*Youcheng Han, Weizhong Guo*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Mechatronics**  
*Xilun Ding, Meiling Wang*
- 14:30-14:50 **Investigation on the Application of Operating Speed Dependent Motion Profiles in Processing Machines at the Example of Controlling Liquid Slosh**  
*Clemens Troll, Sven Tietze, Jens-Peter Majschak*
- 14:50-15:10 **Application of electronic cams with respect to the representation of the source data of displacement laws**  
*Petr Jirásko, Miroslav Václavík*
- 15:10-15:30 **Dynamics of a Slider-Crank Wind Car With Viscous Friction in Slider**  
*Andrei Holub, Liubov Klimina, Marat Dosaev, Yury Selyutskiy*
- 15:30-15:50 **Design of a Folded Leaf Spring with high support stiffness at large displacements using the Inverse Finite Element Method**

*Jelle Rommers, Just L. Herder*

15:50-16:10 **Robot arm and control architecture integration on a UGV for precision agriculture**

*Giuseppe Quaglia, Carmen Visconte, Leonardo Sabatino Scimmi, Matteo Melchiorre, Paride Cavallone, Stefano Pastorelli*

16:10-16:30 **Design and Development of Compact Ceramics Reinforced Pump with Low Internal Leakage for Electro-Hydrostatic Actuated Robots**

*Mitsuo Komaqata, Tianyi Ko, Yoshihiko Nakamura*

16:30-17:00 Coffee & Poster Sessions

17:00-19:00 **Session 4 Mechatronics**

*Giuseppe Quaglia, Med Amine Laribi*

17:00-17:20 **On the Parallel Nonlinear Piezoelectric Energy Harvesting**

*Jin Xie, Yifeng Ling, Zhaohui Liu*

17:20-17:40 **A Kinematotropic Parallel Mechanism with Three Motion Branches Each of Different Mobility**

*Pablo Lopez-Custodio, Andreas Müller, Jian Dai*

17:40-18:00 **Experiment-aided virtual prototyping to minimize tool-workpiece vibration during boring of large-sized structures**

*Krzysztof J. Kaliński, Marek A. Galewski, Michał R. Mazur, Natalia Morawska*

18:00-18:20 **An Experimental Study on the Effect of Temperature on Acoustic Emission Characteristics in Metallic Structures**

*Phong B. Dao, Marek Fortuna, Wiesław J. Staszewski, Tadeusz Uhl*

18:20-18:40 **Multi-arm Motion Planning of Beijing Astronaut Robot**

*Bowen Qin, Hui Li, Zhihong Jiang, Marco Ceccarelli*

18:40-19:00 **Recent advancement approach for precision agriculture**

*Tomisław Gołębiowski, Tadeusz Juliszewski, Paweł Kiełbasa, Sylwia Tomecka-Suchoń, Tadeusz Uhl*

19:00-20:30 **MEETING: PC for the History of MMS**

*Alessandro Gasparetto*

## **Small Hall**

09:00-11:00 **Session 1 Multibody dynamics**

*Janusz Fraczek, Mariusz Giergiel*

09:00-09:20 **Motion Programs with Better Characteristic Values**

*Kuan-Lun Hsu, Jia Yu Chung*

09:20-09:40 **Multi-Mode Motion System Based on a Multistable Tensegrity Structure**

- Philipp Schorr, Valter Böhm, Gábor Stépán, Lena Zentner, Klaus Zimmermann*  
 09:40-10:00 **Designing of a Crank press on the Basis of High Class Planar Linkages**  
*Assylbek Jomartov, Amandyk Tuleshov, Moldir Kuatova*
- 10:00-10:20 **On the Dynamic Balance of a Planar Four-Bar Mechanism with a Flexible Coupler**  
*Jacob Meijaard, Volkert van der Wijk*
- 10:20-10:40 **Shift: A Dynamics Engine for Simulation and Motion Visualization of Complex Mechanisms and Robotic Systems**  
*Kristopher Wehage, Bahram Ravani*
- 10:40-11:00 **Influence of imperfect joints and geometrical tolerances on a circuit breaker dynamics**  
*Narendra Akhadkar, Vincent Acary, Bernard Brogliato*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Multibody dynamics**  
*Wojciech Lipowski, Tomasz Buratowski*
- 11:30-11:50 **Torque Vectoring in Electric Vehicles with In-wheel Motors**  
*Henrique de Carvalho Pinheiro, Alessandro Messina, Lorenzo Sisca, Alessandro Ferraris, Andrea Giancarlo Airale, Massimiliana Carello*
- 11:50-12:10 **The Moore-Penrose Inverse Approach to Modeling of Multibody Systems with Redundant Constraints**  
*Marek Wojtyra*
- 12:10-12:30 **Direct sensitivity analysis of planar multibody systems in the Hamiltonian framework**  
*Pawel Maciag, Paweł Malczyk, Janusz Frączek*
- 12:30-12:50 **Kinematic Indices of rotation-floating space robots for on-orbit servicing**  
*Mathieu Rognant, Sofiane Kraiem, Jurek Sasiadek*
- 12:50-13:10 **Computational Analysis of Body Stiffness Influence on the Dynamics of Light Commercial Vehicles**  
*Henrique de Carvalho Pinheiro, Alessandro Messina, Lorenzo Sisca, Alessandro Ferraris, Andrea Giancarlo Airale, Massimiliana Carello*
- 13:10-13:30 **Dynamic Analysis of the Stewart Platform for the Motion System of a Driving Simulator**  
*Cristi Irimia, Csaba Antonya, Mihail Grovu, Calin Husar*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Multibody dynamics**  
*Iwona Adamiec-Wójcik, Bartosz Widera*

- 14:30-14:50 **Vibration of a planar linkage structure with flexible support subjected to kinematic task based constraints**  
*Elżbieta Jarzębowska, Krzysztof Augustynek, Andrzej Urbaś*
- 14:50-15:10 **The Grand Piano Action Functioning Demystified thanks to the Multibody Approach**  
*Paul Fiset, Baudouin Bokiau, Sébastien Timmermans*
- 15:10-15:30 **Kinematics and Dynamics Model via Explicit Direct and Trigonometric Elimination of Kinematic Constraints**  
*Moritz Schappler, Torsten Lilge, Sami Haddadin*
- 15:30-15:50 **Dynamic Synthesis of a Crank-Rocker Mechanism Minimizing its Joint-Forces**  
*Claudio Villegas, Mathias Huesing, Burkhard Corves*
- 15:50-16:10 **Modelling of a Rotary Hammer with the Implementation of a Dynamic Eliminator of Vibrations**  
*Tadeusz Majewski, Roberto Sanz Camacho*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Multibody dynamics/Standardization of terminology**  
*Marek Wojtyra, Mariusz Giergiel*
- 17:00-17:20 **Static Force Balancing of a 2R1T Parallel Manipulator with Remote Center of Motion**  
*Abdullah Yaşır, Gokhan Kiper, M. İ. Can Dede, Volkert Van der Wijk*
- 17:20-17:40 **Computational Modeling of Human Lower Limb for Reproduction of Walking Dynamics with Muscles: Healthy and Pathological Cases**  
*Mariana Silva, Bruno Freitas, Paulo Flores, Óscar Carvalho, Daniel Renjewski, João Espregueira-Mendes*
- 17:40-18:00 **Effective Teaching of Mechanism Synthesis using MechAnalyzer Software**  
*Devarshi Pandey, Jai Singh Kushwah, Rajeevlochana G. Chittawadigi, K. Rama Krishna and Subir K. Saha*
- 18:00-18:20 **Free vibration of compliant mechanisms consisting of Euler-Bernoulli beams**  
*Nikola Nestic, Lena Zentner*
- 18:20-18:40 **New and Revised Mechanism Classifications: Proposal and Motivation**  
*Petru A. Simionescu*
- 18:40-19:00 **THEDI: The first online editor for the IFToMM dictionary**  
*Benedikt Artelt, Torsten Brix, Ulf Döring*
- 19:00-20:30 **MEETING: TC for Gearing and Transmission**  
*Frank Helmut Schaefer*

## Seminar Room

- 09:00-11:00 **Session 1 Gearing and transmission**  
*Vilmos Simon*
- 09:00-09:20 **Geometry and Contact Patterns of Crossed-Axes Helipoid Gears Generated by Helical Shapers**  
*Yi-Cheng Chen, Yi-Tao Lin, Chia-Chang Liu*
- 09:20-09:40 **Nonlinear dynamics of single-stage gear transmission**  
*Józef Wojnarowski, Jerzy Margielewicz*
- 09:40-10:00 **Involute Self-braking Inverse Gears. Geometry of External and Internal Engagement**  
*Olga Egorova, Victor Panjukhin, Marina Samoilova, Gennady Timofeev*
- 10:00-10:20 **A Novel Gear Shifting Strategy for Dual Clutch Transmission System Using Reverse Engineering and Robust Design Technique**  
*Manish Chandra, Pranab Dan*
- 10:20-10:40 **Influence of the phase in planetary gears load sharing and transmission error**  
*Javier Sanchez-Espiga, Alfonso Fernandez del Rincon, Miguel Iglesias, Fernando Viadero*
- 10:40-11:00 **Effects of Eccentric Errors on the Transmission Errors and the Backlashes of Planetary Gear Drives**  
*Shyi-Jeng Tsai, Qi-You Zhuang, Siang-Yu Ye*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Transportation Machinery**  
*Vladimir Vantsevich Patryk Marian*
- 11:30-11:50 **Method to provide simple tool for combination vehicle dimensioning**  
*Miro-Tommi Tuutijarvi, Ville Pirnes, Mauri Haataja*
- 11:50-12:10 **City Car Drag reduction by means of shape optimization and add-on devices**  
*Alessandro Ferraris, Andrea Giancarlo Airale, Davide Berti Polato, Alessandro Messina, Shuang Xu, Paolo Massai, Massimiliana Carello, Carvalho Pinheiro*
- 12:10-12:30 **Dynamic Analysis and Control of a Dual Mode Electrically Variable Transmission**  
*Valerio Tinelli, Enrico Galvagno, Mauro Velardocchia*
- 12:30-12:50 **Identification of heavy machines impact on soil using Ground Penetrating Radar**  
*Akinniyi Akinsunmade, Jerzy Karczewski, Sylwia Tomecka-Suchoń, Tadeusz Uhl, Pawel Pysz*

- 12:50-13:10 **Calculated Modes for Assessing Operation Properties and Dependability of Vehicles**  
*Vladimir Algin, Victor Starzhinsky*
- 13:10-13:30 **Crack detection in freight railway axles using Power Spectral Density and Empirical Mode Decomposition Techniques**  
*Alejandro Bustos, Higinio Rubio, Jesus Meneses, Cristina Castejon, Juan Carlos Garcia-Prada*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Transportation Machinery**  
*Mauro Velardocchia, Tomasz Buratowski*
- 14:30-14:50 **A variable friction centre plate**  
*Jose Antonio Romero Navarrete, Frank Otremba*
- 14:50-15:10 **Novel Mechanisms to Improve the Start Quality of Automotive Engines**  
*Madhusudan Raghavan*
- 15:10-15:30 **A New Approach for Estimating Tire-Road Longitudinal Forces for a Race Car**  
*Guido Napolitano Dell'Annunziata, Basilio Lenzo, Flavio Farroni, Aleksandr Sakhnevych, Francesco Timpone*
- 15:30-15:50 **Stability of Heavy Vehicles: Effect of the Road**  
*Gonzalo Moreno, Rodrigo Vieira, Daniel Martins*
- 15:50-16:10 **Experimental assessing of the rail forces due to bogies' centre plate friction**  
*Jose Antonio Romero Navarrete, Frank Otremba, Gerardo Hurtado Hurtado*
- 16:10-16:30 **Correction of Long Vehicle Off Tracking by Multiple Axle Steering** *Francesco Sorage*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Transportation Machinery**  
*Basilio Lenzo, Krzysztof Kołodziejczyk*
- 17:00-17:20 **Oblique testing of a partially filled tank on a tilt table**  
*Frank Otremba, Jose Antonio Romero Navarrete*
- 17:20-17:40 **Mechanisms Design Issues of a Student-Built Off-Road Utility Vehicle**  
*Petru A. Simionescu, Wei Sun*
- 17:40-18:00 **Numerical simulation of geothermal water flow in a deep multistage centrifugal pump**  
*Marijonas Bogdevicius, Jolanta Januteniene, Rimantas Didziokas, Vytautas Bardaitis*
- 18:00-18:20 **Design Issues for Tracked Boat Transporter Vehicles**

- 18:20-19:00 Luca Bruzzone, Giovanni Berselli, Pietro Bilancia, Pietro Fanghella  
**State Observers for Terrain Mobility Controls: A Technical Analysis**  
Vladimir Vantsevich, David Gorsich, Andriy Lozynskyy, Lyubomyr Demkiv,  
Taras Borovets
- 19:00-20:30 **MEETING: TC for Transportation Machinery**  
Vladimir Vantsevich

## Conference Room

- 09:00-11:00 **CableCon "Plenary" - Keynote Speaker/Workshops**  
*Moderation: Tobias Bruckmann, Andreas Pott*
- 11:00-11:30 Coffee
- 11:30-13:30 **CableCon "Workspace"**  
*Leila Notash*
- 11:30-11:50 **Calculation of the cable-platform collision-free total orientation workspace of cable-Driven parallel robots**  
*Marc Fabritius, Christoph Martin, Andreas Pott*
- 11:50-12:10 **Workspace Analysis of Cable Parallel Manipulator for Side Net Cleaning of Deep Sea Fishing Ground**  
*Liping Wang, Haisheng Li, Zhufeng Shao, Zhaokun Zhang, Fazhong Peng*
- 12:10-12:30 **Identifying the largest sphere inscribed in the position workspace of a spatial parallel manipulator driven by seven cables**  
*Ambuj Shahj, Sandipan Bandyopadhyay*
- 12:30-12:50 **A Bounding Volume of the Cable Span for Fast Collision Avoidance Verification**  
*Marc Gouttefarde, Maximilian Lesellier*
- 12:50-13:10 **Computation of the interference-free wrench feasible workspace of a 3-DoF translational tensegrity robot**  
*Marc Arsenault*
- 13:30-14:30 Lunch
- 14:30-16:30 **CableCon "Control"**  
*Philippe Cardou*
- 14:30-14:50 **Criteria for Workspace Characterization of Spatial Cable-Driven Robots**  
*Leila Notash*

- 14:50-15:10 **Robust Adaptive Control of actuated Cable-Driven Parallel Robots**  
Alireza Izadbakhsh, *Hamed Jabbari Asl, Tatsuo Narikiyo*
- 15:10-15:30 **Model Predictive Control of Large-Dimension Cable-Driven Parallel Robots**  
*João Cavalcanti Santos, Ahmed Chemori, Marc Gouttefarde*
- 15:30-15:50 **Linearised Feedforward Control of a Four-Chain Crane Manipulator**  
*Michael Stoltmann, Pascal Froitzheim, Normen Fuchs, Wilko Flügge, Christoph Woernle*
- 15:50-16:10 **An experimental study on control accuracy of FAST cable robot following zigzag astronomical trajectory**  
*Hui Li, Mingzhe Li*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-19:00 **Session 4 Tribology**  
*Jose Danielle De Mello, Enrico Ciulli*
- 17:00-17:20 **Effect of Carbonaceous Hard Coatings Overcoat on Friction and Wear Properties for Al Alloy Sliding Bearing in Oil Lubrication**  
*Noritsugu Umehara, Tomoki Kitamura, Shigehiro Ito, Takayuki Tokoroyama, Motoyuki Murashima, Manabu Izumida, Naohisa Kawakami*
- 17:20-17:40 **Tribological Self-healing Coating based on Hydrogel**  
*Chang-Lae Kim, Hae-Jin Kim, Dae-Eun Kim*
- 17:40-18:00 **Lubrication of Carbon-based Coatings**  
*Hae-Jin Kim, Chang-Lae Kim, Dae-Eun Kim*
- 18:00-18:20 **Problems in Friction Analysis**  
*Nikolai Myshkin, Andrei Grigoriev*
- 18:20-18:40 **Design and Built of a Micro-Tribometer with High Vacuum and Low Temperature**  
*Pu Wu, Chenhui Zhang, Jianbin Luo*
- 18:40-19:00 **Simulation of Tilting-pad Journal Bearing Equipped with Cooled Pads**  
*Steven Chatterton, Andrea Vania, Paolo Pennacchi*
- 19:00-20:30 **MEETING: TC for Micromachines**  
*Lena Zentner*

## Wednesday 3<sup>rd</sup> July

### Large Hall A

- 08:00-9:00 Keynote Spekers: *Oussama Khatib*



## The Era of Human-Robot Collaboration: Deep Sea Exploration

- 09:00-11:00 **Session 1 Robotics**  
*Mathias Huesing, Doina Pisla*
- 09:00-09:20 **Multi-dimensional Error Identification during Robotic Snap Assembly**  
*Yusuke Hayami, Peihao Shi, Weiwei Wan, Ixchel G. Ramirez-Alpizar, Kensuke Harada*
- 09:20-09:40 **Kinematic Compatible Elbow Exoskeletons with Static Balance**  
*Chi-Shiun Jhuang, Jin-An Bao, Dar-Zen Chen*
- 09:40-10:00 **Design of Partially Balanced Planar 5R Symmetrical Parallel Manipulators via an Optimal Motion Planning**  
*Jing Geng, Vigen Arakelyan*
- 10:00-10:20 **End-point Deflection of a Serial Planar Manipulator with and without Static Balance by Using Springs**  
*Chi-Shiun Jhuang, Dar-Zen Chen*
- 10:20-10:40 **Multi-Head Path Planning of SwarmItFIX Agents: A Markov Decision Process Approach**  
*Satheeshkumar Veermani, Sreekumar Muthuswamy, Keerthi Sagar, Matteo Zoppi*
- 10:40-11:00 **Design and Analysis of Translational Joint Using Corrugated Flexure Units with Variable-thickness Segments**  
*Nianfeng Wang, Zhiyuan Zhang, Xianmin Zhang*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Robotics**  
*Yoshihiko Nakamura Nianfeng Wang*
- 11:30-11:50 **Design and Characterization of a Gearbox Joint for Manipulators**  
*Konstantin Ivanov, Marco Ceccarelli, Gulsara Yestemessova, Yerkebulan Nurgizat, Gani Balbayev*
- 11:50-12:10 **Simplified Method for Humanoid Robot Gait Generation**  
*Maksymilian Szumowski, Magdalena Sylwia Żurawska, Teresa Zielińska*
- 12:10-12:30 **Motion Analysis of an Omnidirectional Mobile Robot with Wheels Connected by Passive Sliding Joints**  
*Tatsuro Terakawa, Masaharu Komori, Kippe Matsuda*
- 12:30-12:50 **Key Features of the Coupled Hand-operated Balanced Manipulator (HOBM) and Lightweight Robot (LWR)**  
*Yang Zhang, Vigen Arakelyan, Baptiste Véron, Damien Chablat*
- 12:50-13:10 **Resonant Delta Robot for Pick-and-Place Operations**

- Juan Pablo Barreto, Burkhard Corves*
- 13:10-13:30 **Study of Artificial Vision on the Adaptive Filter Basis for Implementation in Robotic Systems**  
*Arailym Nussibaliyeva, Giuseppe Carbone, Aigerim Mussina, Gani Balbayev*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Robotics**  
*Vigen Arakelyan, Masaharu Komori*
- 14:30-14:50 **Stability analysis of an asbestos removal mobile manipulator for safe grinding trajectories**  
*Siddharth Maraje, Jean-Christophe Fauroux, Chedli-Belhassen Bouzgarrou, Lounis Adouane*
- 14:50-15:10 **Kinematics and Workspace of a Spherical Engraving Machine with the RPR/RRPR Parallel Configuration**  
*Ruiqin Li, Shijie Liang, Maorong Zhnag, Jianwei Zhang, Shaoping Bai*
- 15:10-15:30 **Kinematic Design and Topological Characteristics of a nT1R-type Reconfigurable Parallel Mechanism**  
*Huiping Shen, Yingchun Zhao, Guanglei Wu, Ke Xu*
- 15:30-15:50 **Experimental Validation of a Gait Planning for Obstacle Avoidance Using Mecanum Wheels**  
*Ernesto Christian Orozco-Magdaleno, Daniele Cafolla, Eduardo Castillo-Castañeda, Giuseppe Carbone*
- 15:50-16:10 **Heuristic Algorithm for Velocity Scheduling with a Schönflies-Motion Generator**  
*Bruno Belzile, Jorge Angeles*
- 16:10-16:30 **A Gaussian Process Regression Approach to Cooperative Sampling by Underwater Gliders**  
*Tailang Yan, Zhiliang Wu, Wenwen Wang, Lei Meng, Zhongxia Xiang, Sun Tongshuai*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-21:00 General Assembly

## **Large Hall B**

- 09:00-11:00 **Session 1 Computational Kinematics**  
*Doina Pisla, Arvin Rasoulzadeh*

- 09:00-09:20 **Generalized Mobility and Decoupling Conditions of Closed-Loop Mechanism**  
*Fan Zhang, Guohua Cui, Dan Zhang*
- 09:20-09:40 **Kinematic Synthesis of Spherical Four-bar Linkages for Five-Poses Rigid Body Guidance**  
*Giorgio Figliolini, Chiara Lanni, Ramandeep Kaur*
- 09:40-10:00 **Operation modes and workspace of a 4-rRUU Parallel Manipulator**  
*Abhilash Nayak, Stephane Caro, Philippe Wenger*
- 10:00-10:20 **Revised Kinematics of Rope-Bar Variable Geometry Truss Manipulator**  
*Chuanyang Li, Huiyin Yan, Hongwei Guo, Dewei Tang, Rongqiang Liu, Zongquan Deng*
- 10:20-10:40 **Motion Space of Contacting Smooth Curves in Plane Using Screw Derivative**  
*Rama Krishna K, Dibakar Sen*
- 10:40-11:00 **Design and Optimization of a Walking Over-Constrained Mechanism**  
*Ozgun Selvi, Marco Ceccarelli*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Computational Kinematics**  
*Stephane Caro, Giorgio Figliolini*
- 11:30-11:50 **Linear Pentapods with a Simple Singularity Variety - Part I: Determination and Redundant Designs**  
*Arvin Rasoulzadeh, Georg Nawratil*
- 11:50-12:10 **Linear Pentapods with a Simple Singularity Variety - Part II: Computation of Singularity-Free Balls**  
*Arvin Rasoulzadeh, Georg Nawratil*
- 12:10-12:30 **A continuous and computationally efficient method for wrapping a “thick” strand over a surface — The planar single-surface case**  
*Katharina Müller, Andrés Kecskeméthy*
- 12:30-12:50 **Kinematic analysis of a new parallel robotic system for minimally invasive therapy of non-resectable hepatic tumors**  
*Calin Vaida, Paul Tucan, Nicolae Plitea, Viorela Lazar, Nadim Al Hajjar, Doina Pisla*
- 12:50-13:10 **Unied Kinematics of Parallel Schönflies Robots**  
*Paul Zsombor-Murray, Martin Pfulner*
- 13:10-13:30 **3D Modeling and Analysis of Ski Binding Mechanism**  
*Zorana Jeli, Boris Kotic, Misa Stojicevic, Stefan Berdic*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Sustainable energy system**

*Giuseppe Quaglia, Macedon Moldovan*

- 14:30-14:50 **Smog and bad energy conversion. Can new technologies become our allies in this struggle?**  
*Jan Kiciński*
- 14:50-15:10 **Design of the positioning mechanism of a unmanned ground vehicle for precision agriculture**  
*Giuseppe Quaglia, Carmen Visconte, Leonardo Sabatino Scimmi, Matteo Melchiorre, Paride Cavallone, Stefano Pastorelli*
- 15:10-15:30 **Solar Tracking Linkage RSSR for all Latitudes**  
*Ion Visa, Macedon Moldovan*
- 15:30-15:50 **Mathematical Modeling and Simulation of Chaff Cutter Energized by Human Powered Flywheel**  
*Motar Zakiuddin K.S, Singh M.P, Modak J.P.*
- 15:50-16:10 **An application of model predictive control logic to interial sea wave energy converter**  
*Lorenzo Genuardi, Giovanni Bracco, Sergej Antonello Sirigu, Mauro Bonfanti, Panagiotis Dafnakis, Giuliana Mattiazzo*
- 16:10-16:30 **Angular stroke requirements for solar tracking azimuthal mechanism at any latitude**  
*Macedon Moldovan, Ion Visa*
- 16:30-17:00 Coffee & Poster Sessions
- 17:00-21:00 General Assembly

## **Medium Hall A**

- 09:00-11:00 **Session 1 Linkage and mechanical control**  
*Alfonso Hernández, Can Dede*
- 09:00-09:20 **Design and Experimental Validation of a Novel Adjustable Cam-Based Constant Force Mechanism**  
*Godfrey Keung, Chao Chen*
- 09:20-09:40 **A 7R Spatial Linkage for Ankle Rehabilitation with an Arbitrary Ankle Rotation Axis**  
*Chih-Ching Hsieh, Chin-Hsing Kuo, Daisuke Matsuura, Yukio Takeda*
- 09:40-10:00 **An electronic differential control of wheelchair based on PID control**  
*Gao Huang, Weimin Zhang, Fangxing Li, Zhipeng Chi, Jiahao Jin, Marco Ceccarelli, Qiang Huang*
- 10:00-10:20 **Appropriate Synthesis of a Crank Rocker Linkage**

- Joshua Pickard, Juan Antonio Carretero*
- 10:20-10:40 **Type Synthesis Method of Planar and Spherical Mechanisms Using the Universal Structural Table with All Possible Link Assortments**  
*Vladimir Pozhbelko*
- 10:40-11:00 **Novel Actuation Design of an Active Elbow Orthosis**  
*Erwin-Christian Lovasz, Carmen Sticlaru, Cosmina Suci, Corina Mihaela Gruescu, Marco Ceccarelli, Inocentiu Maniu, Cristian Emil Moldovan*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Rotordynamics**  
*Paolo Pennacchi, Ludek Pesek*
- 11:30-11:50 **Effect of Operational Temperature on Contact Dynamics of Shrink-Fitted Compressor Impeller Joint**  
*Eerik Sikanen, Janne Heikkinen, Jussi Sopenen*
- 11:50-12:10 **Resonant Oscillations of a Vertical Hard Gyroscopic Rotor with Linear and Nonlinear Damping**  
*Zharilkassin Iskakov*
- 12:10-12:30 **Stability of a Flexible Rotor-Bearing System with a Transverse Crack**  
*Ahmed Abed, Mohammad Reza Bahrani, Jassim Farij Thijel*
- 12:30-12:50 **Model based identification for paper machine's tube roll**  
*Tuhin Choudhury, Emil Kurvinen, Jussi Sopenen*
- 12:50-13:10 **Controllable magnetically sensitive rotor support element for reducing oscillation and force transmission**  
*Jaroslav Zapoměl, Petr Ferfecki, Jan Kozánek, Leonid Savin*
- 13:10-13:30 **Non-linear modelling of the rotating machine in technical diagnostics. The concept of adequacy intervals and weight functions in the identification procedure**  
*Jan Kiciński*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Rotordynamics**  
*Grzegorz Zywica, Steven Chatterton*
- 14:30-14:50 **Condition Monitoring of Rolling Element Bearing Based on Moving Average Cross-Correlation of Power Spectral Density**  
*Lang Xu, Steven Chatterton, Paolo Pennacchi*
- 14:50-15:10 **Study of dry-friction damping effect on two simplified models of flutter oscillations**

- Ludek Pesek, Ladislav Pust, Pavel Snabl*
- 15:10-15:30 **Properties identification for gas foil bearings - experimental instrumentation and numerical approach**  
*Śławomir Kantor, Jakub Roemer, Jan Pawlik, Grzegorz Żywica, Paweł Bagiński, Adam Martowicz*
- 15:30-15:50 **Investigation of unconventional bearing systems for microturbines**  
*Grzegorz Żywica, Paweł Bagiński*
- 15:50-16:10 **Multifunctional bushing for a gas foil bearing - design and physical prototype construction using 3D printing technology**  
*Jan Pawlik, Jakub Roemer, Śławomir Kantor, Grzegorz Żywica, Paweł Bagiński, Adam Martowicz*
- 16:10-16:30 **3D FE modelling of non-linear dynamics of bladed model disk with dry-friction contacts in tie-bosses**  
*Ludek Pesek, Pavel Snabl, Petr Sulc, Ladislav Pust, Vitezslav Bula*
- 16:30-17:00 Coffee & Poster Sessions

## **Medium Hall B**

- 09:00-11:00 **Session 1 Robotics**  
*Damien Chablat, Xianwen Kong*
- 09:00-09:20 **Adaptive cognitive robot using dynamic perception with fast deep-learning and adaptive on-line predictive control**  
*Liz Rincon, Enrique Coronado, Christopher Law, Gentiane Venture*
- 09:20-09:40 **Research on Structural Design and Trajectory Planning of a New Drilling Floor Robot**  
*Fang Zhao, Youmin Hu, Bo Wu, Tielin Shi*
- 09:40-10:00 **Using Fractional Derivatives for Parameter Identification and Control of Dielectric Elastomer Actuators**  
*Timi Karner, Miloš Žefran, Karl Gotlib*
- 10:00-10:20 **Spatial transformation model and equations of detecting arms of wheel-type robot in cylindrical pipe**  
*Yuanjin Fang, Feng Yang, Zhifeng Dong*
- 10:20-10:40 **Cuspidality Investigation of a Metamorphic Serial Manipulator**  
*Chris Koukos-Papagianis, Vasileios Moulitanitis, Nikos Aspragathos*
- 10:40-11:00 **Gait Transition Between Standing and Falling Down for a Humanoid Robot**  
*Libo Meng, Marco Ceccarelli, Zhangguo Yu, Xuechao Chen, Qiang Huang*
- 11:00-11:30 Coffee

- 11:30-13:30 **Session 2 Robotics**  
*Haitao Liu, Matteo Russo*
- 11:30-11:50 **Experimental set-up for the investigation of transmissions effects on the dynamic performances of a linear PKM**  
*Paolo Righettini, Roberto Strada, Bruno Zappa, Vittorio Lorenzi*
- 11:50-12:10 **Higher- Order Cayley Maps for Minimal Parameterization of Rigid Body Motion**  
*Daniel Condurache*
- 12:10-12:30 **Operation mode analysis of a 4-DOF n-RER parallel manipulator with three operation modes**  
*Xianwen Kong, Yan-An Yao*
- 12:30-12:50 **An approach for faster trajectory planning of pick-and-place parallel robots using velocity capability**  
*Leonardo Meija, Daniel Ponce, Henrique Simas, Daniel Martins*
- 12:50-13:10 **Plane-Parallel Motion of a Friction-Powered Robot Moving Along a Rough Horizontal Plane**  
*Marat Dosaev, Vitaly Samsonov, Andrei Holub*
- 13:10-13:30 **Arm Manipulation Planning of Tethered Tools with the Help of a Tool Balancer**  
*Daniel Sanchez, Weiwei Wan, Kensuke Harada*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Robotics**  
*Victor Glazunov, Oscar Altuzarra*
- 14:30-14:50 **Parameters Analysis of SMA Bimetallic Strip Smart Actuator**  
*Chuanyang Li, Dewei Tang, Hongwei Guo, Huiyin Yan, Weimin Ouyang, Rongqiang Liu, Zongquan Deng*
- 14:50-15:10 **Robotized grinding experiments of construction materials for asbestos removal operation**  
*Quentin Trebot, Da Rosa Aguirre, Harrison, Philippe Vaslin, Jean-Christophe Fauroux, Frédéric Chapelle, Laurent Sabourin*
- 15:10-15:30 **Design and Control of a Tensegrity-Based Robotic**  
*Joint Andres Gonzalez, Ani Luo*
- 15:30-15:50 **TRIFLEX U - Kinematic and Error Analysis of a Self-aligned Translational Parallel Manipulator PRRU**  
*Elias Maletz, Luan Meneghini, Marcel Grando, Daniel Martins, Roberto Simoni, Henrique Simas*

- 15:50-16:10 Mobility Transition Control of a Novel Reconfigurable Mobile Manipulator Torso  
*Jorge De La Cruz, Wan Ding, Mathias Huesing, Burkhard Corves*
- 16:10-16:30 Structural Analysis of Mobile Manipulators  
*Zine Elabidine Chebab, Jean-Christophe Fauroux, Grigore Gogu, Laurent Sabourin, Nicolas Bouton, Youcef Mezouar*

16:30-17:00 Coffee & Poster Sessions

## **Small Hall**

- 09:00-11:00 **Session 1 Multibody dynamics**  
*Krzysztof Tchoń, Agnieszka Ozga*
- 09:00-09:20 **Minimal coordinate multibody dynamics of rolling surfaces using surface joints**  
*Alina Stepken, Francisco Geu Flores*
- 09:20-09:40 **Coupled multibody-fluid dynamic analysis for wave glide**  
*Zongyu Chang, Zhanxia Feng, Xiujun Sun, Chao Deng, Zhongqiang Zheng*
- 09:40-10:00 **Utilization of Non-Conformal Wheel Surfaces for Railway Dynamics**  
*Filipe Marques, Hugo Magalhães, João Pombo, Jorge Ambrósio, Paulo Flores*
- 10:00-10:20 **Structural Analysis and Dynamic Testing of Mini Five-Axis Machine Tools**  
*T.C. Chan, Shang-Hong Wu, You-ze Lin, Jenn-Yih Chen, B. Y. Lee*
- 10:20-10:40 **Assessment of the time-varying load influence on damping abilities of steel beams filled with composite material**  
*Paweł Dunaj, Marcin Chodźko, Tomasz Okulik, Stefan Berczyński, Bartosz Powałka*
- 10:40-11:00 **Shaking Moment Balancing of a Four-Bar Mechanism Using Actuation Redundancy**  
*Mario Acevedo, Teresa Orvañanos, Ramiro Velázquez*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Tribology**  
*Dae-eun Kim, Andrei Grigoriev*
- 11:30-11:50 **Experimental aspects of a cam-follower contact**  
*Giovanni Pugliese, Enrico Ciulli, Francesco Fazzolari*
- 11:50-12:10 **Towards the intelligent analysis of ferrograph images**  
*Jingqiu Wang, Xinliang Liu, Ming Wu, Lianjun Wang, Xiaolei Wang*



- 12:10-12:30 **Static and dynamic behaviors of a cylindrical hydrodynamic journal bearing operating at very low Sommerfeld numbers**  
*Phuoc Vinh Dang, Steven Chatterton, Paolo Pennacchi*
- 12:30-12:50 **A method for improving the capability of convergence of numerical lubrication simulation by using the PID controller**  
*Yuechang Wang, Ying Liu, Yuming Wang*
- 12:50-13:10 **In vitro 3D Wear Characterization of Knee Joint Prostheses**  
*Maria Cristina Valigi, Silvia Logozzo, Saverio Affatato*
- 13:10-13:30 **Investigation of instabilities in mechanical face seals: prediction of critical speed values**  
*Silvia Logozzo, Maria Cristina Valigi*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Tribology**  
*Nikolai Myshkin, Steven Chatterton*
- 14:30-14:50 **Zero Air Gap Condition in Aerostatic Flat Bearings**  
*Federico Colombo, Luigi Lentini Terenziano Raparelli, Vladimir Viktorov, Andrea Trivella*
- 14:50-15:10 **Wear properties of nitrogen doped tetrahedral amorphous carbon coating with the SUJ2 Ball**  
*Young-Jun Jang, Jongkuk Kim*
- 15:10-15:30 **The Effect of Using Hollow Cathode on the Tribological Behavior of Plasma Nitrided Layers**  
*Thiago Lamin, Diego Salvaro, Renan Giacomelli, Roberto Binder, Cristiano Binder, Aloisio Klein, Jose Daniel De Mello*
- 15:30-15:50 **Effect of SiC Particulate on Dry Sliding Wear Behav-iour of Al based Forged Metal Matrix Composites**  
*B P Shivakumar, Hanamantraygouda MB, L.Prashanth, Yogesha K B, Siddappa P, Mruthunjaya M*
- 15:50-16:10 **Large-area 400-mm class coating through the massproduction scale of a filtered cathode vacuum arc system**  
*Jong Kuk Kim, Young-Jun Jang, Young Jin Kang, Dohyun Kim*
- 16:10-16:30 **On the static performance of concave aerostatic pads**  
*Federico Colombo, Luigi Lentini, Terenziano Raparelli, Vladimir Viktorov, Andrea Trivella*
- 16:30-17:00 Coffee & Poster Sessions
- 20:00-21:30 **MEETING: TC for Engines and Powertrains**

## **Seminar Room**

- 09:00-11:00 **Session 1 Gearing and transmission**  
*Konstantin Ivanow*
- 09:00-09:20 **Analysis of Symmetry in Epicyclic Gear Trains**  
*Shanmukhasundaram V R, Daseswara Rao Yendluri, Srinivas Prakash Regalla*
- 09:20-09:40 **Dimensional Synthesis of a Dedicated Hybrid Transmission Through Efficiency Optimization of Gear Trains**  
*Marina Baldissera de Souza, Rodrigo de Souza Vieira, Daniel Martins, Luís Paulo Laus*
- 09:40-10:00 **Analysis of printing direction impact on the dimensional accuracy of spur gears**  
*Robert Masovic, Valentina Jagarčec, Daniel Miler, Zoran Domitran, Nenad Bojčetić, Dragan Žeželj*
- 10:00-10:20 **V-belt drive miniaturization using FEM simulation – an approach**  
*Frank Schaefer*
- 10:20-10:40 **Meshing Limit Line of Involute Worm Drive**  
*Yaping Zhao, Shibo Mu, Siwen Liu*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Vibration**  
*Tadeusz Uhl, Kajetan Dziejach*
- 11:30-11:50 **Reinforcement learning for vibration suppression of an unknown system**  
*Ziemowit Dworakowski, Krzysztof Mendrok*
- 11:50-12:10 **Classical flutter study in turbomachinery cascade using boundary element method in incompressible flows**  
*Chandra Shekhar Prasad, Luděk Pešek*
- 12:10-12:30 **Analysis in the time-frequency domain of different depths of a crack located in a change of section of a shaft**  
*Marta Zamorano, María Jesús Gómez, Cristina Castejón, Eduardo Corral*
- 12:30-12:50 **Modelling and Optimization of Passive and Semi-active Suspension of a 3 DOF Seat Platform**  
*Stefan Segla*
- 12:50-13:10 **A general approach for antiresonance assignment in undamped vibrating systems exploiting auxiliary systems**  
*Dario Richiede, Iacopo Tamellini, Alberto Trevisani*

- 13:10-13:30 **The Method of Finding the Optimal Spindle Speed When Milling Flexible Details**  
*Barbara Kowalska, Krzysztof Kaliński*
- 13:30-14:30 Lunch
- 14:30-16:30 **Session 3 Vibration**  
*Jan Kiciński, Romuald Rządkowski*
- 14:30-14:50 **Non-linear dynamic behavior of a Rubber-Layer Roller Bearings (RLRB) isolator**  
*Nicola Menga, Francesco Bottiglione, Giuseppe Carbone*
- 14:50-15:10 **Parametric eigenvalue analysis for flexible multibody systems**  
*Ilaria Palomba, Erich Wehrle, Renato Vidoni, Alessandro Gasparetto*
- 15:10-15:30 **Nonlinear methodology for assessing vibrational dynamics of a single gear pair under different tribological conditions**  
*Renato Brancati, Raffaele Capasso, Vincenzo Niola, Giuseppe Quaremba, Ernesto Rocca, Sergio Savino*
- 15:30-15:50 **A motion magnification application in video-based vibration measurement**  
*Krzysztof Holak*
- 15:50-16:10 **Filtered envelope spectrum using short periodograms for bearing fault identification under variable speed**  
*Edgar F. Sierra-Alonso, Jerome Antoni, German Castellanos-Dominguez*
- 16:10-16:30 **Time-variant system analysis using wavelet-based transmissibility**  
*Kajetan Dziedzic, Wiesław J. Staszewski, Tadeusz Uhl*
- 16:30-17:00 Coffee & Poster Sessions
- 20:00-21:30 **MEETING: TC for Sustainable energy system**  
*Ion Visa*

## Conference Room

- 09:00-11:00 **CableCon "Motion planning and Cable Modeling"**  
*Marc Gouttefarde*
- 09:00-09:20 **Path Planning of a Mobile Cable-Driven Parallel Robot in a Constrained Environment**  
*Tahir Rasheed, Philip Long, David Marquez-Gamez, Stephane Caro*
- 09:20-09:40 **Development of Emergency Strategies for Cable-Driven Parallel Robots after a Cable Break**

*Roland Boumann, Tobias Bruckmann*

09:40-10:00 **A Conditional Stop Capable Trajectory Planner for Cable-Driven Parallel Robots**

*Patrik Lemmen, Robin Heidel, Tobias Bruckmann*

10:00-10:20 **Modeling of Elastic-Flexible Cables with Time-Varying Length for Cable-Driven Parallel Robots**

*Philipp Tempel, Dongwon Lee, Felix Trautwein, Andreas Pott*

10:20-10:40 **Static and dynamic analysis of a 6 DoF totally constrained cable robot with 8 preloaded cables**

*Damien Gueners, Chedli Bouzgarrou, H  l  ne Chanal*

11:00-11:30 Coffee

11:30-13:30 **CableCon "Calibration and Identification"**

*Marco Carricato*

11:30-11:50 **Slackening Effects in 2D Exact Positioning in Cable-Driven Parallel Manipulators**

*Erika Ottaviano, Andrea Arena, Vincenzo Gattulli, Francesco Potenza*

11:50-12:10 **Automatic Self-Calibration of Suspended Under-Actuated Cable-Driven Parallel Robot using Incremental Measurement**

*Edoardo Ida, Jean-Pierre Merlet, Marco Carricato*

12:10-12:30 **Eye-on-Hand Calibration Method for Cable-Driven Parallel Robots**

*Nicolas Tremblay, Kaveh Kamali, Philippe Cardou, Christian Desrosiers, Marc Gouttefarde, Martin J.-D. Otis*

12:30-12:50 **On the automatic calibration of redundantly actuated cable-Driven parallel robots**

*Han Yuan, Yongqing Zhang, Wenfu Xu*

12:50-13:10 **Towards a Precise Cable-Driven Parallel Robot - A Combined Model-Driven and Model-Free Identification of Geometric Robot Parameter**

*Marcus Hamann, Pauline Marie N  sse, David Winter, Christoph Ament*

13:30-14:30 Lunch

14:30-16:30 **CableCon "Application"**

*Tobias Bruckmann*

14:30-14:50 **Stability Analysis of Pose-Based Visual Servoing Control of Cable-Driven Parallel Robots**

*Zane Zake, St  phane Caro, Adolfo Suarez Roos, Fran  ois Chaumette and Nicol   Pedemonte*

- 14:50-15:10 **Design, implementation and long-term running experiences of the cable-Driven parallel robot CaRo printer**  
*Andreas Pott, Alexander Verl, Frederik Wulle, [Philipp Tempel](#)*
- 15:10-15:30 **A Dual Joystick-Trackball Interface for Accurate and Time-Efficient Teleoperation of Cable-Driven Parallel Robots within Large Workspaces**  
*Kwun Wang Ng, Robert Mahony, [Darwin Lau](#)*
- 15:30-15:50 **Active Vibration Damping of a Cable-Driven Parallel Manipulator Using a Multirotor System**  
*Yue Sun, Matthew Newman, Art Zygielbaum, Benjamin Terry, [Benjamin Wankum](#)*
- 15:50-16:10 **Reproduction of Long-Period Ground Motion by Cable Driven Earthquake Simulator Based on Computed Torque Method**  
*[Daisuke Matsuura](#), Taishu Ueki, Yusuke Sugahara, Minoru Yoshida, Yukio Takeda*
- 16:10-16:30 **Cable Con Meeting**
- 16:30-17:00 Coffee & Poster Sessions
- 20:00-21:30 **MEETING: TC for Reliability**  
*Wojciech Zurowski*

## Thursday 4<sup>th</sup> July

### Large Hall A

- 08:00-9:00 *Keynote Speakers: [Cezary Zieliński](#)*  
**General Robotic System Software Design Methodology**
- 09:00-11:00 **Session 1 Robotics**  
*Shaoping Bai, Juan Pablo Barreto*
- 09:00-09:20 **Linear Electromagnetic Actuator with Mechanical Impedance Control for Experimental Investigation of Landing and Transient Contact in Low Gravity**  
*[Piotr Palma](#)*
- 09:20-09:40 **The Prototype of Regolith Sampling Tool Dedicated to Low Gravity Planetary Bodies**  
*[Karol Seweryn](#), Paweł Paśko, Gianfranco Visentin*
- 09:40-10:00 **Rigid finite elements and multibody modeling in analyses of a robot shaped elastic/plastic deformations of a beam**

- Krzysztof Lipinski, Krzysztof Bobrowski, Edmund Wittbrodt*
- 10:00-10:20 **A kinematic model and dynamic simulation of a parallel robotic structure for lower limb rehabilitation**  
*Tucan Paul, Calin Vaida, Giuseppe Carbone, Adrian Pisla, Ferenc Puskas, Bogdan Gherman, Doina Pisla*
- 10:20-10:40 **Redundancy Resolution Schemes for Kinematically Redundant Parallel Manipulators**  
*Maira Da Silva, João Santos*
- 10:40-11:00 **Design of three-finger capturing mechanism using artificial muscles of twisted and coiled polymer**  
*Jun He, Zhenchuan Sun, Feng Gao*
- 11:00-11:30 Coffee
- 11:30-12:50 **Session 2 Robotics**  
*Yukio Takeda, Calin Vaida*
- 11:30-11:50 **Estimation and Assessment of Upper Limb Movements During Exercises of Children with Musculoskeletal Disorders**  
*Aleksander Pałkowski, Grzegorz Redlarski*
- 11:50-12:10 **Stiffness Modeling and Analysis of a 3-DOF Parallel Kinematic Machine**  
*Yanqin Zhao, Chensheng Wang, Wentie Niu, Zhaobo Mei*
- 12:10-12:30 **Kinematic Analysis of A 6-DOF Robotic Arm**  
*Minh Tuan Nguyen, Cadmus Yuan, Jin H Huang*
- 12:30-12:50 **Kinematic Performance Comparison of Two Parallel Kinematic Machines**  
*Chensheng Wang, Yanqin Zhao, Chenglin Dong, Qi Liu, Wentie Niu, Haitao Liu*
- 13:10-13:30 Closing Ceremony
- 13:30-14:30 Lunch

## **Large Hall B**

- 09:00-11:00 **Session 1 Multibody dynamics**  
*Karol Seweryn, Paweł Zdziebko*
- 09:00-09:20 **Extended Model of Automatic Balancer for Washing Machine**  
*Tadeusz Majewski, Gale Ahearn*
- 09:20-09:40 **Stable internal dynamics of a legged hopping model with locomotion speed control**  
*Ambrus Zelej, Laszlo Bencsik, Tamas Insperger, Gabor Stepan*

- 09:40-10:00 **An extended Craig-Bampton method for the modal analysis of mechanisms**  
*Alessandro Cammarata, Rosario Sinatra, Pietro Davide Maddio*
- 10:00-10:20 **Analysis of Planar Bistable and Snap-through Arches for Contact and Dynamic Loads**  
*Priyabrata Maharana, Jyoti Sonawane, Pavan Belehalli, G.K. Ananthasuresh*
- 11:00-11:30 Coffee

## **Medium Hall A**

- 09:00-11:00 **Session 1 Rotor dynamics**  
*Jan Kicinski, Jaroslav Zapomel*
- 09:00-09:20 **Torsional Friction-Induced Vibrations in Slender Rotating Structures**  
*Ingrid Pires, Bruno Cayres, Djenane Pamplona, Hans Weber*
- 09:20-09:40 **Analysis of Rotor Dynamic for 1 MW Steam Turbine**  
*Romuald Rzgdkowski, Leszek Kubitz, Michał Maziarz*
- 09:40-10:00 **Investigation of Sub-Synchronous Noise & Vibration on Turbocharger Fully Floating Hydrodynamic Bearings – Test & Prediction**  
*Lokesh Chandrasekaran, Praveenkumar S, Prasanth R Vengala, Subramani D A*
- 11:00-11:30 Coffee

- 11:30-12:30 **Session 2 Linkage and mechanical control**  
*Gökhan Kiper, Mónica Urizar*
- 11:30-11:50 **Conceptual Design of a Two-Stage Variable Gravity Compensated Mechanism**  
*Win-Bin Shieh, Ching-Kong Chen*
- 11:50-12:10 **Mechanism Design of a Standing-up Assistance Chair based on Practical Human Motion**  
*Sheng Hao Yin, Yun-Ting Liao, Eiichiro Tanaka*
- 12:10-12:30 **Inflection Circle Based Approach to synthesis of Approximate Straight Line Mechanisms**  
*Prashant Shiwalkar, Swati Moghe, Jyoti Shiwalkar, Jayant Modak*
- 13:30-14:30 Lunch

## **Medium Hall B**

- 09:00-11:00 **Session 1 Tribology**  
*Noritsugu Umehara, Hae-Jin Kim*

- 09:00-09:20 **Analytical Model for the Estimation of Axial Stiffness and Contact Results in Wire Race Ball Bearings**  
*Inigo Martin, Iker Heras, Josu Aguirrebeitia, Mikel Abasolo, Ibai Coria*
- 09:20-09:40 **Effect of defects on tribological behavior in ta-C coating deposited by filtered cathodic vacuum arc technique**  
*Woo-Young Lee, Young-Jun Jang, Takayuki Tokoroyama, Motoyuki Murashima, Noritsugu Umehara*
- 09:40-10:00 **Externally pressurized gas journal bearing with slot restrictors arranged in the axial direction (Experimental Verification of Bearing Stiffness using Large Unbalanced Rotor)**  
*Tomohiko Ise, Kohei Nagao, Masami Matsubara, Shozo Kawamura, Tomoya Kinugawa, Shinya Kikutani, Masaya Kurokawa*
- 10:00-10:20 **Open Form Pressure Balancing for Compliant Hydrostatic Thrust Bearings**  
*Joep Nijssen, Ron van Ostayen*
- 10:20-10:40 **On Necessary and Sufficient Conditions for Wedging in Two Contact Node System**  
*Sanqkyu Kim, Yong Hoon Jang*
- 11:00-11:30 Coffee
- 11:30-12:30 **Session 2 Reliability**  
*Irina Demijanushko, Wojciech Żurowski*
- 11:30-11:50 **Improvements on Design and Validation of Automotive Steel Wheels**  
*Elvio Bonisoli, Carlo Rosso, Simone Venturini, Davide Rovarino, Mauro Velardocchia*
- 11:50-12:10 **Applications FEM analysis in researches reliability and dynamics of road safety barriers at collisions with cars**  
*Irina Demijanushko, Ilya Karpov, Beka tavshavadze*
- 12:10-12:30 **Optimal preventive maintenance interval for a Crankshaft balancing machine under reliability constraint using Bonobo Optimizer**  
*Amit Kumar Das, Dilip Kumar Pratihar*

13:30-14:30 Lunch

## **Small Hall**

- 09:00-11:00 **Session 1 Vibration**  
*Marek Galewski, Ziemowit Dworakowski*



- 09:00-09:20 **Vibration peculiarities of the impacting variable cross section cantilever structure**  
*Vytautas Ostasevicius, Rimantas Didziokas, Rimvydas Gaidys, Vytautas Brazdaitis*
- 09:20-09:40 **Application of qualitative and quantitative methods of analysis in designing research into the vibrations of an oscillator forced by a random series of impulses**  
*Agnieszka Ozga*
- 09:40-10:00 **Vibration signal prediction model for the miniature transducer using deep learning network**  
*Yen-Ta Chiang, Yu Ting Tsai*
- 10:00-10:20 **Stochastic oscillations of a solid body with a kinematic system of vibration isolation**  
*Kuatbay Bissembayev, Assetkhan Smanov*
- 10:20-10:40 **Assessment of Dynamic Young's Modulus and Damping Ratio of Bamboo Fiber Reinforced Polymer Composites using Shock Wave**  
*Kengo Yamamoto, Akito Takasaki, Naoki Hosoya*
- 10:40-11:00 **Analysis of the effect of different friction models on the dynamic response of a rotor rubbing the housing**  
*Juan Carlos Jauregui-Correa, Sthephanie Camacho, Juan Jauregui*
- 11:00-11:30 Coffee
- 11:30-13:30 **Session 2 Engines and powertrains**  
*Tigran Parikyan, José Ramon Serrano*
- 11:30-11:50 **Effect of modification in flow distributor valve geometry on the pressure drop and chamber pressures in ORBIT Motors**  
*Debanshu Roy, Amit Kumar, Rathindranath Maiti, Prasanta Kumar Das*
- 11:50-12:10 **An experimental methodology and model to characterize from diathermal perspective radial centrifugal compressors of turbocharged engines**  
*Alberto Broatch, Jose Ramon Serrano, Pablo Olmeda, Alejandro Gomez-Vilanova*
- 12:10-12:30 **Design Analysis Tasks in Simulation of Engine and Powertrain Dynamics: An Overview**  
*Tigran Parikyan*
- 13:30-14:30 Lunch

**Seminar Room**

09:00-11:00 **EC Meeting**

11:00-11:30 Coffee

11:30-13:10 **EC Meeting**

13:30-14:30 Lunch

## **Conference Room**

09:00-11:00 **Session 1 Robotics**

*Raffaele Di Gregorio, Sébastien Briot*

09:00-09:20 **Automatic Mobility Analysis of Parallel Mechanisms Based on Position and Orientation Characteristic Equation. Part II : Mobility analysis and Examples**

*Xiaorong Zhu, Huiping Shen, Chengqi Wu, Ting-li Yang*

09:20-09:40 **A Framework for Robotic Bin Packing with a Dual-Arm Configuration**

*Ching-Yen Weng, Wanqi Yin, Zhong Jin Lim, I-Ming Chen*

09:40-10:00 **A Novel 3 DOFs Waist Mechanism for Humanoid Robots: Kinematic Analysis and Motion Simulation**

*Marko Penčić, Maja Čavić, Boris Brkić, Milan Rackov*

10:00-10:20 **Hybrid AMCL-EKF filtering for SLAM-based pose estimation in rough terrain**

*Andrii Kudriashov, Tomasz Buratowski, Mariusz Giergiel*

10:20-10:40 **Kinematic And Workspace Analysis Of Minimally Routed Cable Driven Open Chains**

*Vishal Ramadoss, Dimiter Zlatanov, Matteo Zoppi*

10:40-11:00 **Dynamic Analysis and Experimental Study of a Floating Cable-Driven Manipulator in Marine Environment**

*Mamon Horoub, Mahir Hassan, Muhammad Hawwa*

11:00-11:30 Coffee

11:30-12:30 **Session 2 Micromechanism**

*Gondi Kondaiah Ananthasuresh*

11:30-11:50 **A new kind of Multi-Notched Flexure Hinges Based 3-RRR Micro-Positioning Stage**

*Antai Zhou, Xianmin Zhang, Min Liu*

11:50-12:10 **Modelling of an Initially-retracting Electrothermal Microactuator**

*Dhananjay Yadav, G. K. Ananthasuresh*

12:10-12:30 **Design of a Motion Energy Harvester based on Compliant Mechanisms: a Bi-stable Frequency Up-converter Generator.**

*Thijs Blad, Davood Farhadi Machekposhti, Just Herder, Nima Tolou*

13:30-14:30 Lunch