EUCOMES 2016 – 6th European Conference on Mechanism Science

20 – 23 September 2016, IRCCyN, Nantes, France

Final Programme
Tuesday, September 20

10:00 – 10:45 Welcome coffee and registration

10:45 – 11:00 Opening Chair: Philippe Wenger

11:00 – 12:20 Mechanics of robots 1 Chair: Vigen Arakelyan

11:00 – 11:20 Calculation of the ball raceway interferences due to manufacturing errors and their influence on the friction moment in four-contact-point slewing bearings
Iker Heras, Josu Aguirrebeitia and Mikel Abasolo

11:20 – 11:40 Meshing Analysis for TA Worm Drive
Yaping Zhao

11:40 – 12:00 Trade-Off for Space Mechanisms Actuator Technology via a General Purpose Language and Domain Specific Simulations Framework
Manolo Omiciuolo, Kristin Paetzold, Matthias Baader, Markus Thiels and Klaus Peter Foerster

12:00 – 12:20 Tolerance Analysis of Serial Manipulators with Decoupled and Non-decoupled Dynamics
Jiali Xu, Jean-Paul Le Baron and Vigen Arakelian

12:20 – 14:00 Lunch (Brasserie Les Facultés)

14:00 – 15:40 Mechanism Analysis 1 Chair: Manfred Husty

14:00 – 14:20 Mobility analysis of coupler-driven planar four-bar linkages
Shaoping Bai

14:20 – 14:40 On the dynamic equivalence of planar mechanisms, an inertia decomposition method
Jan De Jong, Johannes Van Dijk and Just Herder

14:40 – 15:00 Determination of a Rigid Body Orientation by Means of Indirect Measurements
Irina Gavrilovich, Sébastien Krut, Marc Gouttefarde and François Pierrot

15:00 – 15:20 Algebraic Analysis of a New Variable-DOF 7R Mechanism
Martin Pfurner and Xianwen Kong

15:20 – 15:40 Overconstrained Single Loop Four Link Mechanisms with Revolute and Prismatic Joints
Martin Pfurner, Thomas Stigger and Manfred L. Husty
Coffee Break

16:00 – 17:40 Parallel manipulators 1 Chair: Jean-Pierre Merlet

16:00 – 16:20 Planar Stewart Gough platforms with quadratic singularity surface
Bernd Aigner and Georg Nawratil

16:20 – 16:40 Forward Kinematic Analysis of the 3-RPRS Parallel Manipulator
Anirban Nag, Santhakumar Mohan and Sandipan Bandyopadhyay

16:40 – 17:00 Computing the safe working zone of a 3-RRS parallel manipulator
Dhruvesh Patel, Rohit Kalla, Sandipan Bandyopadhyay and Gökhan Kiper

17:00 – 17:20 Comparison of 3-RPS and 3-SPR Parallel Manipulators based on Kinematic Performance
Abhilash Nayak, Latifah Nurahmi, Philippe Wenger and Stéphane Caro

17:20 – 17:40 On the workspace representation and determination of spherical parallel robotic manipulators
Khaled Arrouk, Belhassen-Chedli Bouzgarrou and Grigore Gogu

19:00 – 22:00 Welcome party and dinner

Meeting point: Entry of Passage Pommeraye, rue Santeuil (City Center)
Wednesday, September 21

9:00 – 10:20  **Tensegrity mechanisms**  *Chair: Damien Chablat*

9:00 – 9:20  *Compliant Multistable Tensegrity Structures with Simple Topologies*  
Valter Böhm, Susanne Sumi, Tobias Kaufhold and Klaus Zimmermann

9:20 – 9:40  *Compliant Gripper Based on a Multistable Tensegrity Structure*  
Susanne Sumi, Valter Böhm, Florian Schale and Klaus Zimmermann

9:40 – 10:00  *Toward the control of tensegrity mechanisms for variable stiffness applications: a case study*  
Quentin Boehler, Salih Abdelaziz, Marc Vedrines, Philippe Poignet and Pierre Renaud

10:00 – 10:20  *Kinematic Analysis of a Continuum Parallel Robot*  
Oscar Altuzarra, Mikel Diez, Javier Corral, Gennaro Teoli and Marco Ceccarelli

**Coffee Break**

10:40 – 12:20  **Mechanics of robots 2**  *Chair: Paulo Flores*

10:40 – 11:00  *A New Formulation for Spatial Revolute Joints with Clearance*  
Filipe Marques, Fernando Isaac, Nuno Dourado and Paulo Flores

11:00 – 11:20  *Efficiency Assessment in Spur Gears with Shifting and Profile Modifications*  
Alberto Diez-Ibarbia, Alfonso Fernandez-Del-Rincon, Miguel Iglesias, Ana De-Juan, Pablo Garcia and Fernando Viadero

11:20 – 11:40  *Motion design considering moment of inertia*  
Sören Schulze, Carsten Teichgräber and Maik Berger

11:40 – 12:00  *Recent Developments on Cylindrical Contact Force Models with Realistic Properties*  
Fernando Isaac, Filipe Marques, Nuno Dourado and Paulo Flores

12:00 – 12:20  *On the Determination of the Meshing Stiffness and the Load Sharing of Spur Gears*  
José I. Pedrero, Miguel Pleguezuelos and Miryam B. Sánchez

12:20 – 14:00  **Lunch (“Le temps d’une Fouée”, IRCCyN, S building)**
14:00 – 15:40 Industrial and non-industrial applications 1 Chair: Anatol Pashkevich

14:00 – 14:20 WinMecC: Software for the Analysis and Synthesis of Planar Mechanisms
Alex Bataller, Antonio Ortiz, Juan Antonio Cabrera and Fernando Nadal

14:20 – 14:40 Manipulator Motion Planning in Redundant Robotic System for Fiber Placement Process
Jiuchun Gao, Anatol Pashkevich and Stéphane Caro

14:40 – 15:00 Free and Open Source Software Applications for Education of TMM Discipline in Bauman University
Andrei Vukolov

15:00 – 15:20 A Novel One-DoF Gravity Balancer Based on Cardan Gear Mechanism
Yu-Chun Hung and Chin-Hsing Kuo

15:20 – 15:40 Galvanometer laser scanning: Custom-made input signals for maximum duty cycles in high-end imaging applications
Virgil-Florin Duma

Coffee Break

16:00 – 17:00 Control issues Chair: Georges Levey

16:00 – 16:20 Optimal Motion of Flexible Objects with Oscillations Elimination at the Stop Point
Natalia Varminska and Damien Chablat

16:20 – 16:40 Alternating Error Effects on Decomposition Method in Function Generation Synthesis
Omar W Maaroof, Mehmet İsmet Can Dede and Gökhan Kiper

16:40 – 17:00 Control-based Design of a Five-bar Mechanism
Lila Kaci, Sébastien Briot, Clément Boudaud and Philippe Martinet

17:00 – 17:40 History of mechanisms Chair: Georges Levey

17:00 – 17:20 F. Reuleaux, F. Wittenbauer: their Influence on Evolution of Applied Mechanics in Russia at the Beginnings of XXth century
Andrei Vukolov

17:20 – 17:40 Applying Modern CAD Systems to Reconstruction of Old Design
Gennadiy Timofeev, Olga Egorova and Ilya Grigorev

18:30 – 19:30 Reception at Hotel de Ville (Meeting point: Nantes City Hall, rue de la Commune)

20:00 – 21:30 Meeting of the Eucomes Steering Committee
Thursday, September 22

9:00 – 10:20  Cable mechanisms  Chair: Stéphane Caro

9:00 – 9:20  Increase of Position Accuracy for Cable-Driven Parallel Robots using a Model for Elongation of Plastic Fiber Ropes
Valentin Schmidt and Andreas Pott

9:20 – 9:40  Pose-Independent Counterweighting of Cable-Suspended Payloads with Application to Rehabilitation
Carl Nelson, Raphaël Thienpont and Ashish Shinde

9:40 – 10:00  Preliminaries of a new approach for the direct kinematics of suspended cable-driven parallel robot with deformable cables
Jean-Pierre Merlet

10:00 – 10:20  Static Analysis of Planar 3-DOF Cable-Suspended Parallel Robots Carrying a Serial Manipulator
Marc Gouttefarde

Coffee Break

10:40 – 12:00  Mechanism design and synthesis 1  Chair: Mathias Hüsing

10:40 – 11:00  Structural synthesis, Mobility Analysis and Creation of Complete Atlas of Multiloop Planar Multiple-jointed Kinematic Chains on Base All Possible Sets of Color Multiple Joints for Industrial Applications
Ekaterina Ermoshina and Vladimir Pozhbelko

11:00 – 11:20  Design and Development of a Triggered Type Underactuated Grasping Mechanism and its Application to an Experimental Test Bed
Steven Grech and Michael Saliba

11:20 – 11:40  Solving the minimum distance problem for the synthesis of mechanisms
Igor Fernandez de Bustos, Vaness García Marina and Gorka Urkullu

11:40 – 12:00  Mobile Robot with Multiple Modes Based on 4-URU Parallel Mechanism
Zhihuai Miao, Jieyu Wang and Bing Li

12:00 – 13:40 Lunch (Brasserie Les Facultés)
13:40 – 15:00  Mechanisms for biomechanics and surgery Chair: Doina Pisla

13:40 – 14:00 An experimental characterization of human knee joint motion capabilities
Michał Olinski, Marco Ceccarelli, Daniele Cafolla and Antoni Gronowicz

14:00 – 14:20 An Innovative Parallel Robotic System for Transperineal Prostate Biopsy
Bogdan Gherman, Nicolae Plitea and Doina Pisla

14:20 – 14:40 A 2PRP-2PPR planar parallel Manipulator for the purpose of Lower Limb Rehabilitation
Jayant Mohanta and Santhakumar Mohan

14:40 – 15:00 Singularity Analysis of a Wall-mounted Parallel Robot with SCARA MotionsLower Limb Exoskeleton with Hybrid Pneumatically Assisted Electric Drive for Neurorehabilitation
Anton Aliseychik, Elena Kolesnichenko, Victor Glazunov, Igor Orlov, Vladimir Pavlovsky and Natalia Petrovskaya

Coffee Break

15:20 – 16:20  Mechanism design and synthesis 2 Chair: Carl Nelson

15:20 – 15:40 An Adjustable Constant Force Mechanism Using Pin Joints and Springs
Patrice Lambert and Just L. Herder

15:40 – 16:00 Synthesis and optimisation of large stroke flexure hinges
Martijn Grootens, Ronald Aarts and Dannis Brouwer

16:00 – 16:20 On the grand 4R four-bar based inherently balanced linkage architecture
Volkert van der Wijk

16:30 – 18:00 Visit of the robotics lab – Meeting of TC Comp. Kinematics

18:30 Departure to Château de Goulaine (meeting point: IRCCyN)

19:00 – 23:00 Welcome Apéritif at Castle’s Lu Museum – Conference dinner – Best paper awards ceremony
Friday, September 23

9:00 – 10:20 Mechanism Analysis 2 Chair: Martin Pfurner

9:00 – 9:20 A Workspace Analysis of 4R Manipulators Via Level-Set Formulation
Matteo Russo and Marco Ceccarelli

9:20 – 9:40 A constructive method for the approximation of the multiple inverse kinematics solutions of noncuspidal 6 DoF manipulators
Vassilis Moulianitis, Dimitrios Vogiatzief and Nikos Aspragathos

9:40 – 10:00 Single-loop Foldable 8R Mechanisms with Multiple Modes
Jieyu Wang, Guochao Bai and Xianwen Kong

10:00 – 10:20 Calibration of TCP-fixed bevel units
Carsten Teichgräber, Maik Berger and Jörg Müglitz

Coffee Break

10:40 – 12:20 Industrial and non-industrial applications 2 Chair: Philippe Cardou

10:40 – 11:00 Mechanism Type Synthesis Approach for Automated Handling and Multiaxial Draping of Reinforcing Textiles
Jan Brinker, Jascha Paris, Mario Müller, Mathias Hüsing and Burkhard Corves

11:00 – 11:20 Design of a Reciprocal Hip Mechanism with Adjustable Flexion-Extension Coupling Ratios for Prosthetic Applications
Kuan-Han Chen and Jyh-Jone Lee

11:20 – 11:40 Wind turbine based on antiparallel link mechanism
Marat Dosaev, Lyubov Klimina and Yury Selyutskiy

11:40 – 12:00 Model and analysis of a novel piezo-electric rotational motor based on deformation wave precession
Marco Leonesio, Nicola Cau, Giacomo Bianchi and Paolo Bonfiglio

12:00 – 12:20 Estimating characteristics of a contact between sensing element of medical robot and soft tissue
Anastasya Yakovenko, Irina Goryacheva and Marat Dosaev

12:20 – 14:00 Lunch
14:00 – 15:40  Parallel manipulators 2  Chair: Sébastien Briot

14:00 – 14:20  
A coordinate-free dynamical model for cable-driven parallel robots
Georges Le Vey

14:20 – 14:40  
Path Generation Synthesis of Planar Double-Slider Linkages via the Elliptic Coupler Curve
Gökhan Kiper, Almina Akbalçık and Zehra Betül Şen

14:40 – 15:00  
A Controller for Avoiding Dynamic Model Degeneracy of Parallel Robots during Type 2 Singularity Crossing
Damien Six, Sébastien Briot, Abdelhamid Chriette and Philippe Martinet

15:00 – 15:20  
Singularity Analysis of a Wall-mounted Parallel Robot with SCARA Motions
Guanglei Wu and Shaoping Bai

15:20 – 15:40  
Design of a Cable-Driven Four-Bar Mechanism for Arm Rehabilitation
Talha Eraz and Gökhan Kiper

15:40 – 16:00  Closing address and farewell coffee  Chair: Philippe Wenger

The venue of EUCOMES’2018 will be announced during the closing address!