



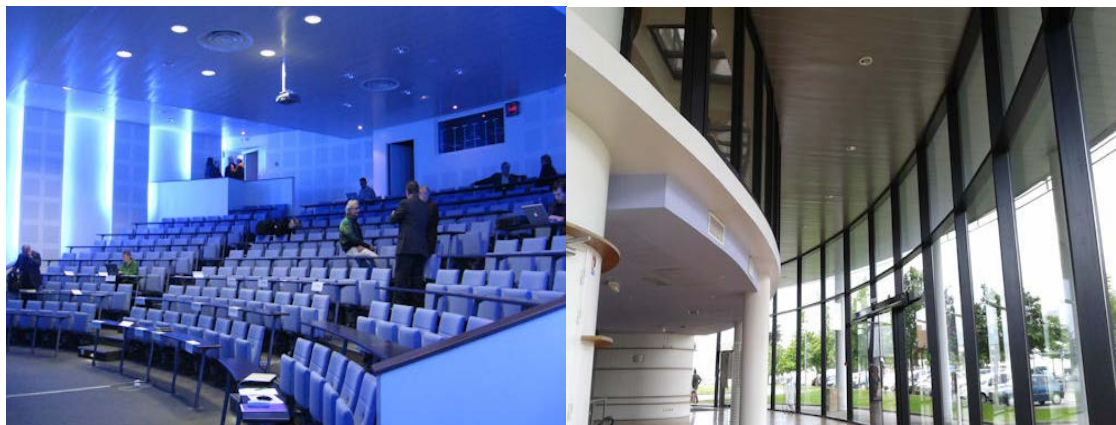
# EUCOMES 2016 – 6<sup>th</sup> European Conference on Mechanism Science

20 – 23 September 2016, IRCCyN, Nantes, France



*Institut de Recherche en Communications  
et Cybernétique de Nantes  
UMR CNRS 6597*

## 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 Pfulner and Xianwen Kong

15:20 – 15:40 *Overconstrained Single Loop Four Link Mechanisms with Revolute and Prismatic Joints*

Martin Pfulner, 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 Maarooof, 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 Motions Lower 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!**

