6th International Symposium on Multibody Systems and Mechatronics

October 24-28, 2017 - Florianópolis - Brazil

Scientific Program

October 24

09:00 – 11:00	**Registration**
11:00 – 12:30	**Oppening Session** Roberto Simoni, Daniel Martins, Mario Acevedo, João Carlos Mendes Carvalho, Herique Simas *Welcome to the MuSME Floripa* Daniel Martins - UFSC *Keynote Speaker:* Jingshan Zhao - China
12:30 – 14:00	***Lunch***
14:00 – 15:30	**Session 1: Synthesis of Mechanisms and Robots** **Chair: Martín Pucheta** **Synthesis of precision flexible mechanisms using screw theory with a finite elements validation** Martín Pucheta, Alejandro Gallardo **Enumeration of kinematic chains with zero variety for epicyclic gear trains with one and two degrees of freedom** Marina Baldissera de Souza, Rodrigo de Souza Vieira, Daniel Martins **Mechanism Design and Kinematics Analysis of a Bat Robot** Deming Kong, Jingshan Zhao **Vector Analysis of the Cable Tension Conditions** Thaís Muraro, Daniel Martins, Leonardo Sacht

15:30 – 16:00	***Coffee Break***
16:00 – 17:30	**Session 2: Synthesis of Mechanisms and Robots** **Chair: Estevan Hideki Murai** **Actuated degree-of-control: a new approach for mechanisms design** Estevan Hideki Murai, Roberto Simoni, Daniel Martins **Analysis of self-aligning mechanisms by means of matroid theory** Andrea Piga Carboni, Henrique Simas, Daniel Martins **Review and classification of workpiece toggle clamping devices** Mateus Viana de Oliveira Costa, Estevan Hideki Murai, Fabíola Rosa, Daniel Martins **Behaviour comparison between mechanical epicyclic gears and magnetic gears** Melaine Desvaux, Bernard Multon, Hamid Ben Ahmed, Stéphane Sire
19:00	Bus departure to the Welcome Dinner
19:30 – 22:30	***Dinner***
22:30	Bus return to UFSC

October 25

09:00 – 09:30	*Keynote Speaker:* Martín Pucheta - Argentina
09:30 – 10:30	**Session 3: Kinematic Analysis** **Chair: Henrique Simas** **Kinematic Analysis for a Planar Redundant Serial Manipulator** Zijia Li, Mathias Brandstötter, Michael Hofbaur **Workspace Analysis of a Parallel Manipulator Using Multi-Objective Optimization and Bio-Inspired Methods** Rogério Sales Gonçalves, Joao Carvalho, Fran Sergio Lobato **Modeling of a four-legged robot with variable center of mass as a cooperative multirobot system** Cristiane Tonetto, Antônio Bento Filho, Altamir Dias **Assembly sequence planning for shape heterogeneous modular robot systems** Anelize Zomkowski Salvi, Roberto Simoni, Henrique Simas

10:30 – 11:00	***Coffee Break***
11:00 – 12:30	**Session 4: Static Analysis** **Chair: Leonardo Mejia Rincon** **Kinetostatics and Optimal Design of a 2PRPU Shoenflies-Motion Generator** Henrique Simas, Raffaele Di Gregorio **Influence of the working mode on the maximum isotropic force capability maps for a 3RRR planar parallel manipulator** Leonardo Mejia Rincon, Daniel Ponce, Juan Camilo Herrera Pineda, Henrique Simas, Daniel Martins **Maximum isotropic force capability maps in planar cooperative systems: A practical study case** Juan Camilo Herrera Pineda, Leonardo Mejia Rincon, Roberto Simoni, Henrique Simas **Balancing conditions of the RSS'P spatial mechanism An alternative method using Natural Coordinates** Mario Acevedo
12:30 – 14:00	***Lunch***
14:00 – 15:30	**Session 5: Dynamic Analysis** **Chair: Julio Frantz** **Elastodynamic Performance of a Planar Parallel Mechanism under Uncertainties** Fabian Andres Lara-Molina, Edson Hideki Koroishi, Thamiris Costa **Complex modelling and dynamical analysis of parallel cable mechanisms** Radek Bulín, Michal Hajžman, Pavel Polach **A new methodology for the balancing of mechanisms using the Davies' method** Julio Frantz, Leonardo Mejia Rincon, Henrique Simas, Daniel Martins **The Dynamic Synthesis of an Energy-Efficient Watt-II-Mechanism** Ferdinand Schwarzfischer, Mathias Hüsing, Burkhard Corves **Multibody dynamic analysis of a High-Altitude Long-Endurance aircraft concept** Luciano Nitardi, Bruno Roccia, Sergio Preidikman, Fernando Flores
15:30 – 16:00	***Coffee Break***
16:00 – 17:30	**Session 6: Control of Mechatronic Systems** **Chair: Pavel Polach**

	High-Order Sliding Mode Control for Solar Tracker Manipulator Irandi Gutiérrez, Eusebio Eduardo Hernández Martínez, Armando Oropeza, Sajjad Keshtkar **Towards a Servovision based Control of a Planar Parallel Manipulator** Fernanda Colombo, Maíra da Silva **Multibody Model of the VVER 1000 Nuclear Reactor Control Assembly and Simulation of Its Moving Parts Drop** Pavel Polach, Michal Hajžman **Single-state friction model for control purposes** Fernando Villegas, Rogelio Hecker, Gustavo Flores **Design and Optimal Control of a Robotic Speech-to-Sign Language Transliterating System** Maykol Jiampiers Campos Trinidad, Erwin Daniel López Zapata, Renzo Sebastián Salazar Arévalo, Juan José Acostupa del Carpio

October 26

09:00 – 09:30	*Keynote Speaker:* Glauco Caurin - USP
09:30 – 10:30	**Session 7: Modelling and Simulation** **Chair: Tiago Pinto** **Robust Critical Inverse Condition Number for a 3RRR Robot Using Failure** Hiparco Lins Vieira, João Fontes, Maíra da Silva, Andre Teofilo Beck **Simulation of a Serial Robot Calibration through Screw Theory** Lucas Kato, Tiago Pinto, Henrique Simas, Daniel Martins **Comparative study of autonomous aerial navigation methods oriented to environmental monitoring** Jorge Roberto López Cáceres, Manasses Antoni Mauricio Condori, Luis Alvaro Rojas Machado, Erwin Dianderas, Juan Pablo Vargas Machuca Bueno, Ricardo Raul Rodriguez Bustinza
10:30 – 11:00	***Coffee Break***
11:00 – 12:30	**Session 8: Modelling and Simulation** **Chair: Glauco Caurin** **Simulation and experimental verification of a global redundancy resolution for a 3PRRR prototype** João Fontes, Maíra da Silva

	A computational aeroelastic framework for studying non-conventional aeronautical systems Sergio Preidikman, Bruno Roccia, Marcos Verstraete, Luis Ceballos, Balakumar Balachandran **ILQG Planner Applied to Dynamic Systems with Intermittent Contact** Henrique Garcia, Leonardo Luna, Gustavo Jose Giardini Lahr, Glauco Caurin **Cost Effective Provisioning of Electricity in Smart Nano-Grid Using GA and Optimized Heuristic** Nabila Ahmad
12:30 – 14:00	***Lunch***
14:00 – 15:30	**Session 9: Prototypes and Experimental Validations** **Chair: Antonio Carlos Valdiero** **Mathematical Modeling and Prototype Development of a Pneumatically Actuated Bench for Sloping Terrain Simulation** Marcia Regina Maboni Porsch, Nivia Maria Kinalski, Roberta Goergen, Andrei Fiegenbaum, Luiz Antônio Rasia, Antonio Carlos Valdiero **An experimental characterization of roll hemming process** José Eduardo Esquivel González, Giuseppe Carbone, Marco Ceccarelli, JUAN CARLOS JAUREGUI **Experimental Characterization of a Feedforward Control for the Replication of Moving Resistances on a Chassis Dynamometer** Elvis Bertoti, Jony Eckert, Rodrigo Yamashita, Ludmila Silva, Franco Giuseppe Dedini **Experimental Setup of a Novel Four DOF Parallel Manipulator** Marina Vallés, Pedro Araujo-Gómez, Vicente Mata, Angel Valera, Miguel Díaz-Rodríguez, Alvaro Page, Nidal Farhat **Supporting the laminated ferromagnetic pole pieces in a magnetic gear: A structure behaviour analysis from a multibody model** Melaine Desvaux, Bernard Multon, Hamid Ben Ahmed, Stéphane Sire
15:30 – 16:00	***Coffee Break***
16:00 – 17:30	**Session 10: Mechatronic Systems for Assistive Technology** **Chair: Doina Pisla** **Design Optimization of a Cable-driven Parallel Robot in Upper Arm Training-Rehabilitation Processes** Eusebio Eduardo Hernández Martínez, S. Ivvan Valdez, Giuseppe Carbone, Marco Ceccarelli **Kinematic analysis of an exoskeleton-based robot for elbow and wrist rehabilitation** Nicolae Plitea, Bogdan Gherman, Giuseppe Carbone, Marco Ceccarelli, Calin Vaida, Alexandru Banica, Doina Pisla, Adrian Pisla **Experimental Evaluation of Artificial Human Ribs** Luis Antonio Aguilar, Marco Ceccarelli, Christopher-René Torres-San-Miguel, Guillermo Urriolagoitia-Sosa, Guillermo Urriolagoitia-

	Calderón **An Initial Assessment of Mechanisms for the Development of New Hospital Beds** Rodrigo Barreto, Roberto Simoni, Daniel Martins

October 27

09:00 – 09:30	*Keynote Speaker:* Mario Acevedo - Mexico
09:30 – 10:30	**Session 11: Mechatronic Systems for Assistive Technology** **Chair: Daniel Ponce** **Kinetostatic model of the human knee for preoperative planning: Part A Method and Validation** Daniel Ponce, Leonardo Mejia Rincon, Ernesto Ponce, Daniel Martins, Rodrigo Roesler, Julio Feller Golin **Kinetostatic model of the human knee for preoperative planning: Part B Clinical application for medical decision making** Daniel Ponce, Julio Feller Golin, Ernesto Ponce, Rodrigo Roesler, Daniel Martins, Leonardo Mejia Rincon **On the Kinematics of an Innovative Spherical Parallel Robot for the Shoulder Rehabilitation** Nicolae Plitea, Calin Vaida, Giuseppe Carbone, Adrian PISLA, Ionut Ulinici, Doina Pisla **Automatic Elevation System of a Wheelchair** Sergio Araki, Pamela Florentino, Eduardo Bock, Miichele Saito, Mariana Hernandes, Luciano Fuentes, Isac Fujita, Rodrigo Stoeterau, Daniel Martins, Celso Arruda
10:30 – 11:00	***Coffee Break***
11:00 – 12:30	**Session 12: Vehicle Dynamics** **Chair: Abel Arrieta Castro** **Multibody model of a small tire test bench** Fabio Mazzariol Santiciolli, Ludmila Silva, Elvis Bertoti, Jony Eckert, Rodrigo Yamashita, Franco Giuseppe Dedini **Rollover of long combination vehicles: effect of overweight** Gonzalo Moreno, Vangelo Manenti, Lauro Nicolazzi, Rodrigo de Souza Vieira, Daniel Martins **Development of a robust integrated control system to improve the stability of road vehicles** Abel Arrieta Castro, Georg Rill, Hans Ingo Weber

12:30 – 14:00	***Lunch***
14:00 – 15:30	**Session 13: Vehicle Dynamics** **Chair: Luis Paulo Laus** **Design and analysis of a wheel with flexible spokes** Shuaisong Hou, Jingshan Zhao **Powertrain Optimization to Improve Vehicle Performance and Fuel Consumption** Jony Eckert, Fernanda Correa, Elvis Bertoti, Rodrigo Yamashita, Ludmila Silva, Franco Giuseppe Dedini **Maneuverability study of a vehicle with rear wheel steering** Jhino Silva, Lincol Vargas, Josue Liberato, Junior Quispe, Carlos Munares
15:30 – 16:00	***Coffee Break***
16:00 – 17:30	**Best Paper Award Ceremony**
17:30 – 18:30	Meeting of the MuSMe Scientific Committee

October 28

09:00	Bus departure to City Tour
12:30 – 14:00	Lunch
16:00	Bus return to UFSC

Institutional Support