

# Final Program



**I F T O M M**

International Federation for the Promotion of Mechanism and Machine Science

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## Thirteenth World Congress in Mechanism and Machine Science



Universidad de Guanajuato

Guanajuato City, México  
June 19–23, 2011

## **From the Organizing Committee Chair**

The International Federation for the Promotion of Mechanism and Machine Science, IFToMM, in existence for over forty years, and with a representation of 48 countries, provides an effective channel for the interaction of those working toward the advancement of basic and applied knowledge in the area. The IFToMM World Congress is an event that takes place every four years. The thirteenth one is held in Guanajuato, Mexico, marking the first time a Latin American country hosts it.

It is significant that the site of the Congress is a campus of the University of Guanajuato, an institution with a strong tradition in Mechanical Engineering. Its generous support for the Thirteenth World Congress has been determinant in the planning and execution of numerous preparations. This support is acknowledged with gratitude by the Local Organizing Committee. Thanks are also due to The Mexican Society of Mechanical Engineering, SOMIM, which lent its expertise to carry out important tasks, such as the handling of the paper review process. The Local Organizing Committee also recognizes the financial support given by the the National Council for Science and Technology of Mexico, CONACyT.

Accepted papers, contained in the Congress proceedings, number 307. Besides the simultaneous sessions covering the areas of IFToMM.s Technical Committees and Permanent Commissions, three keynote plenary lectures are included in the scientific program.

**Prof. Ricardo Chicurel-Uziel**

## **From the Local Organizing Committee**

Welcome congress participants.

It is my great pleasure, on behalf of the University of Guanajuato, to welcome all of you to the 13th IFToMM World Congress in the city of Guanajuato. This is the largest mechanism and machine science conference in the world, and one that is very important to us, as it is our conviction that preparing highly capable professionals and developing advanced technology is key to Mexico achieving world-class standards. During this conference, our city will become a melting pot, where outstanding contributions and in-depth discussions among leaders and researchers from around the world will coalesce into new directions in this discipline.

In Mexico and at our University, we feel strongly about the importance of international collaboration. We are also sure that fruitful collaborations will arise during the conference, and that your presence here will motivate many more students to get involved in the field. Mexico currently faces social, economic and educational development challenges, but we are firmly committed to international competitiveness, and research is fundamental to achieving our goal.

I believe that education is the bedrock of social development. At the University of Guanajuato, our mission revolves around providing our young people with a first-class learning experience. We have moved significantly forward in recent years, doubling enrollment, building new facilities, implementing a multi-campus structure, growing our capacity for research, putting all of our academic programs through external evaluation, and achieving accreditation by the Mexican National Council for Science and Technology of twenty-nine of our graduate programs.

We are deeply grateful to both the International Steering Committee and the local committee for their titanic efforts in organizing the Congress. I thank CONACYT and the Guanajuato State Government for the grants that have made this conference possible.

Finally, besides discussing research and educational issues, I invite all of you to enjoy the city of Guanajuato, a UNESCO world heritage site. I think our city's culture and hospitality will make your stay all the more worthwhile.

Here's to a great conference!

**Prof. Arturo Lara-López**  
**Rector General**  
**Universidad de Guanajuato**

## **From the Government of the State of Guanajuato**

On behalf of the state government and the people of Guanajuato, the state where the Mexican Independence War begun, I welcome all of you to the activities of the 13th World Congress on the Theory of Mechanism and Machine Science. Our state is very proud to be the first host, in all Latin American countries, of this prestigious scientific meeting.

I am confident that the activities that will take place in this congress will be transcendental for the advancement of the many subject fields covered by this event. It is important to let you know that, from the XVI century to this date, Guanajuato has played an important role in the mining industry, in particular silver mining, and since those days, the people of Guanajuato has dealt with the development of new ideas and methods to overcome the difficulties associated with these endeavors.

Now, Guanajuato plays an important role in the automotive and biotechnology industries. I invite all of you to become acquainted with the rich cultural heritage of our state, with many historical landmarks, beautiful landscapes and hospitable population. I am sure that you will come back in the near future to relive your experiences of these coming days.

**Lic. Juan Manuel Oliva Ramírez**  
**Guanajuato State Governor.**

## From the Mayor of Guanajuato City.

June 1st 2011 Guanajuato, Gto.

The Guanajuato of today begins a new era, where society and government cross actions looking to achieve development. The main goal of this **local administration** is to have a better urban display so that our visitors and tourists have pleasant a stay in the land that gave birth to the **National Independence**.

It is an honor for the **City of Guanajuato** to welcome the 13th World Congress in Mechanics and Machine Science, IFToMM 2011. As President of the City and on behalf of the City Council 2009 - 2012 we wish you a very satisfying stay and we hope that this **City Cultural Heritage of the World and Cervantes's Capital of America** will enchant you.

Guanajuato is aware of the industrial development that is taking place in the region. Many world wide enterprises, like General Motors, Volkswagen, VSCT have decided to stay in the State creating new opportunities for the people of this Capital City.

We applaud the effort of the **Universidad Nacional Autónoma de México (UNAM)**, and **Universidad de Guanajuato (UG)**, to promote this Congress in Mechanics and Machine Science that will result in development oppotunities for our scientists, engineers and our population in general.

On behalf of the people of Guanajuato, I hope you have a productive and delightful stay. We look forward to seeing you again in the near future.

Sincerely,

**Lic. Nicéforo Guerrero**  
**Mayor of Guanajuato City.**

## IFTToMM Living Honorary Members

Prof. Jorge Angeles (Canada)  
Prof. Arkady Bessonov (Russia)  
Prof. Erskine Crossley (USA)  
Prof. Teru Hayashi (Japan)  
Prof. Leonard Maunder (UK)  
Prof. Emilio Bautista Paz (Spain)  
Prof. Bernard Roth (USA)  
Prof. Ales Tondl (Czech Republic)

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## General Assembly Constitution Commission

Prof. Krzysztof KEDZIOR (Chair)

## General Assembly Nominating Commission

Kenneth WALDRON (Chair)

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Dr. Ing. Theodor IONESCU (Romania)  
Prof. Datong QIN (China-Beijing)  
Prof. Bahram RAVANI (USA)  
Prof. James TREVELYAN (Australia)  
Prof. Miroslav VÁCLAVÍK (Czech Republic)

## IFTToMM Permanent Commission Chairs

Communications: Prof. Leila NOTASH (Canada)  
Education: Prof. Juan Carlos GARCIA-PRADA (Spain)  
History of Mechanism and Machine Science: Prof. Hanfried KERLE (Germany)  
Publications: Prof. Marco CECCARELLI (ad tempore)  
Standardization of Terminology: Dr. Ir. Antonius KLEIN BRETELER (Netherlands)

## IFTToMM Technical Committees Chairs

Computational Kinematics: Prof. Doina PISLA (Romania)  
Gearing and Transmissions: Prof. Daizhong SHU (United Kingdom)  
Human-Machine Systems: under selection  
Linkages and Mechanical Controls: Prof. Dr-Ing. Burkhard CORVES (Germany)  
Micromachines: Prof. G. K. ANANTHASURESH (India)  
Multi-Body Dynamics: Prof. Javier CUADRADO (Spain)  
Reliability: Prof. Zbigniew KEZY (Poland)  
Robotics and Mechatronics: Prof. I-Ming CHEN (Singapore)  
Rotordynamics: Prof. J. S. RAO (India)  
Sustainable Energy Systems: Prof. Ion VISA (Romania)  
Transportation Machinery: Dr. Madhusudan RAGHAVAN (USA)  
Tribology: Prof. Jianbin LUO (China-Beijing)  
Vibrations: Prof. Marian WIERCIGROCH (United Kingdom)

## IFTToMM Member Organizations

ARMENIA	AUSTRALIA	AUSTRIA
AZERBAIJAN	BELARUS	BRAZIL
BULGARIA	CANADA	CHINA-BEIJING
CHINA-TAIPEI	CROATIA	CZECH REPUBLIC
DENMARK	EGYPT	FINLAND
FRANCE	GEORGIA	GERMANY
GREECE	HUNGARY	INDIA
ISRAEL	ITALY	JAPAN
KAZAKHSTAN	KOREA	LITHUANIA
MACEDONIA	MEXICO	MONGOLIA
NETHERLANDS	PERU	POLAND
PORTUGAL	ROMANIA	RUSSIA
SERBIA	SINGAPORE	SLOVAKIA
SLOVENIA	SPAIN	SWITZERLAND
TUNISIA	TURKEY	UKRAINE
UNITED KINGDOM	USA	VIETNAM

## **Organizing Committee**

**Chair: Prof. Ricardo Chicurel-Uziel**

**Scientific Committee: Prof. José María Rico**

**Local Committee: Profs. J. Jesús Cervantes and Jacqueline Cueto**

**Exhibition Committee: Prof. Adrián Espinosa**

**Administration Committee: Profs. Alberto Caballero and Leopoldo Ruiz**

**Communications Committee: Prof. Jesús Manuel Dorador**

**Transportation and Visas: Profs. Carlos López-Cajún and Alfonso Pámanes**

**Logistics Committee: Prof. Isidro Torres**

**Logistic Coordinator: Lic. Emelia Hernández Ochoa**

The Organizing Committee thanks the financial support of the following institutions:

**Universidad de Guanajuato**

**Universidad Nacional Autónoma de México**

**Consejo Nacional de Ciencia y Tecnología**

**Instituto Tecnológico de Celaya**

**Instituto Tecnológico Superior de Irapuato**

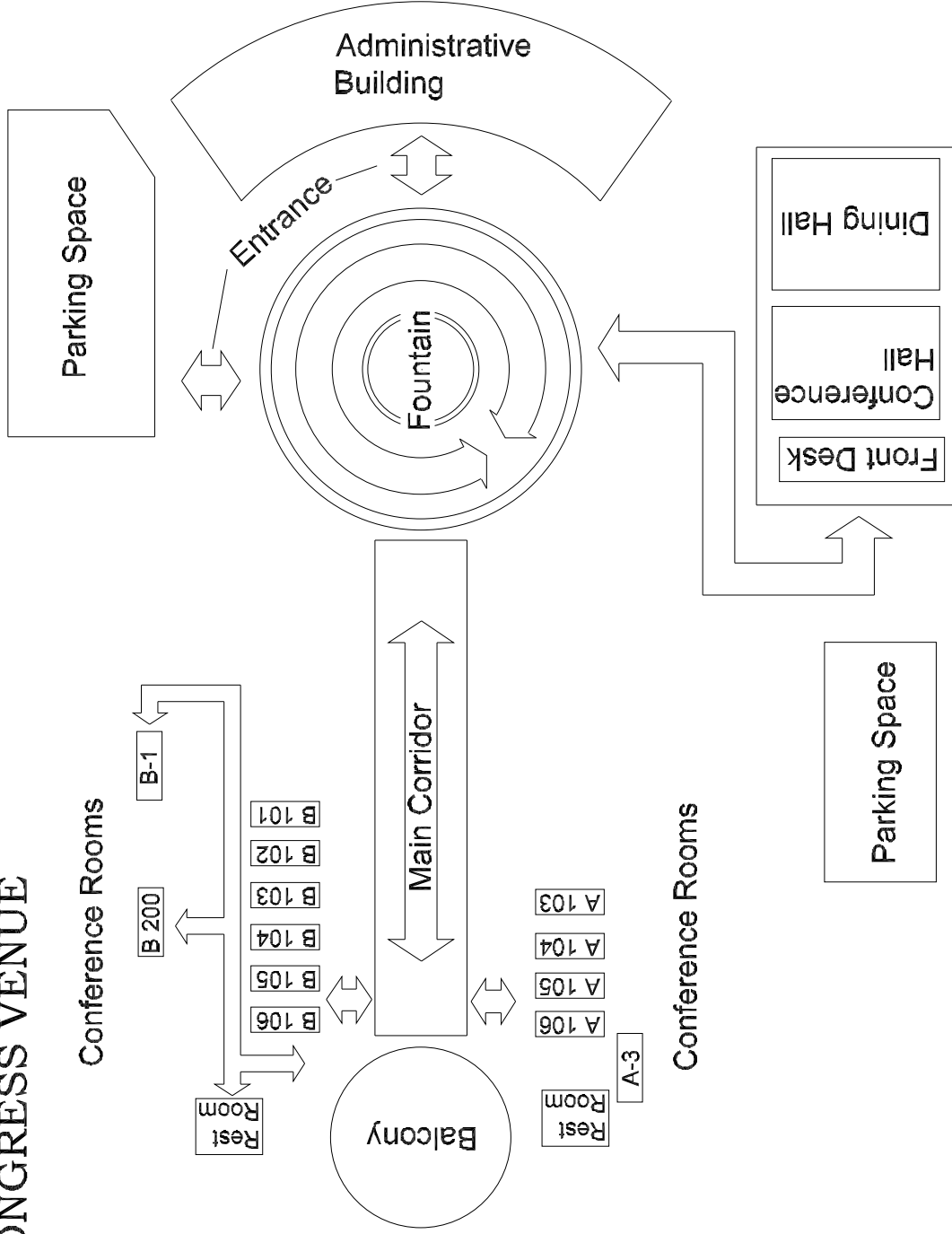
**Universidad Politécnica de Irapuato**

**Instituto Tecnológico de Pachuca**

**Universidad Tecnológica del Suroeste de Guanajuato**

**Consejo de Ciencia y Tecnología del Estado de Guanajuato**

# CONGRESS VENUE



# Final Program

## Thirteenth world congress in mechanism and machine science

Sunday, June 19

Time	Event	Location
9:00–15:00	Executive Committee Reunion	Dining Hall
10:00–18:00	Registration	Holiday Inn Hotel
10:00–13:00	Tutorials	Rooms A-3, A-103
13:00–15:00	Lunch Break for Tutorials	Rooms A-3, A-103
15:00–18:20	Tutorials	Rooms A-3, A-103
19:00–21:30	Welcoming Cocktail	Dining Hall

Monday, June 20

Time	Event	Location
7:30–9:00	Registration	Front Desk Congress Venue
9:00–10:30	Opening Ceremony	Conference Hall
10:40–11:40	Keynote Speaker 1	Conference Hall
12:00–13:00	Technical Sessions	Lecture Rooms
13:00–15:00	Lunch	Dining Hall
15:00–17:00	Technical Sessions	Lecture Rooms
17:00–17:20	Coffee Break	Balcony
17:20–18:20	Technical Sessions	Lecture Rooms
18:20–21:30	TC/PC Committees Meetings	Lecture Rooms

Tuesday, June 21

Time	Event	Location
8:30–9:00	Registration	Front Desk Congress Venue
9:00–10:00	Keynote Speaker 2	Conference Hall
10:00–11:40	Technical Sessions	Lecture Rooms
11:40–12:00	Coffee Break	Balcony
13:00–15:00	Lunch	Dining Hall
15:00–17:00	Technical Sessions	Lecture Rooms
17:00–17:20	Coffee Break	Balcony
17:20–18:20	Technical Sessions	Lecture Rooms
18:45–20:00	Flokloric Ballett	Conference Hall
18:20–21:30	TC/PC Committees Meetings	Lecture Rooms

Wednesday, June 22

Time	Event	Location
8:30–9:00	Registration	Front Desk Congress Venue
9:00–10:00	Keynote Speaker 3	Conference Hall
10:00–11:40	Technical Sessions	Lecture Rooms
11:40–12:00	Coffee Break	Balcony
13:00–15:00	Lunch	Dining Hall
15:00–17:00	Technical Sessions	Lecture Rooms
17:00–19:00	General Assembly, Closing Session	Conference Hall
19:00–22:00	Gala Dinner	Dining Hall

Thursday, June 23

Time	Event	Location
9:00–15:00	Executive Committee Reunion	Dining Hall

Program for the Meetings of the Technical Committees and Permanent Comissions					
Day and Room	Room B-106	Room A-106	Room B-105	Room A-103	Room A-105
Monday 18:20-21:30	Education	Communications	History of Mechanism and Machine Science	Computational Kinematics	Human-Machine Systems
	Room B-104	Room A-104	Room B-103	Room B-102	
Monday 18:20-21:30	Linkages and Mechanical Controls	Multi-Body Dynamics	Vibrations	Sustainable Energy Systems	
Day and Room	Room B-106	Room A-106	Room B-105	Room A-103	Room A-105
Tuesday 18:20-21:30	Publications	Standardization of Terminology	Micromachines	Robotics and Mechatronics	Rotordynamics
	Room B-104	Room A-104	Room B-103	Room B-102	
Tuesday 18:20-21:30	Transportation Machinery	Tribology	Reliability	Gearing and Transmissions	

## Keynote Speaker



**Prof. Arturo Lara-López**

**Abstract of the keynote lecture:  
Impact of Strategies for Cooperative Project of R&D**

**Monday, June 20, 10:40-11:40 A.M.  
Conference Hall**

A comparative analysis of different strategies for projects of research and development is presented. Discussion is based on cases developed in the state of Guanajuato, Mexico, with emphasis on the origin of projects. Three main strategies are considered: innovative technologies originated and developed in the University atmosphere, projects proposed by individual industries and projects originated in local medium size industrial sectors. Specific examples are related to innovative design of machines or mechanical analysis.

## Biography

Arturo Lara-López completed his Ph.D. at the University of California at Davis, 1980, a Master's Degree in Mechanical Engineering from the UNAM, 1970 and a Bachelor's Degree in Mechanical Engineering from the Universidad de Guanajuato, 1970. He has taught more than 24 different courses related with dynamic systems and machinery design at Universidad de Guanajuato since 1969. His research interests are concerned with the fields of mechanical vibrations applied to the analysis and design of eolic dampers for high tension lines, whose results have been transferred to manufacturing plants and testing laboratories. He has been involved in the development of agricultural machines which include cultivators of high ground clearance produced in pilot form for two companies, as well as hydrostatic

vehicles of high ground clearance and fruit harvesting devices. He has over 65 publications and presentations. He was involved in the obtaining of the patent Improvements in Cultivators of High Ground Clearance, number 158176, and another patent is in process for a new principle for the non-selective harvest of prickly pears. His research has been sponsored by various agencies which include CONACYT, OAS, SEP (Public Ministry of Education) and various state and private industries. His research has led to the direction of 5 doctoral thesis, 14 master's degree thesis and 11 undergraduate thesis. As general director of the Guanajuato State Council for Science and Technology (CONCYTEG), he instrumented a strategy for linking industry with academia, achieving between 1996 and 2002 the management of 270 projects, in which there were 650 researchers of the State of Guanajuato sponsored by companies, chambers and government organizations. For his academic and administrative contributions Dr. Arturo Lara López has received numerous distinctions, including: 1980 National Academy of Engineering of México Prize, Distinguished Alumnus of the College of Engineering of the University of California at Davis, and the Emil Mrak Prize for International Action from the same University (2001). Currently he is the General Rector (President) of the Universidad de Guanajuato.

## Keynote Speaker



**Prof. Yuichi Okazaki**

**Abstract of the keynote lecture:  
Micromanufactories: A New Methodology for Sustainable Manufacturing**

**Tuesday, June 21, 9:00-10:00 A.M.  
Conference Hall**

In the last decade, the miniaturization and integration of mechanical, electronic, and optical components has seen intensive development, both for industrial and consumer products. The technology involved in micromanufacturing can be now seen as moving from the academic study phase to that of industrial application. At the same time, the manufacturing industry is being forced to accommodate these changes in products in order to survive in a borderless international market, not only due to technical considerations but in the interest of cost-effectiveness and agility as well. The environment is also a consideration.

To accommodate these demands, further scientific and technological advancement will be required. On the other hand, industrial applications should be developed in order to make the output of the manufacturing industries more economically advantageous and sustainable.

“Microfactory” is the philosophy of reducing the size of manufacturing machinery and systems to make them appropriate to the size of the products. It is important that there be advances in micromanufacturing to open this potential new stage for cutting edge manufacturing. The microfactory concept was born almost twenty years ago in Japan, but is now commonly understood and studied worldwide. Actually, a number of practical implementations of the concept into the manufacturing industry and R&D’s can be seen.

Furthermore, the concept has potential to explore its application range, including heavy-duty industries like automobile and semiconductor, small-scale or even personal manufacturing, education, space, medical field, etc., so that it enhances the creativity of human being in an accommodating way to the century's demand.

## **Biography**

Dr. Yuichi Okazaki graduated from Tokyo University of Agriculture and Technology in 1979, and joined former Mechanical Engineering Laboratory (MEL), Agency of Industrial Science and Technology (AIST), MITI, Japan. In his carrier as a research scientist in the institute for over 25 years, he has conducted R&D on ultra-precision machine tools, precision motion control, microfactory, etc. In the latest decade, while developing unique micro machine tools like NC micro-lathe, desktop milling machines, Dr. Okazaki has been collaborating with those private sectors who are trying to apply the philosophy of "Microfactory" to industrial manufacturing.

## Keynote Speaker



**Prof. Michael McCarthy**

**Abstract of the keynote lecture:  
The Task Selection Problem in the Kinematic Synthesis of Linkages**

**Wednesday, June 22, 9:00-10:00 A.M.  
Conference Hall**

The presentation focusses on a fresh look on the classical kinematics synthesis problem. Starting from the three basic problems of planar kinematic synthesis: motion generation, function generation and point path generation, it is shown how to generalize these tasks to spherical and spatial linkages, and how to extend the approach to serial chains and multi-loop linkages.

## Biography

J. Michael McCarthy is the Henry Samueli Professor and Director of the Center for Engineering Science in Design at the University of California, Irvine, which supports the design and execution of team engineering projects across the School of Engineering. He completed his Ph.D. at Stanford University, and has taught at Loyola Marymount University and the University of Pennsylvania before joining UCI's Mechanical Engineering Department in 1986. He has over 150 publications and three books including *The Geometric Design of Linkages* (Springer 2000, 2nd Ed. 2010). His research team is responsible for the Sphinx and Synthetica software packages, which extend computer-aided design to spherical and spatial linkage systems. He has presented tutorials on the design of linkages and robotic systems at ASME and IEEE conferences. He is an industrial consultant in the area of machine and

robotic system design, and provides testimony on intellectual property and product liability. He served as Chief Technical Officer of Accuray Incorporated to assist the transition of a robotic radio-surgery system from research to market, and returned to UCI with a commitment to developing leadership through student design and execution of major engineering projects. His student teams have built 10 racecars of various types, and his 2009 Formula Hybrid team was fifth out of thirty teams at the New Hampshire Speedway in May 2009. His 2010 FSAE team placed 1st in energy efficiency out of 79 teams. He is currently Chair of the Board of Governors of the Southern California Section of SAE international. His contributions in teaching were recognized by a 2010 UCI Teaching Excellence in Undergraduate engineering Award and the Henry Samueli School of Engineering's 2009 Faribor Maseeh Teaching Award. He is a Fellow of the American Society of Mechanical Engineers (ASME), and has received the 2008 ASME Outstanding Service Award and the 2009 ASME Machine Design Award.

# Technical Program

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Monday, June 20

10:40-11:40

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Conference Hall

Keynote Lecture 1, Ch. Prof. Ricardo Chicurel

Impact of Strategies for Cooperative Project of R&D

**Prof. Arturo Lara-López**, Universidad de Guanajuato, México.

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Monday, June 20

12:00-13:00

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## Robotics and Mechatronics I, Ch. Prof. R. Di Gregorio, Room B-1

- A12-264, Under-Actuated Nonholonomic Parallel Wrists, **R. Di Gregorio**, University of Ferrara, Ferrara, Italy.
- A12-260 Slip Decrease in Mobile Robots, **T. Zielinska**, and **A. Chmielniak**, Warsaw University of Technology, Institute of Aeronautics and Applied Mechanics (WUT IAAM), ul. Nowowiejska, Warsaw, Poland.
- A12-267, Position Control of a 3R Underactuated Robot Based on Genetic Algorithm, **Q. Xia**, Beijing University of Technology, Beijing Union University, **Y.Q. Yu**, Beijing University of Technology, and **Q. Liu**, Beijing University of Technology, China ASIT Co, Ltd, Beijing, China.

## Robotics and Mechatronics II, Ch. Prof. N. Imamura, Room A-103

- A12-268, A new-type Torque Limiter with Friction Adjusting Mechanism for Robots, **N. Imamura**, **A. Yoshida**, Hiroshima International Univ., Hiroshima, Japan, **A. Sato**, TOYOTA Motor Corp., Aichi, Japan, and **K. Nagamura**, Hiroshima Univ., Hiroshima, Japan.
- A12-277, On the Design Conditions of Planar Parallel Manipulators in Near-Singular Configurations, **S. Briot**, IRCCyN-CNRS, Nantes, France, **V. Glazunov**, Russian Academy of Sciences, Moscow, Russia, and **V. Arakelian**, INSA, Rennes, France.
- A12-286, Bio-Inspired Design and Control of the Waseda Saxophonist Robot, **J. Solis**, **A. Takanishi**, Waseda University, Tokyo, Japan, and **K. Hashimoto**, Toyota Motor Corporation, Toyota, Japan.

## Computational Kinematics I, Ch. Prof. B. Ravani, Room A-3

- A7-566, Kinematic Registration Using Contact Sensing, **W. W. Nederbragt**, Lawrence Livermore National Laboratory, Livermore, California, **and B. Ravani**, Department of Mechanical and Aeronautical Engineering, University of California, Davis, Davis, California, USA.
- A7-278, Isotropic Design of a 2 dof Parallel Kinematic Machine with a Translational Workpiece Table, **H. A. Moreno**, Technical University of Madrid, Madrid, Spain, **and J. A. Pamanes**, Autonomous University of Coahuila, Torreón, México.
- A7-282, Kinematic Analysis of a New Over-constraint Parallel Kinematic Machine, **Y. Jin**, School of Mechanical and Aerospace Engineering, Queen's University Belfast, UK, **Z. Bi**, Department of Engineering, Indiana University Purdue University Fort Wayne, Fort Wayne, USA, **R. Gibson**, **P. McToal**, **M. Morgan**, **C. McClory**, **and C. Higgins**, Northern Ireland Technology Center, Queen's University Belfast, UK.

## Gearings I, Ch. S. Y. Yeh, Room A-106

- A9-270, An Analytical Approach for Load Sharing Analysis of Planetary Gear Drives, **S. J. Tsai**, **G. L. Hwang**, **and S. Y. Yeh**, National Central University, Jhong-Li, Taiwan.
- A9-274, Variational and Non-Variational Solution Methods of Flat Engagements Optimization Problem by Friction Power Criterion, **V. P. Prokhorov**, New Russian University, Moscow, Russia.
- A9-289, Optimized Polynomial Functions for Inducing Variation to Machine Tool Settings in Manufacturing Hypoid Gears, **V. Simon**, Budapest University of Technology and Economics, Budapest, Hungary.

## Linkages and Cams I, Ch. Prof. E. Söylemez, Room B-106

- A11-281, Some New Overconstrained Linkages Obtained From Homothetic Jitterbug-Like Linkages, **G. Kiper** **and E. Söylemez**, Middle East Technical University, Ankara, Turkey.
- A11-302, Intersection of Two 5D Submanifolds of the Displacement 6D Lie Group:  $X(u)X(v) \cap X(s)X(t)$ , **C. C. Lee**, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan ROC, **and J. M. Hervé**, Ecole Centrale Paris, Chatenay-Malabry, France.
- A11-587, Design of a Mechanism for an eight Link Sculpture, **S. Castañeda Cedeño**, **J. M. Dorador González**, **E. Sánchez Medina**, **H. Mancilla Alonso** **and A.**

**Hernández Delgadillo**, Departamento de Ingeniería Mecatrónica, Facultad de Ingeniería, Universidad Nacional Autónoma de México, Circuito Exterior, Cd. Universitaria, México, D.F.

### **Design Methodology I, Ch. Prof. P. Mitrouchev, Room A-105**

- A23-284, Restricted Morphological Method for Choice of Driving Mechanisms in Robotics with 1 and 2 Degrees on Mobilities, **P. Mitrouchev**, G-SCOP Laboratory, Grenoble, France.
- A23-276, Three-Link Mechanisms Classifier by Functional Features, **V. P. Prokhorov**, New Russian University, Moscow, Russia.
- A23-559, Task Based Conceptual Design Method, **H. V. Darbinyan**, Olympiatols International, Yerevan, Armenia.

### **Biomechanics I, Ch. Prof. J. P. Merlet, Room B-104**

- A22-485, A Multi-sensors System for Human Motion Measurement: Preliminary Setup, **M. Harshe, J-P. Merlet, D. Daney**, INRIA, Sophia-Antipolis, France, **and S. Bennour**, ENIM, Monastir, Tunisia.
- A22-343, Human Lower Limb Kinematic Analysis with Application on Prosthesis Mechanical Systems, **C. P. Copilusi, N. Dumitru and M. Marin**, University of Craiova, Craiova, Romania.
- A22-414, Design and Development of an Optical System for 3D Direct Detection of Dental Arch Model from the Patient's Mouth and a Robotic System for Guiding Implant Positioning, **P. Nudo, M. Perrelli, M. Donnici, G. Danieli**, University of Calabria / Calabrian High Tech Srl - Rende Italy, **F. Inchingolo MD**, University of Bari Italy, **F. Giuzio MD**, Private Study, Cosenza, Italy, **and M. Marrelli MD**, Dentalia Srl, Crotona, Italy.

### **Transportation Machinery I, Ch. Prof. A. Charchalis, Room B-105**

- A18-254, Conditions of carrying out and verification of diagnostic evaluation in a vessel, **A. Charchalis**, Gdynia Maritime University, Gdynia, Poland.
- A18-363, Architectural Study of Hybrid Electric Propulsion Systems for Indian Cities, **A. Ghosal**, Indian Institute of Science, Bangalore, India, **and V. Prasad Atluri**, GM Global Research and Development, Warren, USA.
- A18-353, Propulsion System Electrification, **Madhu Raghavan**, GM Global Research and Development, Warren, USA.

### **Robotics and Mechatronics III, Ch. Prof. S. Fatikow, Room B-1**

- A12-322, Design and Control of a Nanohandling Robot, **S. Fatikow, C. Edeler, C. Diederichs, I. Meyer and D. Jasper**, Division Microrobotics and Control Engineering, Oldenburg University, Oldenburg, Germany.
- A12-296, The Reducible Design of 6-DOF Parallel Micro Manipulator Based on Screw Theory, **Y. Yue, F. Gao and H. Ge**, Shanghai Jiao Tong University, Shanghai, China.
- A12-332, Design and Simulation of a Binary Actuated Parallel Micro-Manipulator, **G. Carbone, C. Liang, H. Gu, M. Ceccarelli**, University of Cassino, Cassino, Italy, **A. Burisch and A. Raatz**, Technical University of Braunschweig, Braunschweig, Germany.

### **Robotics and Mechatronics IV, Ch. Prof. K. Gotlih, Room A-103**

- A12-326, A Reverse Engineering Technique and its Possibilities in Robotics, **K. Gotlih, S. Brezovnik, J. Balic, and M. Brezocnik**, University of Maribor, Maribor, Slovenia.
- A12-335, On Adaptive Control of Singularly Perturbed Systems- a Worm-like Locomotion Example, **C. Behn and J. Steigenberger**, Ilmenau University of Technology, Ilmenau, Germany.
- A12-342, Haptic Teleoperation of a Manipulator using Virtual Fixtures and Hybrid Position-Velocity Control, **M. R. Wrock and S. B. Nokleby**, University of Ontario Institute of Technology, Oshawa, Canada.

### **Computational Kinematics II, Ch. Prof. K. Wohlhart, Room A-3**

- A7-290, Intersection of Vector Spaces The Shuffle Formula, **K. Wohlhart**, Graz University of Technology, Graz Austria.
- A7-253, Multi-objective Optimization of Parallel Manipulator Using Global Indices, **F.A. Lara-Molina and J.M. Rosario**, UNICAMP, Campinas-SP, Brazil, **E. A. Portilla-Flores**, CIDETEC-IPN, México, and **D. Dumur**, SUPELEC, Gif sur Yvette-Cedex, France.

- A7-283, Inverse Geometrico-Static Problem of Under-Constrained Cable-Driven Parallel Robots with Three Cables, **M. Carricato**, University of Bologna, Bologna, Italy, and **J.-P. Merlet**, INRIA, Sophia-Antipolis, France.

### **Gearings II, Ch. Prof. V. Simon, Room A-106**

- A9-288, Generation and Tooth Contact Analysis of Face-Hobbed Spiral Bevel Gears, **V. Simon**, Budapest University of Technology and Economics, Budapest, Hungary.
- A9-275, Synthesis and Optimization of Engagements in a Plane by the Pressure Angle using Euler Method, **V.P. Prokhorov**, New Russian University, Moscow, Russia.
- A9-317, Design and Manufacture of Noncircular Bevel Gears, **C. Lin, Y. Hou, H. Gong and Q. Zeng**, The State Key Lab. of Mechanical Transmission, Chongqing University, Chongqing, China.

### **Linkages and Cams II, Ch. Prof. L. P. Laus, Room B-106**

- A11-305, Coupling Networks Dual with Planar Revolute Coupled Linkages in Critical Configurations, **T. H. Davies**, Loughborough University, Leicestershire, UK. and **L. P. Laus**, Federal University of Technology - Paraná (UTFPR), Paraná, Brazil.
- A11-306, Tolerance Analysis of Parallel Mechanism with Link Dimension Deviation and Joint Clearance, **J. X. Yang**, Beijing University of Technology, **J. Y. Wang**, Tsinghua University, Beijing, China, **N. Anwer and B. Anselmetti**, ENS de Cachan, Cachan, France.
- A11-256, On Cam System Design to Replicate RRSS Motion Generation, **Q. Shen**, ASCO Power Technologies, Florham Park, NJ, U.S.A., **K. Russell**, U.S. Army ARDEC, Picatinny, NJ, U.S.A., **W. Lee**, Leader University, Tainan, Taiwan, and **R. S. Sodhi**, New Jersey Institute of Technology, Newark, NJ, U.S.A.

### **Design Methodology II, Ch. Prof. V. Glazunov, Room A-105**

- A23-324, Research on Bicycle Riding Comfort Evaluation, **Z. Xiang, S. Lan, D. Chen and Y. Yang**, Tianjin University, Tianjin, China.
- A23-325, Design and Research on Roll-shape Parameter of a Two-roll Straightener, **D. C. Hu and J. G. Chen**, Shanghai Institute of Technology, Shanghai, China.
- A23-346, On Two Kinds of Decoupled Parallel Mechanisms, **V. Glazunov, L. Tyves, P. Danilin, K. Shalyukhin and S. Levin**, Mechanical Engineering Research Institute, Moscow, Russia.

## Biomechanics II, Ch. Prof. V. Parenti-Castelli, Room B-104

- A22-546, Passive Motion Modeling of the Human Ankle Complex Joint, **B. Baldisserri and V. Parenti-Castelli**, University of Bologna, Bologna, Italy.
- A22-602, Kinematical Modeling and Simulation of Quadruped Biomechanism, **I. D. Geonea, A. Margine, N. Dumitru and V. Rosca**, Craiova University, Craiova, Romania.
- A22-547, A New Method to Solve Kinematic Consistency Problem Based on Optimization Techniques and Euler Parameters, **J. Ojeda, J. Mayo and J. Martínez-Reina**, University of Seville, Seville, Spain.

## Micro Electromechanical Systems (MEMS) I, Ch. Prof. A. Buchacz, Room B-105

- A31-580, Analysis of the Mechatronic System with Piezoelectric Actuator Based on the Approximate Method, **A. Buchacz and M. Placzek**, Silesian University of Technology, Gliwice, Poland.
- A31-584, Analysis of one Side Fixed Piezoelectric Plate Model, **A. Wróbel**, Silesian University of Technology, Gliwice, Poland.
- A31-595, Fabrication of PolySilicon Microstructures using the PolyMEMS INAOE Technology, **D. Diaz-Alonso, F.J. Quiñones-Novelo, C. Zuñiga-Islas, J. Molina, J. Hidalgo, M. Linares, P. Rosales, A. Torres-Jacome, C. Reyes and W. Calleja**, Li-MEMS INAOE, Puebla, Mexico.

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Monday, June 20

16:00-17:00

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## Robotics and Mechatronics V, Ch. Prof. J. J. Lee, Room B-1

- A12-333, Topological Synthesis of Underactuated Passively Adaptive Finger Mechanisms, **C. W. Chuang and J. J. Lee**, Department of Mechanical Engineering, National Taiwan University, Taipei, Taiwan.
- A12-331, On the Design of Workspaces of Serial Mechanisms, **S. Brezovnik, K. Gotlih, J. Balic and M. Brezocnik**, University of Maribor, Maribor, Slovenia.
- A12-358, Reduced Elastodynamic Modelling of Parallel Robots for the Computation of their Natural Frequencies, **S. Briot, D. Chablat, IRCCyN - CNRS, and A. Pashkevich**, IRCCyN - CNRS / Ecole des Mines de Nantes, Nantes, France.

## **Robotics and Mechatronics VI, Ch. Prof. I. M. Chen, Room A-103**

- A12-365, Human-like Walking of Humanoid Robot Based on Biped Kinematics and Captured Motion of Human, **Q. Yuan and I. M. Chen**, School of Mechanical and Aerospace Engineering Nanyang Technological University, Singapore.
- A12-360, Failure Recovery for Wrench Capability of WireActuated Parallel Manipulators, **L. Notash**, Queen's University, Kingston, Canada.
- A12-364, A Fully-Isotropic Parallel Orientation Mechanism, **C. H. Kuo and J. S. Dai**, King's College London, London, United Kingdom.

## **Computational Kinematics III, Ch. Prof. C. C. Lee, Room A-3**

- A7-314, Mobility Constraints and Configurations of 3- and 5-bar AKC Mechanisms, **C. C. Lee, and C. Y. Loe**, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan.
- A7-361, Forward Kinematics of the Symmetric 5-DOF Parallel Mechanisms (3R2T) Using the Linear Implicitization Algorithm, **M. Tale Masouleh, C. Gosselin**, Laval University, Quebec, Canada, **D. R. Walter, and M. L. Husty**, University of Innsbruck, Innsbruck, Austria.
- A7-385, Simulation of Length-Preserving Motions of Flexible One Dimensional Objects using Optimization, **S. Banerjee, M. S. Menon, G. K. Anathasuresh, and A. Ghosal**, Mechanical Engineering, Indian Institute of Science, Bangalore, India.

## **Gearings III, Prof. V. Barzdaitis, Room A-106**

- A9-312, Modeling and Simulation of the Gear Power Transmissions in the Diagnostics Medium, **V. Barzdaitis**, Kaunas University of Technology, Kaunas, Lithuania, **P. Mažeika, J. Grigonienė, and R. Didžiokas**, Klaipeda University, Mechatronic Science Institute, Klaipeda, Lithuania.
- A9-297 Optimization of Flat Engagements by Zero-Order Criterion Using Euler Variational Method, **V.P. Prokhorov**, Russian New University, Moscow, Russia.
- A9-379, Study on Dynamic Characteristics of Gear Transmission System of Wind Turbine, **D. Qin and F. Tang**, Chongqing University, Chongqing, China.

## **Linkages and Cams III, Ch. Prof. J. Angeles, Room B-106**

- A11-344, Synthesis of Function-Generating Linkages with Minimax Design Error: The Linear Case, **F. Angeles**, SSTECH, Mexico, D.F., Mexico, **and J. Angeles**, Centre

for Intelligent Machines and Department of Mechanical Engineering McGill University, Montreal, QC Canada.

- A11-315, Kinematic Analysis and Cam Synthesis of a Variable Valve Lift Mechanism with General Curve Contact, **S. Mihalcea N. and D. Stănescu**, University of Pitești, Pitești, Romania.
- A11-337, Development of Mechanisms for Adjusting Positions of a Multifunctional Bed, **N. D. Pavlović, M. Milošević and N. T. Pavlović**, University of Niš, Niš, Serbia.

### **Design Methodology III, Ch. Prof. A. Masiulis, Room A-105**

- A23-351, Nondimensional Analysis of a Crank-Slide-Block Mechanism Kinematic Parameters, **J. Grigoniene and A. Masiulis**, Klaipeda University, Klaipeda, Lithuania.
- A23-386, Analysis of Contact Stresses in Interference Fit Joints with Circumferential Round Notch on the Hub, **J.C. Pérez Cerdán, M. Lorenzo Fernández, C. Blanco Herrera and P. Moreno Pedríguez**, University of Salamanca, Salamanca, Spain.
- A23-390, A Normalization-Based Approach to the Mobility Analysis of Spatial Compliant Multi-Beam Modules, **G. Hao and X. Kong**, Heriot-Watt University, Edinburgh, UK.

### **Biomechanics III, Ch. Prof. J. Wojnarowski, Room B-104**

- A22-339, Kinematics of Constant Point Mechanism of Cardiosurgical Telemanipulator, **G. Ilewicz and J. Wojnarowski**, Silesian University of Technology, Gliwice, Poland.
- A22-370, Construction of a Realistic Hand Model with 22 Joint Freedoms, **M. J. Tsai, H. W. Lee and H. C. Chen**, National Cheng Kung University, Tainan, Taiwan.
- A22-524, Kinematics of an Exoskeleton of 3 Degree of Freedom for the Rehabilitation of Forearms, **H. Gonzalez, H. Sanabria and N. Chio**, University Autonomous of Bucaramanga, Bucaramanga, Colombia.

### **Robotics and Mechatronics VII, Ch. Prof. P. Bidaud, Room B-1**

- A12-440, Practical Consideration on the Identification of the Kinematic Parameters of the Staubli TX90 Robot, **H. Hage, N. Jardin**, MRI, 2PSR EDF R&D, Chatou, France, **and P. Bidaud**, ISIR, CNRS UMR 7222 Université Pierre et Marie Curie, Paris, France.
- A12-380, Configuration Transformation Theory from a Chain-type Reconfigurable Modular Mechanism-Rubik's Snake, **X. Ding, S. Lv and Y. Yang**, Beihang University, Beijing, China.
- A12-382, Spatial Abduction Mechanism for an Anthropomorphic Robotic Hand, **L-A. A. Demers and C. Gosselin**, Département de génie mécanique Université Laval, Québec, Qc, Canada.

### **Robotics and Mechatronics VIII, Ch. Prof. S. M. Wang, Room A-103**

- A12-391, A New Method for the Singularity Analysis of Planar Mechanisms with Multi-Degree of Freedom and Experimental Research, **X. Liu, S. M. Wang, R. Yuan**, Northwest Polytechnical University, **and N. Shan**, Engineering College of Armed Police Force, Xi'an, China.
- A12-415, A Robust Inverse Dynamics Formulation for Redundantly Actuated PKM, **A. Muller**, Chair of Mechanics and Robotics, University Duisburg-Essen, Germany.
- A12-408, Design and Dynamics of a Two-DOF Joint Actuated by One Single Motor, **Y. Y. Luo, F. Y. Zhao and C. R. Li**, Institute of Automation, Chinese Academy of Sciences, Beijing, China.

### **Computational Kinematics IV, Ch. Prof. M. Husty, Room A-3**

- A7-388, Kinematic Analysis of the TSAI-3UPU Parallel Manipulator using Algebraic Methods, **D. R. Walter and M. L. Husty**, University of Innsbruck, Innsbruck, Austria.
- A7-398, Kineto-static Analysis of a Spatial Closed-loop Mechanism Composed of Elastic Thin Strips, **N. Iwatsuki**, Tokyo Institute of Technology, Tokyo, Japan.

- A7-422, A Treatise on the Theory of Higher Kinematic Pair, **J. Švígler**, University of West Bohemia, Pilsen, Czech Republic.

### **Gearings IV, Ch. Prof. V.P. Prokhorov, Room A-106**

- A9-373, Kinematic Couples With Concave Line Of Contact, **V.P. Prokhorov**, Russian New University, Moscow, Russia.
- A9-371, Orthogonal Worm Gear with Worm Wheel Screw Motion, **N.I. Prokhorova**, Russian New University, Moscow, Russia.
- A9-396, Development of a Chain Planetary Transmission as Speed Increaser / Reducer for Renewable Energy Systems, **C. Jaliu, D. Diaconescu, R. Saulescu, O. Climescu and M. Neagoe**, Department of Product Design and Robotics Transilvania University of Brasov, Brasov, Romania.

### **Linkages and Cams IV, Ch. Prof. M. Dahan, Room B-106**

- A11-369, 6R Parallel Translational Device, **L. Racila**, University of Craiova, Craiova, Romania, **and M. Dahan**, FEMTO-ST, University of Franche-Comté, Besançon, France.
- A11-348, On the Size of Cam Mechanisms with Oscillating Follower, **E. C. Lovasz, D. Perju, E. Moldovan, D. Mărgineanu**, Politehnica University of Timișoara, Timișoara, Romania, **K. H. Modler and N. Modler**, Technische Universität Dresden, Dresden, Germany.
- A11-354, Optimization of a Spherical “Homokinetic” Linkage with Minimum Design Error and Maximum Transmission Quality, **D. Alizadeh, J. Angeles**, McGill University, Montreal, Canada, **and S. Nokleby**, University of Ontario Institute of Technology, Oshawa, Canada.

### **Design Methodology IV, Ch. Prof. M. Nakamura, Room A-105**

- A23-392, Intelligent and Reliability-based Robust Design on Mechanical Elements under Incomplete Probability Information, **G. Zhang and X. Gong**, Chongqing University, Chongqing, China.
- A23-402, Viscoplastic Constitutive Equation for Computer Simulation of Hot Working Processing and Development of Hot Torsional Test Rig, **I. Moriwaki, M. Nakamura, D. Iba, T. Iizuka, K. Saito**, Kyoto Institute of Technology, **and M. Asano**, Graduate School of KIT, Kyoto, Japan.

- A23-437, Optimizing the Design of the 13-Hinge Rectilinear Stage for High Straightness Translation, **F. Cosandier, V. Chatagny and R. Clavel** EPFL - LSRO, Lausanne, Switzerland.

### **Biomechanics IV, Ch. Prof. M. Swietlik, Room B-104**

- A22-425, Efficiency of Movable Type of Child Safety Restraint Systems in the Event of Head-on Collisions, **M. Swietlik, C. Rzymkowski and K. Kedzior**, Warsaw University of Technology, Warsaw, Poland.
- A22-609, Mechanical Systems of Third Order and Jerk Curves, **M. Popescu and P. Popescu**, University of Craiova, Craiova, Romania.

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Tuesday, June 21

9:00-10:00

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Conference Hall

Keynote Lecture 2, Ch. Prof. Alberto Caballero

Micromanufactories: A New Methodology for Sustainable Manufacturing

**Prof. Yuichi Okazaki**, National Institute of Advanced Industrial Science and Technology, Japan.

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Tuesday, June 21

10:00-11:40

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### Robotics and Mechatronics IX, Ch. Prof. S. Zeghloul, Room B-1

- A12-394, Multi Criteria Optimum Design of 3 dof Translational in Parallel Manipulators (3TPM), **M.A. Laribi, S. Zeghloul**, PPRIME CNRS-Université de Poitiers, ENSMA, France, **A. Mlika and L. Romdhane**, LGM, ENISo Université de Sousse, Tunisia.
- A12-407, Development of a Pipe Bender Using a Parallel Mechanism with 3-RPSR Structure with Six Degrees of Freedom, **Y. Takeda, X. Xiao, M. Higuchi S. Inada**, Tokyo Inst. Tech., **K. Hirose, Y. Yoshida and Y. Ishikura**, Kikuchi Seisakusho Co., Ltd., Tokyo Japan.
- A12-416, Development and Key Issues of the Ankle Rehabilitation Robots, **P. Sui, L. Yao, H. Wang**, Fuzhou University, Fuzhou, China, **and J. S. Dai**, King's College London, London, UK.
- A12-419, Development of Tailor-Made Robots - From Concept to Realization for Small and Medium-Sized Enterprises, **M. Hüsing, M. Riedel, B. Corves and M. Nefzi**, RWTH Aachen University, Aachen, Germany.
- A12-420, Workspace of a 3-RRPS Parallel Robot Leg with a Constant Orientation, **X. C. Zhao, C. K. Qi and F. Gao**, Shanghai Jiao Tong University, Shanghai, China.

### Robotics and Mechatronics X, Ch. Prof. P. Wenger, Room A-103

- A12-429, Singularity Analysis of 5-DOF Parallel Mechanisms 3T2R using Grassmann-Cayley Algebra, **S. Amine, S. Caro, P. Wenger**, IRCCyN, Nantes, France, **M. Tale-Masouleh and C. Gosselin**, Université Laval, Québec, Canada.

- A12-444, Effect of Variations in Design Parameters on the Workspace of Wire-actuated Parallel Manipulators, **V. Nazari and L. Notash**, Queen's University, Kingston, Canada.
- A12-461, Motion Generation for Biped Robots Based on Minimal Energy Control, **C. Santacruz and Y. Nakamura**, The University of Tokyo, Tokyo, Japan.
- A12-447, Optimum Strategies for Retrieving Lost Stiffness of Planar Wire-Actuated Parallel Manipulators after Failure, **A. Moradi and L. Notash**, Queen's University, Kingston, Canada.
- A12-377, Partitioning Instantaneous Degrees-of-Freedom and its Application to Three-Degrees-of-Freedom Parallel Manipulators, **A. C. Sekhar, A. Ghosal**, Dept. of Mechanical Engg. Indian Institute of Science, Bangalore, India, **and S. Bandyopadhyay**, Dept. of Engineering Design Indian Institute of Technology, Chennai, India.

### **Computational Kinematics V, Ch. Prof. C. Huang, Room A-3**

- A7-449, On the Rotation Curves of Stephenson III Six-Bar Linkage, **C. Chung, and C. Huang**, Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan.
- A7-421, On the Cuspidality of the Analytic 3-RPR, **M. Urizar, V. Petuya, O. Altuzarra and A. Hernández**, University of the Basque Country, Bilbao, Spain.
- A7-430, Persistent Screw Systems of Dimension Three, **M. Carricato**, University of Bologna, Bologna, Italy, **and J. M. Rico**, University of Guanajuato, Salamanca, Mexico.
- A7-463, Sensitivity Analysis of Parallel Manipulators Using a Fixed Point Interval Iteration Method, **M. Tannous**, Ecole Centrale de Nantes, Nantes, France, **S. Caro**, CNRS, IRCCyN, Nantes, France, **and A. Goldsztejn**, CNRS, LINA, Nantes, France.
- A7-502, A New Modeling Tool for Analysis of the Grouped Thrust System of Shield Machines, **W. Z. Guo, F. Gao, and Y. C. Deng**, Shanghai Jiao Tong University, Shanghai, China.

### **Gearings V, Ch. Prof. V. I. Goldfarb, Room A-106**

- A9-426, Optimization Approach to Computer-Aided Design of Spur and Helical Gears, **V. I. Goldfarb and A. A. Tkachev**, Izhevsk State Technical University, Izhevsk, Russia.
- A9-374, One-Criterion Efficiency Optimization Of Flat Engagements, **V.P. Prokhorov**, Russian New University, Moscow, Russia.

- A9-428, On “Perpetual Motion Machine Conversion, **N. M. Dehelean, L.M. Dehelean, E.Ch. Lovasz and V. Ciupe**, “Politehnica University, Timisoara, Romania.
- A9-329, Tracking of Flat Belts by Skewing Pulley Axis, **M. Egger**, FH-OOE, Wels, Austria, **and K. Hoffmann**, TU-Wien, Vienna, Austria.
- A9-431, An Optimal Model of Up-shifting Path for Bicycle Chainring, **Y. Z. Ma and S. J. Chiou**, National Chung Hsing University, Taichung, Taiwan.

### **Linkages and Cams V, Ch. Prof. I. Visa, Room B-106**

- A11-401, Synthesis of a 3RT Linkage Used for the Orientation with Large Angular Stroke of a PV Platform, **I. S. Hermenean, I. Visa, D. V. Diaconescu and N. Creanga**, Renewable Energy and Recycling, Transilvania University, Brasov, Romania.
- A11-375, Synthesis of Bar Linkage Mechanisms to Guide and Drive Rapiers, **A. Guha and C. Amarnath**, IIT Bombay, India.
- A11-376, Structural Analysis and Synthesis of Assur Groups Based on Their Topological Properties, **N. Krokhmal and O. Krokhmal**, Kurgan State University, Kurgan, Russia.
- A11-389, Kinematic Position Analysis of a Notable Bi-tetra-modal Linkage: the RRRCR Spatial Linkage, **J. J. Cervantes-Sánchez, J. M. Rico-Martínez, A. Tadeo-Chávez, G. I. Pérez-Soto, L. D. Aguilera**, DICIS-Universidad de Guanajuato, Salamanca, Gto., Mexico, **and L. Gracia**, Instituto IDF, Universidad Politecnica de Valencia, Valencia, Spain.
- A11-400, Synthesis of a RRSS Linkage for Tracking a Two Axis Photovoltaic System, **M. M. Vătăşescu, I. Vişu, D. Diaconescu and R. Săulescu**, Renewable Energy Systems and Recycling Research Centre, Transilvania University of Braşov, Braşov, România.

### **Design Methodology V, Ch. Prof. D. Martins, Room A-105**

- A23-427, Enumeration of Kinematic Chains and Mechanisms Review, **R. Simoni, A. P. Carboni, H. Simas and D. Martins**, Federal University of Santa Catarina, Florianopolis, Brazil.
- A23-501, Joint Stiffness Tuning for Compliant Robots: Protecting the Robot under Accidental Impacts, **D. M. Gan, N. G. Tsagarakis, J. S. Dai, D. G. Caldwell**, Italian Institute of Technology, Genoa, Italy, **J. S. Dai**, King’s College, London, UK.

- A23-467, Formulation of Approximate Generalised Experimental Data based Model for Machining Properties of Bamboo, **C. N. Sakhale, M. P. Singh, J. P. Modak**, Priyadarshini College of Engineering Nagpur University, and **P. M. Bapat**, Cummins College of Engineering for Women, Nagpur University, India.
- A23-442, Conceptual Design of Brake Disc Applied to Hybrid Electric Vehicles, **A. B. Rocha and Z. C. Silveira**, University of Sao Paulo, Sao Carlos, SP, Brazil.
- A23-493, String Matrix Based Geometrical and Topological Representation of Mechanisms, **K. T. Zhang, J. S. Dai**, King's College London, London, UK. **K. T. Zhang, Y. F. Fang and Q. Zeng**, Beijing Jiaotong University, Beijing, P. R. China.

### **Rotor Dynamics I, Ch. Prof. R. Rządkowski, Room B-104**

- A17-292, Analysis of Middle Bearing Failure In So-3 Jet Engine Using Tip-Timing, **R. Szczepanik, E. Rokicki, J. Sychala, M. Kowalski**, Air Force Institute of Technology, Warsaw, Poland, **R. Rządkowski**, and **M. Drewczyński**, Institute of Fluid-Flow Machinery, Gdańsk, Poland.
- A17-327, Resonance Effect, Critical and Resonance Velocities, **O. Zhyvotov**, Yuzhnoye State Design Office, Dnepropetrovsk, Ukraine.
- A17-355, Structural Vibration Analysis of Large-scale Wind Turbines Considering Periodically Time-Varying Parameters, **K. T. Kim**, and **C. W. Lee**, KAIST, Deajeon, Korea.
- A17-378, FE Modeling of Blade Couple with Friction Contacts under Dynamic Loading, **L. Pesek, L. Pust, F. Vanek**, and **J. Vesely**, IT AS CR, v.v.i., Prague, Czech Rep.
- A17-478, Continuous Models of Elastic Roll on Various Supports, **Kai Jokinen**, and **Erno Keskinen**, Tampere University of Technology, Finland.

### **Dynamics of Machinery I, Ch. Prof. X. Jin, Room B-105**

- A24-399, On the Equilibrium Point and Dynamic Stability of a Mechanism, **X. Jin and C. Yong**, Southwest Jiaotong University, Chengdu, China.
- A24-295, Tellegen's Theorem Applied to Machinery, **T. H. Davies**, Loughborough University, Leicestershire, UK. and **L. P. Laus**, Federal University of Technology - Paraná, Paraná, Brazil.
- A24-308, An Approach to Establish Vibration Response at all Bearings of a Countershaft Due to all Machine Elements on It, **G. D. Mehta and J. P. Modak**, Priyadarshini College of Engineering Nagpur University, Nagpur, India.

- A24-320, Dynamics Analysis of The Mechanical System of Lunar Sampling, **Z. Dong, S. Yin, H. Yang, H. Wang, H. Cheng, W. Fu**, China University of Mining and Technology, Beijing, China, **and S. Yin**, Beijing Spacecrafts, Beijing, China.
- A24-258, Using the Dynamic Compliance Method for Modal Analysis and Steady State Vibrations in the Fluid-Structure Interaction, **F. Malenovsky, F. Pochyly, L. Pohanka and M. Chlud**, BUT, Brno, Czech Republic.

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Tuesday, June 21

12:00-13:00

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### **Robotics and Mechatronics XI, Ch. Prof. Y. Nakamura, Room B-1**

- A12-460, Stabilizing Control of Personal Mobility with a Spherical Wheel Composed of Serial Kinematic Chain, **S. Ok and Y. Nakamura**, University of Tokyo, Tokyo, Japan.
- A12-470, A Pseudo-isotropic Three-phalanxe Under-actuated Finger, **G. Dandash, R. Rizk**, Lebanese University Doctoral School, Hadath, Lebanon, **S. Krut and E. Dombre**, Lirmm, Montpellier University-CNRS, 161 rue Ada, Montpellier France.
- A12-472, Modelling and Simulation of a Mobile Robot with Self-Locking Speed Reducers, **M. Wojtyra and J. Fraczek**, Institute of Aeronautics and Applied Mechanics Warsaw University of Technology, Warsaw, Poland.

### **Robotics and Mechatronics XII, Ch. Prof. S. K. Saha, Room A-103**

- A12-465, Synthesis and Design of a 2-DOF Haptic Device for Simulating Epidural Injection, **M. H. Koul, S. K. Saha**, Dept. of Mechanical Engg IIT Delhi, Hauz Khas, New Delhi, India, **D. Rabinowitz**, Dept. of M.E.M.S., Rice University, Houston, Texas USA. **and M. Manivannan**, Dept. of App. Mechanics IIT Madras, Chennai, India.
- A12-479, A Mechanical Calibration Approach for Binary Parallel Robots, **D. Schütz, A. Raatz and J. Hesselbach**, Technische Universität Braunschweig, Braunschweig, Germany.
- A12-483, Force Capabilities of Kinematically Redundant Planar Parallel Manipulators, **L. Weihmann, L. S. Coelho**, PUCPR, Curitiba, Brazil, **and D. Martins**, UFSC, Florianópolis, Brazil.

## Computational Kinematics VI, Ch. Prof. A. Müller, Room A-3

- A7-517, The Geometric vs Algebraic Definition of Mobility, **A. Muller**, University Duisburg-Essen, Germany, **and S. Piipponen**, University of Western Ontario. London (ON), Canada.
- A7-494, A Geometric Approach to the Characterization of Form Closure for Planar Joint, **A. Dawari and D. Sen**, Centre for Product Design and Manufacturing Indian Institute of Science, Bangalore, India.
- A7-561, Quadric Surface Fitting Applications to Approximate Dimensional Synthesis, **M. J. D. Hayes and S. R. Rucu**, Mechanical and Aerospace Engineering Carleton University, Ottawa, ON., Canada.

## Gearings VI, Ch. Prof. W. B. Shieh, Room A-106

- A9-458, Topological Synthesis of Fractionated Parallel Hybrid Transmission with Two Inputs, **W. B. Shieh**, Mingchi University of Technology, **D. Z. Chen and C. F. Tsai**, National Taiwan University, Taipei, Taiwan.
- A9-468, Adaptive Grid-Size Modelling of Helical Gear Pairs, **M. Barbieri, A. Zippo and F. Pellicano**, Università di Modena e Reggio Emilia, Modena, Italy.
- A9-411, Profile Shift Coefficients and Thickness Modification Coefficients for Straight Bevel Gears under Static Tooth Root Stress used on PV Tracking Systems, **R. Velicu, I. Vişa, G. Moldovean, and B. Butuc**, Transilvania University, Braşov, Romania.

## Linkages and Cams VI, Ch. Prof. G. Moroz, Room B-106

- A11-482, The Assembly Modes of Rigid 11-bar Linkages, **Ioannis Z. Emiris**, National and Kapodistrian University of Athens, Greece, **and Guillaume Moroz**, INRIA Nancy, France.
- A11-417, Synthesis Strategy for a Mechanism Based Test Bench for Compliant Structures, **U. Hanke, K-H. Modler**, IFKM - Technische Universität, **N. Modler, M. Zichner, P. Lucas**, ILK - Technische Universität, Dresden, Germany, **and S. Lin**, CDHK - Tongji University, Shanghai, PRC.
- A11-432, Linkages Modelling as Multibody Systems, **I. Visa and M. Comsit**, Transilvania University of Brasov, Brasov, Romania.

## **Design Methodology VI, Ch. Prof. N. M. Thanh, Room A-105**

- A23-511, On 4 - DOF Particularly Decoupled Parallel Mechanisms, **V. Glazunov**, Mechanical Engineering Research Institute, **S. Palochkin**, **S. Kheilo**, **M. Shirinkin**, Moscow State Textile University, Moscow, Russia, **and N. M. Thanh**, University of Transport, Ho Chi Minh City, Vietnam.
- A23-498, Topological Structure Designs of Front Crank Type Elliptical Motion Exerciser, **M. H. Hsu**, **H. P. Kuo**, **C. C. Hsueh**, **P. Y. Lin**, Kun Shan University, Tainan, Taiwan, **and H. H. Huang**, National Panting University of Science and Technology, Pingtung, Taiwan.
- A23-294, Structural Link Optimization of an Echography Robot, **S. Miossec** **and L. Nouaille**, PRISME Laboratory, University of Orléans, France.

## **Rotor Dynamics II, Ch. Prof. S. Braut, Room B-104**

- A17-469, Structural Optimization with Frequency Constraint of the Reinforced Concrete Columns of the Spring Mounted Turbine Generator Foundation, **S. Braut**, **R. Žigulic**, **G. Štimac**, **and A. Skoblar**, Faculty of Engineering, University of Rijeka, Rijeka, Croatia, **M. Butković**, Polytechnic of Karlovac, Karlovac, Croatia.
- A17-291, Forced Response of the Mistuned First Stage Compressor Bladed Disc of an Aircraft Engine - Experimental and Numerical Results, **R. Rzadkowski**, **A. Maurin**, **A. Maciejewska**, **M. Drewczyński**, **M. Soliński**, Institute of Fluid-Flow Machinery, Gdańsk, Poland, **R. Szczepanik**, **A. Zyluk**, **and K. Sybilski**, Air Force Institute of Technology, Warsaw, Poland.
- A17-603, Vibration-based Diagnostics of Rolling Element Bearings: State of the Art and Challenges, **C. Nataraj**, Department of Mechanical Engineering, Villanova University, Villanova, PA, USA, **and K. Kappaganthu**, Advanced Engineering Cummins Engine, Inc. Columbus, IN, USA.

## **Dynamics of Machinery II, Ch. Prof. T. Thuemmel, Room B-105**

- A24-438 Introduction to Modelling and Parameter Identification Methodology of Linkages by Measurements and Simulation, **T. Thuemmel** **and M. Rossner**, Technische Universität München Institute of Applied Mechanics, Munich, Germany.
- A24-434, Force-Displacement Model of Compliant Mechanisms using Assur Sub-Chains, **S. Durango**, **J. Correa**, **O. Ruiz**, **M. Aristizabal**, CAD CAM CAE Laboratory, EAFIT University, Medellín, Colombia, **J. Restrepo-Giraldo** **and S. Achiche**, Engineering Design and Product Development Technical University of Denmark, Lyngby, Denmark.

- A24-495, Dynamics of Stress Wave Propagation during Percussive Drilling Process, **E. K. Keskinen, T. Karvinen, J. Montonen**, Tampere University of Technology, Tampere, Finland, **and M. Heinonen**, Robit Rocktools, Lempäälä, Finland.
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Tuesday, June 21

15:00-16:00

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### **Robotics and Mechatronics XIII, Ch. Prof. S. B. Nokleby, Room B-1**

- A12-477, An Operator-Focused Algorithm for Tele-Operating Mobile Manipulators, **M. Frejek and S. B. Nokleby**, University of Ontario Institute of Technology, Oshawa, Ontario, Canada.
- A12-486, Consequences of the Use of Decentralized Controllers for Redundantly Actuated Parallel Manipulators, **T. Hufnagel**, Heilbronn University, Heilbronn, Germany **and D. Schramm**, University Duisburg-Essen, Chair of Mechatronics, Duisburg, Germany.
- A12-490, Inverse Dynamics of a 5-DOF Reconfigurable Parallel Robot, **N. Plitea, D. Pisla, C. Vaida, B. Prodan, R. Dadarlat**, Technical University of Cluj-Napoca, Memorandumului, Cluj-Napoca, Romania, **J. Hesselbach and A. Raatz**, Technical University of Braunschweig, Langer Kamp, Braunschweig, Germany.

### **Robotics and Mechatronics XIV, Ch. Prof. L. Baron, Room A-103**

- A12-488, Planar 3 Degree-of-Freedom Parallel Manipulator with an Articulated Platform Featuring a Planetary Gearbox, **Y. Vermette and L. Baron**, École Polytechnique, Montreal, Canada.
- A12-509, Trajectory-tracking Control of a Planar 3-RRR Parallel Manipulator with Singularity Avoidance, **C. Nasa and S. Bandyopadhyay**, Department of Engineering Design Indian Institute of Technology Madras, Chennai, India.
- A12-500, Modified Wren Platforms, **G. Kiper and E. Söylemez**, Middle East Technical University, Ankara, Turkey.

### **Computational Kinematics VII, Ch. Prof. D. Pisla, Room A-3**

- A7-543, Kinematics of New Parallel Structures with 3 and 4 DOF Using Planar Parallel Modules, **D. Pisla, N. Plitea, C. Vaida, A. Vidrean, M. Glogoveanu, D. Lese, and B. Konya**, Technical University of Cluj-Napoca, Memorandumului, Cluj-Napoca, Romania.

- A7-535, Multi-Objective Scale Independent Optimization of 3-RPR Parallel Mechanisms, **M. H. Saadatzi, H. D. Taghirad, M. Teshnehlab**, K.N. Toosi University, Tehran, Iran, **M. Tale Masouleh and C. Gosselin**, Laval University, Quebec, Canada.
- A7-528, Efficient Solution of Kinematics for Multi-loop Mechanisms using Gröbner Bases, **T. Uchida and J. McPhee**, University of Waterloo, Waterloo, Ontario, Canada.

### **Gearings VII, Ch. Prof. M. Pleguezuelos, Room A-106**

- A9-558, Analytical Expression of the Efficiency of Involute Spur Gears, **M. Pleguezuelos, J. Pedrero and M. Sánchez**, UNED, Madrid, España.
- A9-608, Offset Face Gear Tooth Surface Equations and Simulation, **Y. Guo, T. Wang and Q. Li**, Mechanical Engineering Institute, Tianjin University, Tianjin, China.
- A9-387, Mechanical Efficiency of Straight Bevel Gears Used in Photovoltaic Trackers Depending on Geometrical Parameters, **G. Moldovean, B. Butuc, R. Velicu, and C.C. Gavrilă**, Transilvania University, Brasov, Romania.

### **Linkages and Cams VII, Ch. Prof. B. Corves, Room B-106**

- A11-456, Descriptive and Intuitive Mechanism Design and Synthesis Using Geometry-Based Computer-Aided Methods, **B. Corves, M. Riedel and M. Hüsing**, RWTH Aachen University, Aachen, Germany.
- A11-464, Two Poses Synthesis of Spatial Linkages Using Similarity Transformation, **G. F. Bär, K.-H. Modler, J. Ehlig**, Technische Universität Dresden, Dresden, Germany, **and S. Lin**, Tongji University, Shanghai, China.
- A11-512, On Polynomial Flexure Hinges for Increased Deflection and an Approach for Simplified Manufacturing, **S. Linß, L. Zentner**, Department of Mechanism Technology Ilmenau University of Technology, **and T. Erbe**, Department of Engineering Design, Ilmenau University of Technology, Ilmenau, Germany.

### **Design Methodology VII, Ch. Prof. S. Żółkiewski, Room A-105**

- A23-555, Selection and Impact of Parameters in Composite Materials Designing, **S. Żółkiewski**, Silesian University of Technology, Gliwice, Poland.
- A23-540, A Spring-mass-lever Model, Stiffness and Inertia Maps for Single-input, Single-output Compliant Mechanisms, **S. Hegde, G. K. Ananthasuresh**, Mechanical Engineering, Indian Institute of Science, Bangalore, India.

- A23-545, Buckling as a New Perspective on Static Balancing of Mechanisms, **J. A. Gallego and J. L. Herder**, Dept. of BioMechanical Engineering, Delft University of Technology, Delft, The Netherlands.

### **Rotor Dynamics III, Ch. Prof. J. C. Gómez-Mancilla, Room B-104**

- A17-601, Preliminary Analysis for Worn Out Gas Turbine Blade-Vane Components Related to Resonant Mode Frequencies and Fatigue Life Consumption, **J. C. Gómez-Mancilla**, Instituto Politécnico Nacional, México D. F., **L. M. Palacios-Pineda, Y. López-Grijalba, and O. Gutiérrez-Suárez**, Instituto Tecnológico de Pachuca, Pachuca, Hidalgo, México.
- A17-600, Evolution of Rotor Dynamics in 20th Century, **J. S. Rao**, Altair Engineering India, Bangalore, India
- A17-602, Stability Analysis of Hydrodynamic Bearings with a Central Circumferential Feeding Groove, **M. Chouchane, S. Naïmi**, University of Monastir, Monastir, Tunisia, and **J. L. Ligier**, RENAULT S.A, Rueil Malmaison, France.

### **Dynamics of Machinery III, Ch. Prof. T. Majewski, Room B-105**

- A24-453, Resultant Dynamic Force of Automatic Balancing of a Disk with Elastic Shaft, **T. Majewski**, Departament of Mechanical Engineering, Universidad de las Américas, and **M. A. Meraz Melo**, Departament of Mechanical Engineering, Instituto Tecnológico de Puebla, Puebla, México.
- A24-476, Dynamics of the Vibration Driven Tool at Its Interaction with the Processing Material, **S.F. Jatsun, I.V. Lupehina, L. Yu. Volkova**, South-West State University, Kursk, Russia, **G. J. Panovko and A. A. Blagonravov**, Mechanical Engineering Institute RAS, Moscow, Russia.
- A24-593, Dynamic Answer Optimization and Experimental Research Concerning the Mechanisms of Farming Machine, **I. D. Geonea, A. Margine, N. Dumitru**, Craiova University, and **C. Micu**, G.S.I. Transporturi, Craiova, Romania.

### **Robotics and Mechatronics XV, Ch. Prof. A. Raatz, Room B-1**

- A12-499, Advantages of Task-adapted Parallel Robot Systems Featuring Modularity and Reconfigurability, **G. Borchert, A. Burisch and A. Raatz**, Technische Universität Carolo-Wilhelmina, Braunschweig, Germany.
- A12-462, Kinetostatic Analysis of the New Parallel Manipulator with Cylindrical Joints, **Zh. Baigunchekov, B. Nurakhmetov, K. Sartaeov, M. Izmambetov and Zh. Myrzageldieva**, Kazakh-British Technical University, Almaty, Kazakhstan.
- A12-513, Semi-Autonomous Collaborative Mobile Robot System for Material Handling, **V. J. Gonzalez-Villela, A. Angeles-Garcia and D. Lima-Robleda**, Department of Mechatronics Engineering UNAM, CU, Mexico, D.F., Mexico.

### **Robotics and Mechatronics XVI, Ch. Prof. L. Notash, Room A-103**

- A12-491, Investigation of Force Capability in Wire-Actuated Parallel Manipulators for Wire Failure, **M. Agahi and L. Notash**, Queen's University, Kingston, Canada.
- A12-503, Implementation of the Slide-O-Cam mechanism in the Design of a Robot Gripper, **A. Silva-Caballero, M. González-Palacios, L. A. Aguilera-Cortés**, Universidad de Guanajuato, Salamanca, M/éxico.
- A12-523, Shaking Force Balancing of a Redundant Planar 4-RRR Parallel Manipulator by Linear Momentum with the Loop Equations Included, **V. van der Wijk, J. L. Herder**, University of Twente, Enschede, The Netherlands, **S. Krut and F. Pierrot**, LIRMM, Montpellier, France.

### **Computational Kinematics VIII, Ch. Prof. J. Yu, Room A-3**

- A7-367, The Reciprocity of a Pair of Line Spaces, **J. Yu**, Beihang University, Beijing, China, **X. Kong**, Heriot-Watt University, Edinburgh, United Kingdom, **J. B. Hopkins, M. L. Culpepper**, Massachusetts Institute of Technology, Cambridge, USA. **and J. S. Dai**, King's College, Univ. of London, London, UK.
- A7-261, Analysis of Mechanism Structure Using Zero Transformation Parameters, **K. Sholanov**, Kazakh National Technical University, Republic of Kazakhstan.
- A7-570, Serial Kinematic Chains with Unilateral External Force Constraints, **D. Zlatanov**, University of Genoa, Genoa, Italy.

## **Gearings VIII, Ch. Prof. D. Su, Room A-106**

- A9-586, Online Gearbox Condition Monitoring Supported by Wireless Communication Techniques, **D. Su, and W. Peng**, Advanced Design and Manufacturing Engineering Centre, School of Architecture, Design and the Built Environment, Nottingham Trent University, Burton Street Nottingham, NG1 4BU, UK.
- A9-598, Novel Variable-Tooth-Thickness Hob for Longitudinal Crowning in the Gear-Hobbing Process, **R. H. Hsu and Z. H. Fong**, National Chung Cheng University, Chia-Yi, Taiwan.
- A9-318, The Design of Three-speed Front Internal Gear Hub for a Bicycle, **L. C. Hsieh**, Dept. of Power Mechanical Engineering, National Formosa University, and **H. C. Tang**, Institute of Mechanical and Electro-Mechanical Engineering, Yunlin, Taiwan.

## **Linkages and Cams VIII, Ch. Prof. J. L. Herder, Room B-106**

- A11-492, Static Balancing of an Inverted Pendulum with Pre-stressed Torsion Bars, **G. Radaelli, J.L. Herder, TU Delft, R. Buskermolen, HCI, and R. Barents**, InteSpring, Delft, The Netherlands.
- A11-418, Synthesis of Geared Mechanisms for Guidance Tasks Application in Packaging and Spacer Fabric Handling, **U. Hanke, K-H. Modler**, Technische Universität Dresden, Dresden, Germany, and **S. Lin**, CDHK - Tongji University, Shanghai.
- A11-553, Feasibility of Application of Finite Element Analysis Technique to Rigid Body Kinematics of a Mechanism, **J. P. Modak**, Priyadarshini College of Engineering, Near C.R.P.F. Campus, MIDC, Hingna Road, Nagpur, India 440 019.

## **Design Methodology VIII, Ch. Prof. C. López-Cajún, Room A-105**

- A23-537, Durability tests, **J. M. Moisés**, Volkswagen de México, Puebla, México, and **M. T. Jose**, SEPI Zacatenco IPN, DF, México.
- A23-405, 3D Modeling And Motion Anaisys of the Clock Mechanism, **B. Popkonstantinovic, Z. Jeli**, Faculty of Mechanical Engineering, **M. Dimitrijevic, S. Misic**, Faculty of Civil Engineering, Belgrade, Serbia.
- A23-309, Some Considerations About the Modern Role of the Mechanical Historical Heritage, **F. Rosa and E. Rovida**, Politecnico di Milano - Dip.to di Meccanica, Milano, Italy.

## **Rotor Dynamics IV, Ch. Prof. A. Grządziela, Room B-104**

- A17-255. Diagnosing Of Rotor Systems Of Marine Gas Turbine Engines In Nonstationary States, **A. Grządziela**, Polish Naval Academy, Gdynia, Poland.
- A17-572, Modal Analysis in Identification and Diagnostics of Rotating Machinery, **J. Bednarz, T. Barszcz, T. Uhl, and P. Kurowski**, AGH Univeristy Of Science and Technology, Kraków, Poland.

## **Dynamics of Machinery IV, Ch. Prof. J. M. Dorador, Room B-105**

- A24-455, Physical Explanation on Rotational Vibration Via Distorted Force Field of Multicyclic Symmetric Systems, **D. L. Chen, S. Y. Wang, J. P. Liu** School of Mechanical Engineering, Tianjin University, Tianjin, China, **and J. Xiu**, School of Electrical Engineering and Automation, Tianjin University, Tianjin, China.
- A24-269, Vector Cyclegram of Machine-Automaton, **A. Jomartov, G. Ualiyev**, Institute of Mechanics and Mechanical Engineering, Almaty, Republic Kazakhstan.
- A24-413, Kinematical Dynamic Characteristics of a Planetary Differential Mechanism, **V. Merticaru and E. Merticaru**, Technical University “Gh. Asachi”, Iasi, Romania.

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Tuesday, June 21

17:20-18:20

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## **Robotics and Mechatronics XVII, Ch. Prof. Y. Nakamura, Room B-1**

- A12-534, Mechanism and Control of Knee Power Augmenting Device with Backdrivable Electro-Hydrostatic Actuator, **H. Kaminaga, H. Tanaka and Y. Nakamura**, The University of Tokyo, Tokyo, Japan.
- A12-516, Optimal Continuous Trajectory in Parallel Manipulators with Minimum Energy, **A. Rojas Salgado and R. Terrazas Mallea**, UNAM, DF, Mexico.
- A12-542, Quasi-Static Simulation of a Wheeled Mobile Robot Having a Passive Variable Camber, **V. Eathakota, G. Aditya and M. Krishna**, RRC, IIIT-H, Hyderabad, India.

## Robotics and Mechatronics XVIII, Ch. Prof. I. A. Tabără Room A-103

- A12-531, Determination of the Positioning Errors of the Robot Due to the Influence of Misalignments of the Revolute Joints Axes, **I. A. Tabără, V. Moise, I. Dugășescu and L. Ioniță**, University Politehnica, Bucharest, Romania.
- A12-539, Kinematic Analysis and Computation of ZMP for a 12-internal-DoF Biped Robot, **O. Narvez-Aroche, E. Rocha-Cózatl and F. Cuenca-Jiménez**, National Autonomous University of Mexico, Mexico City, Mexico.
- A12-568, A Novel Type of 5 DOF Parallel Micromanipulator with Piezoelectric Actuators, **D. Prusak, G. Karpel and T. Uhl**, AGH-UST, Krakow, Poland.

## Computational Kinematics IX, Ch. Prof. A. Veg, Room A-3

- A7-613, Computer Aided Balancing (CAB) Applied on an Orbiting Mechanism, **A. Veg, G. Sinikovic, R. Andrejevic and E. Veg**, University of Belgrade, Faculty of M. E., Belgrade, Serbia.
- A17-484, Analysis of a Spatial Tensegrity-based Compliant Mechanism, **Y. Moon, C.D. Crane III** University of Florida, Gainesville, FL USA, **and R. Roberts**, Florida State University, Tallahassee, FL USA.
- A7-340, Mechanical Design and Kinematics Simulation for a Power Wheelchair with Self-actuated Seating Functions, **J. G. Zhang, F. Wang, Q. Xue, Y. P. Guo and Y. Ren**, College of Mechanical Engineering, Tianjin University of Science and Technology, Tianjin, China.

## Linkages and Cams IX, Ch. Prof. C. Nelson, Room B-106

- A11-518, A Case Study of Designing a Cam-Follower Mechanism with Cycloidal Motion, **A. Pourghodrat and C. A. Nelson**, University of Nebraska-Lincoln, Nebraska, USA.
- A11-520, Bendable 9-Faced Polyhedra: Generation, Classification and Application, **M. Hamann, G. Weiss**, Faculty of Mathematics and Natural Sciences, Dresden University of Technology, Dresden, **N. Posselt, K. H. Modler**, Faculty of Mechanical Engineering, Dresden University of Technology, Dresden, Germany, **and S. Lin**, Department of Mechanical Engineering and Automobile, Tongji University, Shanghai, China.
- A11-554, Determination of the Minimum Size of the Disk Cam with Translating Flat-Face Follower, **V. Moise, I. A. Tabara, I. Dugaesescu**, University Politehnica, Bucharest, Romania, **and M. Ene**, University Quebec, Quebec, Canada.

## Multibody Dynamics I, Ch. Prof. A. Kecskemethy, Room A-105

- A8-530, Time-Optimal Motion Planning Along Specified Paths for Multibody Systems Including Dry Friction and Power Constraints, **F. Geu Flores and A. Kecskemethy**, Lehrstuhl für Mechanik und Robotik Universität Duisburg-Essen, Duisburg, Germany.
- A8-497, Scaling Kinematic Chains in the Air -Identification of Floating Systems Using Dynamics Constraint of the Baseline without Force Measurement-, **K. Ayusawa, Y. Nakamura**, University of Tokyo, **and G. Venture**, The Tokyo University of Agriculture and Technology, Japan.
- A8-564, Optimization in Dynamic Regime of a Francis Hydraulic Turbine Wicket Gate Mechanism, **N. Dumitru, R. Malciu, S. Dumitru and A. Margine**, University of Craiova, Craiova, Romania.

## History of Mechanism and Machine Science I, Ch. Prof. H. Kerle, Room B-105

- A21-279, Historical Remarks on Past Model Collections of Machines and Mechanisms in Europe, **H. Kerle**, Technical University, Braunschweig, Germany, **K. Mauersberger**, Technical University, Dresden, Germany, **and M. Ceccarelli**, University of Cassino, Cassino, Italy.
- A21-357, A Note on the Mechanics of Ancient Gear Systems, **F. Sorge**, University of Palermo, Palermo, Italy.
- A21-393, Mechanism Designs of Cultural Heritage, **M. Ceccarelli**, LARM at University of Cassino, Cassino, Italy.

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Wednesday, June 22

9:00-10:00

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Conference Hall

Keynote Lecture 3, Ch. Prof. José M. Rico

The Task Selection Problem in the Kinematic Synthesis of Linkages  
**Prof. Michael McCarthy**, University of California-Irvine, USA.

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Wednesday, June 22

10:00-11:40

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### **Robotics and Mechatronics XIX, Ch. Prof. M. Hiller, Room B-1**

- A12-538, Optimization of the Wire Length for a Skid Actuated Wire Based Parallel Robot, **C. Sturm, T. Bruckmann, D. Schramm and M. Hiller**, University Duisburg-Essen, Duisburg, Germany.
- A12-552, Thermoelectric Energy Harvester for a Smart Bearing Concept, **T. J. Uhl and M. L. Lubieniecki**, University of Science and Technology, Cracow, Poland.
- A12-562, Simulation and Experimentation of Walking of the Bioloid Humanoid Robot, **V. Nuñez, L. I. Olvera and J. A. Pamanes**, División de Estudios de Posgrado e Investigación, Instituto Tecnológico de la Laguna, Torreón, Coah. México.
- A12-573, 3D Objects Grasps Synthesis: A Survey, **S. El-Khoury**, Scuola Superiore Sant'Anna, Percro - Pisa, Italy, **A. Sahbani and P. Bidaud**, Pierre & Marie Curie University, Paris, ISIR-CNRS, France.
- A12-259, Stabilizing Role of Feet in Walking Machines, **T. Zielinska**, Warsaw University of Technology, Institute of Aeronautics and Applied Mechanics (WUTIAAM), ul. Nowowiejska, 24, 00-665 Warsaw, Poland.

### **Robotics and Mechatronics XX, Ch. Prof. I. Ion, Room A-103**

- A12-563, Elastic Systems for Static Balancing of Robot Arms, **I. Simionescu, L. Ciupitu, Luciana Ionita, I. Ion**, Politehnica University, Bucharest, Romania, and **M. Ene**, University of Quebec, Quebec, Canada.
- A12-347, An Approach for Stiffness Modelling of Lower Mobility Parallel Manipulators using the Generalized Jacobian, **H. T. Liu, T. Huang**, Tianjin University, Tianjin, China, **Y. G. Li**, Tianjin University of Technology and Education, Tianjin, China, and **D. G. Chetwynd**, The University of Warwick, Coventry, UK.

- A12-487, Semi-global Output Feedback Asymptotic Tracking for an Under-actuated Variable Stiffness Mechanism, **O. M. Anubi and C. Crane**, Center for Intelligent Machines and Robotics, University of Florida, Gainesville, FL USA.
- A12-359, A Novel 6 dof Parallel Robot With Decoupled Translation and Rotation, **E. Yime**, Universidad Tecnológica de Bolívar, Campus Tecnológico de Ternera, Cartagena de Indias, Colombia, **H. Moreno and R. Saltarén**, Universidad Politécnica de Madrid, Calle José Gutierrez Abascal, 2, 28006. Madrid, Spain.
- A12-410, Pose Accuracy Analysis of Master Slave Surgical Robot System, **J. Y. Zhang, C. Zhao and D. W. Zhang**, Tianjin University, Tianjin, China.

### **Multibody Dynamics II, Ch. Prof. J. Ambrósio, Room B-106**

- A8-585, Contact Mechanics In A Roller Chain Drive Using A Multibody Approach, **C. Pereira**, ISEC Polytechnic, Coimbra, Portugal, **J. Ambrósio**, IDMEC-IST, Lisbon, Portugal, **and A. Ramalho**, CEMUC-FCTUC, Coimbra, Portugal.
- A8-263, Contact Prediction Between Moving Objects Bounded by Curved Surfaces, **A. Albedah**, King Saud University, Riyadh, Saudi Arabia, **and J. J. Uicker**, University of Wisconsin, Madison, Wisconsin, USA.
- A8-301, On the Motion of the Rigid with Points Forced to Move on Given Fixed Surfaces, **S. Ogaru and N. D. Stănescu**, University of Pitești, Pitești, Romania.
- A8-496, A General Contact Algorithm for Multibody System Dynamics with Complex Non-conforming 3D Geometry, **D. Dopico, A. Luaces, J. Lujris and J. Cuadrado**, Universidad de la Coruña, Ferrol, Spain.
- A8-448, Elasto-Dynamic Modeling of a Novel High-Speed Parallel Manipulator with String-Parallelogram Mechanism, **T. Sun, Y. Song, K. Yan and G. Dong**, Tianjin University, Tianjin, P. R. China.

### **History of Mechanism and Machine Science II, Ch. Prof. H. S. Yan, Room B-105**

- A21-271, Ancient Mechanical Horse Carriages: from Basic Research to Science Education in Museums, **H. S. Yan**, National Cheng Kung University, Tainan, Taiwan.
- A21-475, Creating Present-Day Solutions from Historical Knowledge, **T. Brix, U. Döring and M. Reefing**, Ilmenau University of Technology, Ilmenau, Germany.
- A21-397, Ivan Ivanovich Artobolevski as one of the Founders of IFToMM, **O. Egorova**, Moscow State Open University, Moscow, Russia, **and M. Ceccarelli**, DiMSAT, University of Cassino, Cassino, Italy.

- A21-356, Development of a Foldable Maritime Container, **A.J. Klein Breteler**, Technical University Delft, Delft, the Netherlands.
- A21-597, Considerations About Some Applications of “Simple Machines”, **S. M. Cretu, L. Suci**, University of Craiova, Craiova, Romania, **and G. C. Brinzan**, “Fratii Buzesti” National College, Craiova, Romania.

### **Tribology I, Ch. Prof. E. Ciulli, Room A-3**

- A19-504, Dynamic Aspects of a New Experimental Apparatus for Tribological Investigations on Cam-Follower Pairs, **D. Vela, F. Fazzolari and E. Ciulli**, University of Pisa, Pisa, Italy.
- A19-526, Interface Mass Trasfer During the Tribofinishing Process, **I. Hilerio and M. Barrón**, Universidad Autónoma Metropolitana, Distrito Federal, México,
- A19-527, Wet and Dry Abrasion Behavior of AISI 8620 Steel Boriding, **I. Hilerio**, Universidad Autónoma Metropolitana, Distrito Federal, México.
- A19-262, Evaluation of Surface Fatigue Life and Durability Using D-value and Hardness, **A. Yoshida**, Hiroshima International University, Hiroshima, Japan, **M. Seki, M. Fujii**, Okayama University, Okayama, Japan, **and K. Fukuhara**, IAV GmbH, Berlin, Germany.
- A19-362, General Static Load Capacity in Four Contact Point Slewing Bearings. Theoretical and Finite Element Calculations, **J. Aguirrebeitia, M. Abasolo, R. Aviles and I. Fernandez**, ETSIB, UPV/ EHU, Bilbao, Spain.

### **Education I, Ch. Prof. P. Fanghella, Room A-106**

- A20-443, Education in Mechatronic Engineering - Italian perspective, **Pietro Fanghella**, DIMEC - University of Genoa, Genoa, Italy.
- A20-548, The Spherical Four-Bar Mechanism: Optimum Synthesis with DE Algorithm and Animation Using Mathematica, **R. Peón-Escalante, C. Villanueva, and F. Peñuñuri**, Universidad Autonoma de Yucatán, Mérida, México.
- A20-551, Robotics Engineering at the Universidad Politécnica de Guanajuato, Applied Educational Innovation, **A. Cruz-Bernal and E. Chávez Conde**, Departamento de Ingeniería Robótica, Universidad Politécnica de Guanajuato, Cortázar, Gto. México.
- A20-345, Development of the Waseda Wheeled Robot No. 2 Refined II and Pilot Experiments with Undergraduate Students, **J. Solis and A. Takanishi**, Waseda University, Tokyo, Japan.

## **Sustainable Energy Systems I, Ch. Prof. R. Balan, Room A-105**

- A29-592, Advanced Control Algorithms for Energy Efficiency and Comfort Inside a House, **R. Balan, S. Stan, V. Maties, R. Donca and M. Vlad**, Technical University of Cluj-Napoca, Cluj-Napoca, Romania.
- A29-599, Modeling and Control of Variable Speed Wind Turbine Equipped with PMSG, **D. I. Stroe, A. I. Stan**, Aalborg University, Aalborg, Denmark, **I. Visa and I. Stroe**, Transilvania University, Brasov, Romania.
- A29-579, Mechanism to Control Power in Small Wind Turbines, **G. Muñoz-Hernández and M. Martínez-Jiménez**, CIATEQ A.C., Querétaro, México.
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