



6th IFTOMM Symposium on Mechanism Design for Robotics,
Timișoara, Romania, June 27-29, 2024

Mechanism Design for Robotics

MEDER 2024

Conference Program

Organized by:

Politehnica University of Timișoara
Faculty of Mechanical Engineering
Department of Mechatronics

with organizing support of:

ARoTMM – Romanian Association of Mechanism and Machine Science
ASTR – Technical Sciences Academy of Romania
SRR – Robotics Society of Romania

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Volume Editors:

Ceccarelli, Marco
University of Rome Tor Vergata, Dept. of Industrial Engineering, Roma, Italy
Lovasz, Erwin-Christian
University Politehnica Timisoara, Dept. of Mechatronics, Timișoara, Romania
Ciupe, Valentin
University Politehnica Timisoara, Dept. of Mechatronics, Timișoara, Romania

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Sandu, Melania Olivia

Thursday, June 27th 2024

09:00-09:30 UPT conference center,
2nd floor, hallway Registration of
participants

MEDER 2024 Conference Opening Ceremony

09:30-10:00 Room K1

Invited Keynote Speaker

10:00-10:30 Room K1

Marco Ceccarelli: Challenges with MEDER conference

Parallel technical sessions

Mechanism education and history of MMS

10:30-11:30 Room K1 Chairperson:
Eiichiro Tanaka

Paper ID	Title	Authors
001	Lab Experiences with 5R mechanisms for teaching	<i>Ceccarelli, Marco, Russo, Matteo, Silva, Karla, Sanz, Susana</i>
004	Kinematic Reliability of Manipulators Subjected to Clearances Using an Interval Approach	<i>Molina, Fabian, Sales Gonçalves, Rogério, Ceccarelli, Marco</i>
041	Contributions to the development of networked integration of mobile robots for emergency situations	<i>Tatar, Mihai-Olimpiu, Maries, Marco</i>

Mechanics of robots

10:30-11:30 Room K2 Chairperson:
Kenji Hashimoto

Paper ID	Title	Authors
025	Stiffness Evaluation and Dimensional Synthesis of a 5-DOF Parallel-Serial Robot	<i>Antonov, Anton</i>
029	A Preliminary Study on 3D Tracking of an Untethered Microrobot	<i>Uslu, Tugrul, Gezgin, Erkin</i>
020	MELEW-3: Quadruped-Wheeled Robot with 4-DoFs and an Active Wheel on One Leg	<i>Yamano, Junsei, Suzuki, Taisei, Nakahara, Takatoshi, Kasahara, Yoshinobu, Hashimoto, Kenji</i>

11:30-11:50 Hallway Coffee break

Parallel technical sessions

Linkages and manipulators 1/2

11:50-13:30

Room K1

 Chairperson:
Burkhard Corves

Paper ID	Title	Authors
011	Design and Stiffness Modeling of A Novel Planar Parallel Robot with Variable Stiffness Actuators	<i>Majumder, Arunabha, Kiziloklu, Ibrahim Doruk, Oliveira, Anderson Souza, Bai, Shaoping</i>
012	Consistent Model Descriptions for the Visualization and Simulation of a Reconfigurable Parallel Kinematic Structure in ROS2	<i>Wiertalla, Jan, Yan, Yicheng, Hüsing, Mathias, Corves, Burkhard</i>
021	Kinematic aspects and geometric modeling for the legs of a hexapod robot intended for laboratory experiments	<i>Nitulescu, Mircea</i>
034	Preliminary design and analysis of the 3-UCU parallel mechanism	<i>Bouzgarrou, Chedli, Arrouk, Khaled Assad</i>
002	Design and Testing of An Underactuated Finger with Compliant Elements	<i>Ceccarelli, Marco, Yamamoto, Takumi, Iwatsuki, Nobuyuki</i>

Biomechanics and Rehabilitation 1/3

11:50-13:30

Room K2

 Chairperson:
Kazuyoshi Ishida

Paper ID	Title	Authors
006	A PK platform lab test for a brain neurosurgery	<i>Silva, Karla, Russo, Matteo, Torres-San Miguel, Christopher René, Guerrero-Hernández, Luis Angel, Ceccarelli, Marco</i>
017	A Novel Design and Simulation of Knee Joint for Humanoid Robot with Variable Output Torque	<i>Zhang, Chenrui, Gao, Huang, Ceccarelli, Marco</i>
022	Results and problems from lab testing with L-CADEL.v3	<i>Ceccarelli, Marco, Kotov, Sergei, Russo, Matteo</i>
015	Development of a Rehabilitation Robot for a Frozen Shoulder Considering a Shoulder Girdle Motion	<i>Sun, Xiao, Makino, Koji, Kurita, Kazuki, Kaneko, Hiromi, Ishida, Kazuyoshi, Terada, Hidetsugu</i>
019	Wrist Exoskeleton actuated by a Parallel Manipulator	<i>Craciun, Narcis-Gratian, Tulcan, Elida-Gabriela, Ceapa, Cristian, Lovasz, Erwin-Christian</i>

13:30-15:00

Hallway

Lunch

Parallel technical sessions

Experimental mechanics

15:00-16:20 Room K1 Chairperson:
Lorenzo Scalera

Paper ID	Title	Authors
005	Experimental analysis and comparison of friction models applied to the UR5e robot	<i>Fabris, Giuliano, Scalera, Lorenzo, Boscarior, Paolo, Gasparetto, Alessandro</i>
033	An experimental characterisation of developed knee joint mechanism prototypes	<i>Olinski, Michał</i>
039	Experimental Approach of the Pressing Force for Robotic Pipetting in Automated PCR (Polymerase Chain Reaction)	<i>Sandu, Melania Olivia, Gruescu, Corina, Kristof, Robert, Sticlaru, Carmen, Ciupe, Valentin, Lovasz, Erwin-Christian</i>

Biomechanics and Rehabilitation 2/3

15:00-16:20 Room K2 Chairperson:
Ming Jiang

Paper ID	Title	Authors
023	Design and Prototyping of a Hand Exoskeleton for Finger Rehabilitation by Driving Distal Phalanx	<i>Jiang, Ming, Cao, Lei, Meng, Qizhi, Parenti-Castelli, Vincenzo, Sugahara, Yusuke, Takeda, Yukio</i>
024	Numerical Optimizations in Inverse Kinematics of Robotics Hand	<i>Fonte, Cosimo, Cocconcelli, Marco, Ceccarelli, Marco</i>
036	Ankle assisting device for walking	<i>Tanaka, Eiichiro, Osawa, Keisuke, Wu, Xiu-Yuan, Wang, Chang-Wen, Wang, Yuntian, Nakagawa, Kei, Ceccarelli, Marco</i>
026	Mechanical Design of a 3-DOF Kinematic-Biological Matched Hip Joint Structure for Lower Limb Exoskeleton	<i>Wang, Yuntian, Wu, Xiuyuan, Fang, Yifan, Osawa, Keisuke, Nakagawa, Kei, Yamasaki, Shintaro, Tanaka, Eiichiro</i>

18:00-22:00 The Beer Garden Dinner

Friday, June 28th 2024

Parallel technical sessions

Linkages and manipulators 2/2

09:00-10:40 Room K1 Chairperson:
Cristian Moldovan

Paper ID	Title	Authors
018	Analytical Synthesis of the Seven-Bar Linkage 7-PR(RRRR)RP used for Medical Disinfection Robot	<i>Tulcan, Elida-Gabriela, Oarcea, Alexandru, Sticlaru, Carmen, Ceccarelli, Marco, Lovasz, Erwin-Christian</i>
028	Leveraging Machine Learning for Terrain Traversability in Mobile Robotics	<i>Cottiga, Simone, Bonin, Lorenzo, Giberna, Marco, Caruso, Matteo, Goerner, Martin, Carabin, Giovanni, Scalera, Lorenzo, De Lorenzo, Andrea, Seriani, Stefano</i>
031	Type Synthesis and Kinematic Analysis of a 4R1H Screw-lever Linkage	<i>Fomin, Alexey</i>
032	Kinematic analysis of the 4-U(RPRGR)RU redundant parallel robot	<i>Oarcea, Alexandru, Tulcan, Elida-Gabriela, Buncianu, Dorel, Lovasz, Erwin-Christian</i>
038	Structural- parametric synthesis of planar motion generating mechanisms and manipulators	<i>Baigunchekov, Zhumadil, Laribi, Amine, Carbone, Giuseppe, Xuelin, Wang, Kaiyrov, Rustem, Dosbossyn, Anar, Qian, Li</i>

Biomechanics and Rehabilitation 3/3

09:00-10:40 Room K2 Chairperson:
Ionut Daniel Geonea

Paper ID	Title	Authors
027	Utilization of Kinematic Synthesis Methodology on a Novel Polycentric Mechanism for Transfemoral Knee Prosthesis	<i>Koçak, Mertcan, Gezgin, Erkin</i>
040	Structural Solutions of Walking Mechanisms intended to Exoskeleton Robots to Assist Human Gait	<i>Geonea, Ionut Daniel, Dumitru, Nicolae, Dumitru, Sorin, Copilusi, Cristian, Tarnita, Daniela</i>
044	Control Advances in Upper Limb Prostheses: A Review. Part I: Invasive Methods	<i>Cazacu, Cristina-Magda, Doroftei, Ioan</i>

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045	Control Advances in Upper Limb Prostheses: A Review. Part II: Non-Invasive Methods	<i>Cazacu, Cristina-Magda, Doroftei, Ioan</i>
047	Kinematic model of a new hybrid soft robotic hand exoskeleton	<i>Birouas, Flaviu Ionut, Tarca, Ioan Constantin, Tarca, Radu Catalin</i>

10:40-11:00 Hallway Coffee Break

Parallel technical sessions

Mechanism design

11:00-13:00	Room K1	Chairperson: <i>Erkin Gezgin</i>
Paper ID	Title	Authors
014	Methodological Joint Distribution for Platform Type Manipulator Topologies	<i>Yazıcı, Mustafa Volkan, Koçak, Mertcan, Uslu, Tugrul, Gezgin, Erkin</i>
042	Unveiling the Potential of Modular Mobile Robotic Systems. A Review	<i>Baneasa, Andrei, Buleandra, Debora-Gabriela, Tatar, Mihai-Olimpiu, Donca, Radu-Calin</i>
043	Noncircular cable-pulley mechanisms used for equilibrating the wheelchair backrest	<i>Popescu, Ioan-Emil, Florescu, Florin, Moldovan, Cristian, Buncianu, Dorel, Tulcan, Elida-Gabriela, Lovasz, Erwin-Christian</i>
046	Assembling Modes of a 3-RRR Planar Mechanism and its Workspace Analysis	<i>Buium, Florentin, Doroftei, Ioan, Alaci, Stelian</i>
007	Actuation along a single linear axis: the kinematics of the single-rail Tripteron	<i>Boscarior, Paolo, Tamellin, Jacopo</i>
008	Design, Analysis and Prototype a Novel Two-limb 3R1T Parallel Robot with Remote Centre of Motion	<i>Yao, Ruihan, Craig, Andrew, Jian, Yinglun, McAleenan, Aislinn, Wei, Chongfeng, Sun, Dan, Mooreb, Johnny, Jin, Yan</i>

Innovative mechanisms/robots and their applications

11:00-13:00	Room K2	Chairperson: <i>Carl Nelson</i>
Paper ID	Title	Authors
003	An Improved Mechanism for Rotational Variable Stiffness	<i>Nelson, Carl</i>
030	Path Optimization of a Collaborative Four-Bar Mechanism with an Elastic Coupler	<i>Selvi, Ozgun, Gezgin, Erkin</i>
035	Design of a Pick-and-Place Mechanism for a Filter Bag-forming Machine	<i>Chen, Yu-Hsun, Wang, Sin-Yi, Ceccarelli, Marco</i>

010	An Integrated Application for the Investigation of Energy-Efficient, Non-Uniformly Translating Mechanisms	<i>Knobloch, Thomas, Corves, Burkhard, Hüsing, Mathias, Freiwald, Luca</i>
013	Digital Twin-oriented kinematic modelling of a large-sized mesh welding plant for productivity evaluation: a company case study	<i>Nezzi, Chiara, Fink, Stefan, Rauch, Erwin, Vidoni, Renato</i>
037	The control architecture of a spherical robot for Minimally Invasive Surgery	<i>Rus, Gabriela, Al Hajar, Nadim, Tucan, Paul, Zima, Ionut, Ciocan, Andra, Vaida, Calin, Radu, Corina, Chablat, Damien, Pisla, Doina</i>

13:00-15:00	Venue site	Lunch and meeting of ISC for MEDER
17:00-22:00	Recas Vineyards Organized bus travel	Gala dinner with award ceremony + wine tasting

Saturday, June 29th 2024

09:00-18:00	Excursion to Corvins' Castle	Extra fee
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EN: Conference Center of Politehnica University of Timișoara

RO: Centrul de Conferințe al Universității Politehnica Timișoara



 **ON MAP:**

