



# 5th IFTToMM Symposium on Mechanism Design for Robotics MEDER 2021

June 23-25, 2021  
Futuroscope - Poitiers, France

## MEDER 2021, PROGRAM OVERVIEW

5th IFTToMM Symposium on Mechanism Design for Robotics - MEDER2021

### Program

Hour	Wednesday	Thursday	Friday
	23/06/2021	24/06/2021	25/06/2021
8:30		<b>S3: Linkage and manipulators</b>  ID: 015 - 018 - 019 - 028 - 029	<b>Keynote Lecture</b>  <i>Xavier Bonnet</i>
9:00			
10:10		<i>Coffee-break</i>	
10:10 - 10:25		<b>S4: Parallel manipulators</b>  ID: 001 - 023 - 033 - 035 - 011	<b>S7: Special session in honor of prof. Said Zegloul</b>  ID: 004 - 016 - 020 - 031
10:25			
12:05		<b>Meeting of the MEDER ISC</b>	
12:05 - 13:00		<b>Awards &amp; Closing Session</b>	
		<b>Lunch</b>	
14:00	<b>Opening Session</b> <b>Keynote Lecture</b>  <i>Philippe Wenger</i>	<b>S5: Innovative mechanism/robot and their applications</b>  ID: 009 - 010 - 025 - 032 - 006	
14:20			
14:30			
15:30		<i>Coffee-break</i>	
15:30 - 15:45		<i>Coffee-break</i>	
15:45 - 16:00			
17:05	<b>S1: Mechanics of robots</b>  ID: 012 - 013 - 022 - 036	<b>S6: Mechanism design</b>  ID: 002 - 008 - 021 - 024 - 027 - 034 - 037	
17:05 - 17:20	<i>Coffee-break</i>		
17:20			
18:20	<b>S2: Actuators and control</b>  ID: 007 - 014 - 030 - 038		
18:40			

# MEDER 2021, DETAILED PROGRAM

**WEDNESDAY 23.06.2021**

## **15:45 – 17:05** ■ **SESSION 1: MECHANICS OF ROBOTS**

CHAIRER BY: GIUSEPPE CARBONE

- ID-012 **DESIGN OF A FLEXIBLE INTERPHALANGEAL JOINT**  
*JOB ELI ESCOBAR-FLORES, CHRISTOPHER TORRES SAN MIGUEL, LUIS ANTONIO AGUILAR, MARCO CECCARELLI*
- ID-013 **AERODYNAMIC DOUBLE PENDULUM WITH NONLINEAR ELASTIC SPRING**  
*YURY SELYUTSKIY, MARAT DOSAEV, ANDREI HOLUB, MARCO CECCARELLI*
- ID-022 **DESIGN OF A RECONFIGURABLE NOVEL CONSTANT-FORCE MECHANISM FOR ASSISTIVE EXOSKELETONS**  
*YICHEN LIU, ZHONGYI LI, SHAOPING BAI*
- ID-036 **DESIGN CRITERIA STUDY FOR UNDERACTUATED SYMMETRIC PINCHING MECHANISM OF PINCH ROLL MACHINE IN HIGH-SPEED WIRE ROD PRODUCT LINE**  
*WANG RENQUAN, SHUANGJI YAO, MARCO CECCARELLI*

## **17:20 – 18:40** ■ **SESSION 2: ACTUATORS AND CONTROL**

CHAIRER BY: SHAOPING BAI

- ID-007 **MOTION CONTROL OF 6-DOF RELATIVE MANIPULATION DEVICE**  
*SERGEY KHALAPYAN, LARISA RYBAK, ELENA GAPONENKO, GIUSEPPE CARBONE*
- ID-014 **CONTROL OF THE VIBRATIONS OF A CARTESIAN AUTOMATIC MACHINE**  
*MATTEO BOTTIN, GIULIO CIPRIANI, DOMENICO TOMMASINO, ALBERTO DORIA*
- ID-030 **GENETIC ALGORITHM WITH ITERATIVE LEARNING CONTROL FOR ESTIMATION OF THE PARAMETERS OF ROBOT DYNAMICS**  
*KALOYAN YOVCHEV, LYUBOMIRA MITEVA*
- ID-038 **MOBILE MANIPULATOR AND EOAT FOR IN-SITU INFECTED PLANT REMOVAL**  
*TAHER DEEMYAD, ANISH SEBASTIAN*

**THURSDAY 24.06.2021**

## **8:30 – 10:10** ■ **SESSION 3: LINKAGE AND MANIPULATORS**

CHAIRER BY: STÉPHANE CARO

- ID-015 **ANALYTICAL MOVEMENT OPTIMIZATION OF DUAL-ARM PLANAR ROBOTS WITH ROTATING PLATFORM**  
*MATTEO BOTTIN, GIULIO ROSATI, GIOVANNI BOSCHETTI*
- ID-018 **INVERSE KINEMATICS AND VELOCITY ANALYSIS OF A 6-DOF HEXAPOD-TYPE MANIPULATOR WITH A CIRCULAR GUIDE**  
*ALEXEY FOMIN, ANTON ANTONOV, DANIIL PETELIN, VICTOR A. GLAZUNOV, MARCO CECCARELLI*
- ID-019 **TORQUE MINIMIZATION OF DYNAMICALLY DECOUPLED R-R SPATIAL SERIAL MANIPULATORS VIA OPTIMAL MOTION CONTROL**  
*YAODONG LU, VIGEN ARAKELYAN*
- ID-028 **KINEMATIC ANALYSIS OF A COAXIAL 3-RRR SPHERICAL PARALLEL MANIPULATOR BASED ON SCREW THEORY**  
*ALEJANDRO CRUZ-REYES, MANUEL ARIAS-MONTIEL, RICARDO TAPIA*
- ID-029 **A NOVEL DESIGN FOR AN AUTONOMOUS MOBILE AGRICULTURAL FRUIT HARVESTING ROBOT**  
*DIVYANSH KHARE, SANDRA CHERUSSERY, SANTHAKUMAR MOHAN*

## **10:25 – 12:05** ■ **SESSION 4: PARALLEL MANIPULATORS**

CHAIRER BY: VIGEN ARAKELYAN

- ID-001 **A COMPARISON OF ALGEBRAIC AND ITERATIVE PROCEDURES FOR THE GENERATION OF THE WORKSPACE OF PARALLEL ROBOTS**  
*MATTEO RUSSO, MARCO CECCARELLI*
- ID-023 **INVESTIGATION OF INTERFERENCE-FREE WORKSPACE OF A CARTESIAN (3-PRRR) PARALLEL MANIPULATOR**  
*ISAAC JOHN, PARVATHI SUNILKUMAR, SANTHAKUMAR MOHAN, LARISA RYBAK*
- ID-033 **EXIT POINT, INITIAL LENGTH AND POSE SELF-CALIBRATION METHOD FOR CABLE-DRIVEN PARALLEL ROBOT**  
*BOZHAO WANG, STÉPHANE CARO*
- ID-035 **KINEMATIC SIMULATION OF A GEARED PLANAR PARALLEL MANIPULATOR**  
*ANTONIO-MARIUS-FLAVIUS LUPUTI, ERWIN-CHRISTIAN LOVASZ, MARCO CECCARELLI, STICLARU CARMEN, ANA-MARIA STOIAN*

ID-011 **INVERS KINEMATICS AND WORKSPACE OF A 3- PRRS TYPE PARALLEL MANIPULATOR**  
ZHUMADIL BAIGUNCHEKOV, MED AMINE LARIBI, RUSTEM KAIYROV, ERNAR ZHOLDASSOV

**14:00 – 15:45 ■ SESSION 5: INNOVATIVE MECHANISM/ROBOT AND THEIR APPLICATIONS**

CHAired BY: EDUARDO CASTILLO

- ID-009 **AN EXTENDABLE CONTINUUM ROBOT ARM TO DEAL WITH A CONFINED SPACE HAVING DISCONTINUOUS CONTACT AREA**  
DAISUKE MATSUURA, RYOTA SHIOYA, HARRY ASADA, YUKIO TAKEDA
- ID-010 **OPTIMAL DESIGN OF A FIVE-BAR MECHANISM DEDICATED TO ASSISTING IN THE FINGERS FLEXION-EXTENSION MOVEMENT**  
ARACELI ZAPATERO, MED AMINE LARIBI, EDUARDO CASTILLO
- ID-025 **DESIGN OF THE 2 D.O.F COMPLIANT POSITIONING DEVICE BASED ON THE STRAIGHT-LINE WATT'S MECHANISMS**  
JAROSLAV HRICKO, STEFAN HAVLIK
- ID-032 **NEW VARIABLE STIFFNESS JOINT: STUDY AND SIMULATION**  
MARIA GUADALUPE CONTRERAS CALDERON, MED AMINE LARIBI, EDUARDO CASTILLO
- ID-006 **SYMBOLIC KINEMATICS OF SPECIAL 3-RSR PARALLEL MECHANISM WITH ZERO COUPLING DEGREE**  
HUIPING SHEN

**16:00 – 18:20 ■ SESSION 6: MECHANISM DESIGN**

CHAired BY: YUKIO TAKEDA

- ID-002 **A RECONFIGURABLE UNDERACTUATED GRASPER WITH IN-HAND MANIPULATION**  
CARL NELSON
- ID-008 **DESIGN OF A ROBOTIC BRACE WITH PARALLEL STRUCTURE FOR SPINE DEFORMITIES CORRECTION**  
RAHUL RAY, GERARD POISSON, LAURENCE NOUAILLE, LAURINE CALISTRI, BRIAC COLOBERT
- ID-021 **DESIGN AND ANALYSIS OF A DEVICE FOR ENLARGING THE ALLOWABLE POSITION ERROR FOR SCREWING TASK**  
HAO-TIEN KU, YU-HSUN CHEN
- ID-024 **AN ADAPTIVE DRIVE OF SPACECRAFT DOCKING MECHANISM**  
KONSTANTIN IVANOV, DANA TULEKENOVA, MARCO CECCARELLI
- ID-027 **SYNTHESIS OF A FUNCTION GENERATOR SIX-BAR LINKAGE IN TWO STEPS WITH GENETIC ALGORITHM**  
CLAUDIO NABIL VILLEGAS ULLOA, BURKHARD CORVES, MATHIAS HÜSING
- ID-034 **DIMENSIONAL SYNTHESIS OF A FOUR-BAR LINKAGE ASSESSING THE PATH AND REFORMULATING THE ERROR FUNCTION**  
ALFONSO HERNANDEZ, AITOR MUÑOYERRO, MÓNICA URIZAR, VICTOR PETUYA
- ID-037 **DRIVING MECHANISM IN ROBOTIZED HOSPITAL BED FOR PATIENTS WITH COVID 19**  
MARCO CECCARELLI, JORGE ENRIQUE ARAQUE ISIDRO

**FRIDAY 25.06.2021**

**10:25 – 12:05 ■ SESSION 7: SPECIAL SESSION IN HONOR OF PROF. SAÏD ZEGHLOUL**

CHAired BY: MARCO CECCARELLI

- ID-004 **DESIGN OF AN 8-DOF REDUNDANT ROBOTIC PLATFORM FOR MEDICAL APPLICATIONS**  
ELIE GAUTREAU, AURÉLIEN THOMAS, JUAN SANDOVAL, MED AMINE LARIBI, SAÏD ZEGHLOUL
- ID-016 **SERIAL APPROACH FOR SOLVING THE FORWARD KINEMATIC MODEL OF THE DELTA ROBOT**  
MAJDI MESKINI, HOUSSEM SAAFI, MED AMINE LARIBI, ABDELFATTAH MLIKA, MARC ARSICAULT, SAÏD ZEGHLOUL
- ID-020 **ON THE OPTIMAL DESIGN OF LAWEX FOR A SAFE UPPER ARM REHABILITATION EXERCISING**  
INES BEN HAMIDA, MED AMINE LARIBI, ABDELFATTAH MLIKA, LOTFI ROMDHANE, SAÏD ZEGHLOUL, GIUSEPPE CARBONE
- ID-031 **A RECONFIGURABLE 6-DOF CABLE-DRIVEN PARALLEL ROBOT WITH AN EXTENDED ROTATIONAL WORKSPACE**  
FERDAWS ENNAIEM, ABDELBADIA CHAKER, MED AMINE LARIBI, JUAN SANDOVAL, SAMI BENNOUR, ABDELFATTAH MLIKA, LOTFI ROMDHANE, SAÏD ZEGHLOUL

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