



I4SDG 2021

IFToMM for Sustainable Development Goals

Detailed Program

25-26 November 2021

Day 1 Thursday 25 November

CET Time (Central European Time)

CET time	Activity	Room
9.00-9.30	Opening ceremony	Virtual Room 1
9.30-10.00	Plenary lecture 1 Arturo Baroncelli Industrial and Service Robotics: History, Statistics, State of the art Opportunities towards Sustainability	Virtual Room 1

CET time * = extended abstract only

CET time	Activity	Room
10.00-11.00	4x15 min S2: Appropriate Technologies and Technical Systems for sustainable and inclusive development Session Chairs: Giulio Reina, Walter Franco	Virtual Room 1
	ID	Title
		Authors
10.00-10.15	58 Float-Ram: a sustainable machine for buildings made by compressed earth blocks	Giuseppe Quaglia, Carlo Ferraresi, Walter Franco
10.15-10.30	73 The SNAP: a novel four-wheel pedal-assisted electric lightweight vehicle	Francesco Passarella, Giacomo Mantriota, Giulio Reina
10.30-10.45	74 The contribution of Ellul and Illich's Thought to the Design of Appropriate Machines for Communities in Socio-Ecological Transition	Walter Franco, Osman Arrobbio
10.45-11.00	105 Smaller is often better: A revival of interest in research and development in cost effective smaller scale machines for equitable rural economic development	Stephen D. Biggs, Scott E. Justice

CET time	Activity	Room
10.00-11.00	4x15 min S5-1: Green Tribology Session Chairs: Silvia Logozzo, Enrico Ciulli	Virtual Room 2
	ID	Title
		Authors
10.00-10.15 *	011 On the Tribological Characteristics of Multilayer Coatings for Sustaining Durability of Mechanical Components	Kuk-Jin Seo, Dae-Eun Kim
10.15-10.30	017 Wear Assessment and Reduction for Sustainability: Some Applications	Silvia Logozzo, Maria Cristina Valigi
10.30-10.45 *	023 Tribological behavior of thin soft coatings in the presence of interfacial friction	Nicola Menga, Giuseppe Carbone, Daniele Dini
10.45-11.00	025 The challenges of oil free bearings in micro-turbomachinery	Federico Colombo, Luigi Lentini, Terenziano Raparelli, Andrea Trivella

CET time	Activity	Room
10.00-11.00	3x15 min S8-1: Rotordynamics, Multibody Dynamics and Vibrations Session Chairs: Paolo Boscaroli, Giovanni Boschetti	Virtual Room 3
	ID	Title
		Authors
10.00-10.15 *	022 Tribo-dynamic model of a balanced vane pump for wear prevention	Caterina Natali, Mattia Battarra, Giorgio Dalpiaz, Emiliano Mucchi
10.15-10.30	026 Virtual Turbocharger as A Tool for Reality Simulation	Pavel Novotný, Jiří Vacula, Petr Kudláček
10.30-10.45 *	037 Fourier-Bessel based Blind Deconvolution indicator for bearing damaging level assessment	Elia Soave, Gianluca D'Elia, Giorgio Dalpiaz
10.45-11.00		

CET time	Activity
11.00-11.15	Coffee break

Day 1 Thursday 25 November



CET time * = extended abstract only

11.15-12.45	6x15 min	S1-1: Sustainable Energy Systems	Virtual Room 1
Session Chairs: Macedon Moldovan, Giuseppe Quaglia			
	ID	Title	Authors
11.15-11.30	024	Design and numerical study of a 2-DoF mechanism for efficient wave energy extraction in onshore application	Luigi Solazzi, Nicola Pellegrini
11.30-11.45 *	029	Modelling and experimental characterisation of a pressure differential wave energy converter with a dielectric elastomer generator	Giacomo Moretti , Michele Righi, David Forehand, Lorenzo Agostini, Rocco Vertechy, Marco Fontana
11.45-12.00	034	Scaled prototyping of an onshore oscillating-arm Wave Energy Converter	Luca Bruzzone , Giovanni Berselli, Pietro Fanghella
12.00-12.15	035	Heat Transfer Behaviour of Hybrid Solar Collector Module for Liquid-Based Type	Ahssan M. A. Alshibil , Pirooska Vig, Istvan Farkas
12.15-12.30	036	Thermal Improvement in Parabolic Trough Solar Collector Using Receiver Tube Design and Nanofluid	Asaad Yasseen Al-Rabeeah , Istvan Seres, Istvan Farkas
12.30-12.45	040	Robotics applied to precision agriculture: the sustainable Agri.q rover case study	Andrea Botta , Paride Cavallone

11.15-12.45	6x15 min	S3-1: Biomechanical Engineering	Virtual Room 2
Session Chairs: Vincenzo Parenti Castelli, Christopher Torres-SanMiguel			
	ID	Title	Authors
11.15-11.30	015	Graph-based structural analysis of kinetic art mechanisms on the example of a moving horse mechanism	P. A. Andrienko, A. N. Evgrafov, D. P. Kozlikin , Y. A. Semenov, N. S. Semenova
11.30-11.45	047	A New Sustainable Soft Body Protector for Increasing Human Safety in Combat Sports: The Case of Taekwondo	Denis Damiano, Angelo Davalli, Elvio Bonisoli, Giovanni Gerardo Muscolo
11.45-12.00	048	New Sustainable Biped-Wheeled Exoskeleton Prototypes	Alessandro Loschi, Alessandro Smerchinich, Giovanni Gerardo Muscolo
12.00-12.15	049	Preliminary experimental test of a cable-driven wheelchair in different configurations	Paride Cavallone , Andrea Botta, Elvio Bonisoli, Giuseppe Quaglia
12.15-12.30	060	Detecting impulsive movements to increase operators' safety in manufacturing	Valeria Rosso , Laura Gastaldi, Stefano Pastorelli
12.30-12.45	061	Intercity Bus occupant Safety	V. M. Cantor Mexquititla, M. A. Rivera-Hernández , C. R. Torres-SanMiguel

11.15-12.45	6x15 min	S4-1: Robotics and Mechatronics	Virtual Room 3
Session Chairs: Alessandro Gasparetto, Luca Carbonari			
	ID	Title	Authors
11.15-11.30	013	A proof of concept of self replicating robots for space settlements	Paolo Gallina , Nicola Scuor, Massimiliano Nolic, Lorenzo Scalera, Alessandro Gasparetto, Stefano Seriani
11.30-11.45	014	Mechanism designs for solar tracking	Matteo Russo , Marco Ceccarelli
11.45-12.00	018	An Automated Procedure For Crack Detection	Erika Pellegrino , Tania Stathaki
12.00-12.15	027	Modelling of Unmanned Aerial Vehicles with Vertical Take Off and Landing Capabilities	Armando Casazza, Roberto Fiorenzani, Alberto Mela, Luca Pugi , Alberto Reatti
12.15-12.30 *	028	Nonlinear Optimal Control of Electric Vehicle Lateral Dynamics	Parichat Yubonbanditkun , Xu Xu, Basilio Lenzo, Moad Kissai
12.30-12.45	039	Underactuated soft gripper for helping humans in harmful works	Gabriele Maria Achilli , Silvia Logozzo, Maria Cristina Valigi, Gionata Salvietti, Domenico Prattichizzo, Monica Malvezzi

12.45-13.45	Lunch break		
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Day 1 Thursday 25 November

CET time	* = extended abstract only		
13.45-15.15	6x15 min	S1-2: Sustainable Energy Systems	Virtual Room 1
Session Chairs: Giuseppe Quaglia, Macedon Moldovan			
	ID	Title	Authors
13.45-14.00	054	Design and preliminary testing of cleanator a mechatronic system for solar panels cleaning	Marco Cristodaro, Santina Fortuna, <u>Alessia Greco</u> , Antonio Carmelo Petrolino, Giuseppe Carbone
14.00-14.15	062	Numerical Approaches for Loads and Motions Assessment of Floating WECs Moored by Means of Catenary Mooring Systems	<u>Imanol Touzon</u> , Victor Petuya, Vincenzo Nava, Maria Alonso-Reig, Iñigo Mendikoa
14.15-14.30	064	Design of a reinforced concrete wave energy converter in extreme wave conditions	<u>Costanza Anerdi</u> , Bruno Paduano, Pietro Casalone, Mattiazzo Giuliana, Luca Giordano
14.30-14.45	067	Expanding operational bandwidth and tuning a Wave Energy Converter using U-shaped sloshing tanks	Marco Fontana, Sergej A. Sirigu, Giuseppe Giorgi, Giovanni Bracco
14.45-15.00	084	Achieving the Sustainable Development Goals through Education on Renewable Energy	Ion Visa, <u>Macedon Moldovan</u>
15.00-15.15	091	Using Remotely Operated Vehicles for the sustainable exploitation of aquaculture farms.	<u>Fernando Gomez-Bravo</u> , Alejandro Garrocho Cruz, Juan Carlos Gutierrez-Estrada, Inmaculada Pulido-Calvo, Jairo Castro-Gutiérrez, Antonio Peregrín-Rubio, Samuel

CET time			
13.45-15.15	5x15 min	S3-2: Biomechanical Engineering	Virtual Room 2
Session Chairs: Carlo Ferraresi, Marco Cocconcelli			
	ID	Title	Authors
13.45-14.00	065	A new mask-based technique for stereotactic brain neurosurgery	Mirko Patuzzo, Nicola Sancisi, <u>Vincenzo Parenti Castelli</u>
14.00-14.15	069	Estimation of force effectiveness and symmetry during krancking training	Elisa Digo, Laura Gastaldi, Mattia Antonelli, <u>Valerio Cornagliotto</u> , Stefano Pastorelli
14.15-14.30	086	Applications of Intermittent Pneumatic Compression for diagnostic and therapeutic purposes	Carlo Ferraresi, Walter Franco, Daniela Maffiodo, Carlo De Benedictis, Maria Paterna, <u>Daniel Pacheco Quiñones</u> , Leonardo Ermini, Silvestro Roatta
14.30-14.45	093	Addictive manufacturing low-cost hand exoskeleton for rehabilitation: prototype with driven flexion/extension	<u>Cosimo Fonte</u> , Matteo Strozzi, Riccardo Rubini, Marco Cocconcelli
14.45-15.00	095	Intersomatic screw experimental study to treat lumbar disc herniations	<u>A. Oropeza-Osornio</u> , C. R. Torres-SanMiguel, G. M. Urriolagoitia-Calderón
15.00-15.15			

CET time			
13.45-15.15	6x15 min	S4-2: Robotics and Mechatronics	Virtual Room 3
Session Chairs: Luca Bruzzone, Ismet Mehemet Can Dede			
	ID	Title	Authors
13.45-14.00	101	Experimental evaluation of the behaviour of Nitinol bars for a compliant parallel trunk rehabilitation device	<u>F. J. Campa</u> , D. Díaz-Caneja, O. Altuzarra
14.00-14.15	043	A control architecture for the hybrid hexapod robot R3HC	Fernando Gomez-Bravo, <u>Alejandro Garrocho Cruz</u> , Giuseppe Carbone
14.15-14.30	044	Does inertia matching imply energy efficiency?	<u>Paolo Boscariol</u> , Roberto Caracciolo, Dario Richiedei
14.30-14.45	057	Preliminary comparison between handheld and mobile robotic mapping systems	<u>Eleonora Maset</u> , Lorenzo Scalera, Alberto Beinart, Federico Cazorzi, Fabio Crosilla, Andrea Fusiello, Alessandro Gasparetto
14.45-15.00	059	Design and implementation the robotics system for glass containers depalletizing	<u>Irina I. Kalapyshina</u> , Konstantin A. Nuzhdin
15.00-15.15	075	Experimental Characterization of an Electrical Propulsion Unit for Service UAVs	<u>Cinzia Amici</u> , Federico Ceresoli, Matteo Saponi, Marco Pasetti, Simone Zanoni, Alberto Borboni, Monica Tiboni, Rodolfo Faglia

CET time			
15.15-15.30	Coffee break		

Day 1 Thursday 25 November



CET time * = extended abstract only

CET time	6x15 min	S6: Micromachines, Linkage and mechanical control	Virtual Room 1
Session Chairs: Erwin-Christian Lovasz, Victor Petuya			
	ID	Title	Authors
15.30-15.45 *	030	Designing, Kinematic and Kinetostatic Analysis of a Novel Planar-screw Mechanism	<u>Alexey Fomin</u>
15.45-16.00 *	045	Kinematic constraints of twin lip vanes adopted in balanced vane pumps	<u>Davide Guerra</u> , Mattia Battarra, Emiliano Mucchi
16.00-16.15	051	Application of apodized fiber Bragg gratings in information security systems	<u>Guljan Kashaganova</u> , Sandugash Orazaliyeva, Gani Balbayev, Zhuldyz Alimseitova, Giuseppe Carbone
16.15-16.30	078	Kinematic performance analysis of a 3-R(RPRGR)RR planar parallel robot	Alexandru Oarcea, Antonio Marius Flavius Lupuți, <u>Victor Cobilean</u> , Sergiu-Dan Stan, Erwin-Christian Lovasz
16.30-16.45	082	Control process for an industrial bending machine designed for metal processing	<u>Alexandru Oarcea</u> , Victor Cobilean, Sergiu-Dan Stan, Adrian Bozian
16.45-17.00	097	High-speed dimensional processing of metallic materials with an environmentally friendly jet electrolyte-plasma method	<u>Alexander Popov</u> , Alla Popova, Alexandr Fumin, Mikhail Novoselov, Sergey Zakharov, Mikhail Radkevich

CET time

CET time	5x15 min	S9-1: History of Mechanism and Machine Science, Education	Virtual Room 2
Session Chairs: Walter Franco, Vittorio Marchis			
	ID	Title	Authors
15.30-15.45	012	The Machine, IFToMM and Ethics	<u>Teun Koetsier</u>
15.45-16.00	016	A Sustainable Association Case Study: IFToMM Member Organization Turkey	<u>Gökhan Kiper</u> , Eres Söylemez
16.00-16.15	020	Implementation of a Didactic Regenerative Braking System	<u>Bechara Nehme</u> , Tilda Akiki, Barbar Zeghondy
16.15-16.30	031	Assistant Teaching Platform for Creative Mechanical Design Course	Yu-Tong Li, <u>Yu-Xin Wang</u>
16.30-16.45	050	Beyond the mechanical engineering education. New frontiers for a sustainable growth	<u>Vittorio Marchis</u>
16.45-17.00			

Day 2 Friday 26 November



CET Time (Central European Time)

CET time		
9.00-9.30	opening 2nd day and plenary lecture 2 Can Dede Understanding the role of IFToMM activities for achieving SDGs	Virtual Room 1

CET time * = extended abstract only

9.30-10.30	4x15 min	S8-2: Rotordynamics, Multibody Dynamics and Vibrations	Virtual Room 1
Session Chairs: Domenico Mundo, Giovanni Boschetti			
	ID	Title	Authors
9.30-9.45 *	038	Nonlinear dynamic modeling of a radially loaded self-aligning ball bearing with localized faults	<u>Alberto Gabrielli</u> , Mattia Battarra, Emiliano Mucchi
9.45-10.00	055	An overview on acoustic metamaterials	<u>Walter Bova</u> , Eugene Nijman, Domenico Mundo
10.00-10.15	079	Parameter Tuning of ODE-based Walking Control Algorithm for a Six Legged Mobile Robot	Şahin Yıldırım, <u>Erdem Arslan</u>
10.15-10.30	089	Safety of multi-link road trains weighing 60 tons	<u>Aleksey Vasiliev</u> , Roman Dobretsov

CET time			
9.30-10.30	4x15 min	S5-2: Green Tribology	Virtual Room 2
Session Chairs: Enrico Ciulli, Federico Colombo			
	ID	Title	Authors
9.30-9.45	052	Contact models and reduction of instabilities in sealing rings for sustainability purposes	Maria Cristina Valigi, <u>Silvia Logozzo</u> , Claudio Braccesi
9.45-10.00	053	Green Tribology for Sustainable Development Goals	<u>Nikolai K. Myshkin</u> , Feodor A. Grigoriev
10.00-10.15	063	Green ferritic stainless steel: A sustainable, advanced and cost-effective solution for the concrete mixer drum	<u>Wiliam S. Labiapari</u> , Ricardo J. Gonçalves Costa, Claudio M. de Alcântara, Vitor Pagani, Julio C. Di Cunto, Jose D.
10.15-10.30	066	Tribology and Sustainable Development Goals	<u>Enrico Ciulli</u>

CET time			
9.30-10.30	4x15 min	S4-3: Robotics and Mechatronics	Virtual Room 3
Session Chairs: Giuseppe Carbone, Matteo Russo			
	ID	Title	Authors
9.30-9.45	090	Study of cooling systems for electronic components used in robotic applications	<u>Narcis Gratian Crăciun</u> , Erwin Christian Lovasz, Carmen Sticlaru
9.45-10.00	094	Genetic Algorithm based PID parameter optimization for longitudinal dynamics of a fixed wing mini UAV	<u>Şaban Ulus</u> , İkbâl Eski
10.00-10.15	096	Performance Analysis of Localization System for Wireless Robotic Capsule Endoscopy Based on 5 DOF	<u>Memduh Suveren</u> , Muzaffer Kanaan
10.15-10.30 *	099	Increasing Energy Efficiency of Welding Robots by Optimization	<u>Özgün Selvi</u> , Onat Halis Totuk, Giuseppe Carbone

CET time	
10.30-10.45	Coffee break



Day 2 Friday 26 November

CET time * = extended abstract only

10.45-12.15	4x15 min	S9-2: History of Mechanism and Machine Science, Education	Virtual Room 1
Session Chairs: Vittorio Marchis, Walter Franco			
	ID	Title	Authors
10.45-11.00	068	Non-circular gears: innovative manufacturing technologies	<u>O. V. Egorova</u> , N. N. Barbashov, L. R. Abdullina, R. M. Kiselev
11.00-11.15	076	The Monolith: Epic of the Mechanical Progress, from the Great Exhibition to a Space Odyssey	<u>Marco Pozzi</u>
11.15-11.30	088	Innovative and multidisciplinary teaching to design a low consumption vehicle	<u>Massimiliana Carello</u>
11.30-11.45	098	Siméon-Denis Poisson's General Theory of Machines (1833)	<u>Sandro Caparrini</u>

CET time
10.45-12.15

6x15 min	S7: Transportation Machinery, Engines and Powertrains	Virtual Room 2	
Session Chairs: Jose Serrano, Mauro Velardocchia			
	ID	Title	Authors
10.45-11.00	* 009	Oxyfuel combustion for zero tank-to-wheel tail-pipe emissions in a compression ignition engine.	<u>Jose Serrano</u>
11.00-11.15	* 021	Vehicle Cornering Response Design through Maps of Achievable Performance	<u>Mariagrazia Tristano</u> , Basilio Lenzo
11.15-11.30	033	Quantum chemical study of mechanochemical reactive mechanisms of engine oil antiwear additives	<u>Chao Zhang</u>
11.30-11.45	056	Global efficiency of power-split hybrid electric powertrain	<u>Antonella Castellano</u> , Marco Cammalleri
11.45-12.00	070	Steering mechanisms with alterable kinematic parameter	Roman Yu. Dobretsov, Andrei V. Lozin, <u>Andrei O. Kaninskii</u> , Vladimir E. Rolle
12.00-12.15	071	On the Power-weighted Efficiency of Multimode Powertrains: a case study on a Two-Mode Hybrid System	<u>Antonio Tota</u> , Enrico Galvagno, Mauro Velardocchia

CET time
10.45-12.15

6x15 min	S4-4: Robotics and Mechatronics	Virtual Room 3	
Session Chairs: Yukio Takeda, Giulio Reina			
	ID	Title	Authors
10.45-11.00	100	Digital Twin of a Servo Driver of a Servo Motor as a First Step towards a Digital Twin of a Robot Mechanism	<u>Sefa Furkan Küçüköğlü</u> , Giuseppe Carbone, Mehmet Ismet Can Dede
11.00-11.15	042	Assistive Mobile Manipulator Proposal Based on the Modular Paquitop Platform	<u>Giovanni Colucci</u> , Luigi Tagliavini
11.15-11.30	102	Model Based Estimation of Passive Joint Clearance in Parallel Robot and its Application to Failure Detection	Masumi Ohno, <u>Yukio Takeda</u>
11.30-11.45	* 103	The Paquitop Omnidirectional Platform: a modular conceived robots for assistive tasks	<u>Luigi Tagliavini</u> , Giovanni Colucci
11.45-12.00	104	Mobile robotics for sustainable development: Two case studies	<u>Rocco Galati</u> , Giacomo Mantriota, Giulio Reina
12.00-12.15	106	Balancing of a haptic device with sets of springs	Mattia Persampieri, Gianluca Gatti, <u>Giuseppe Carbone</u>

CET time
12.15-13.00

	Awards and closing ceremony	Virtual Room 1
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