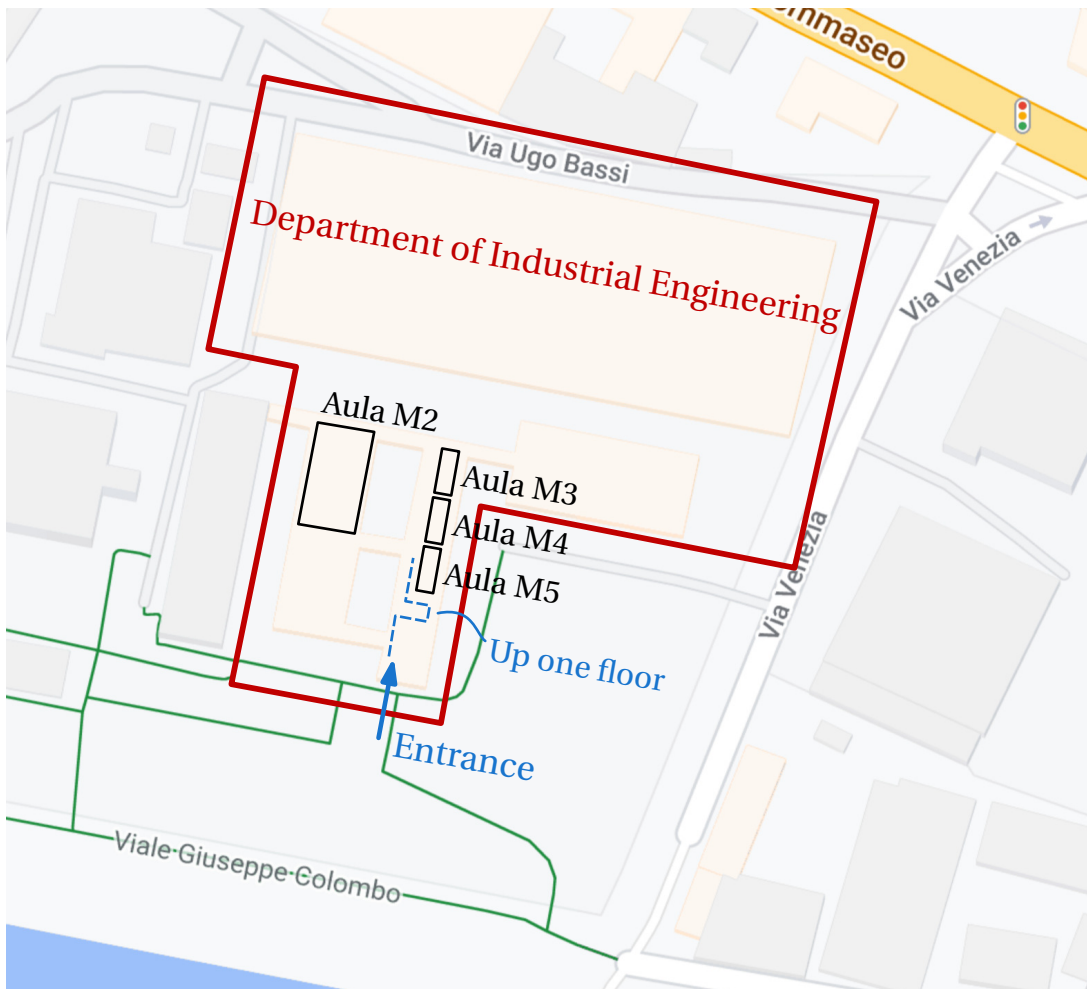
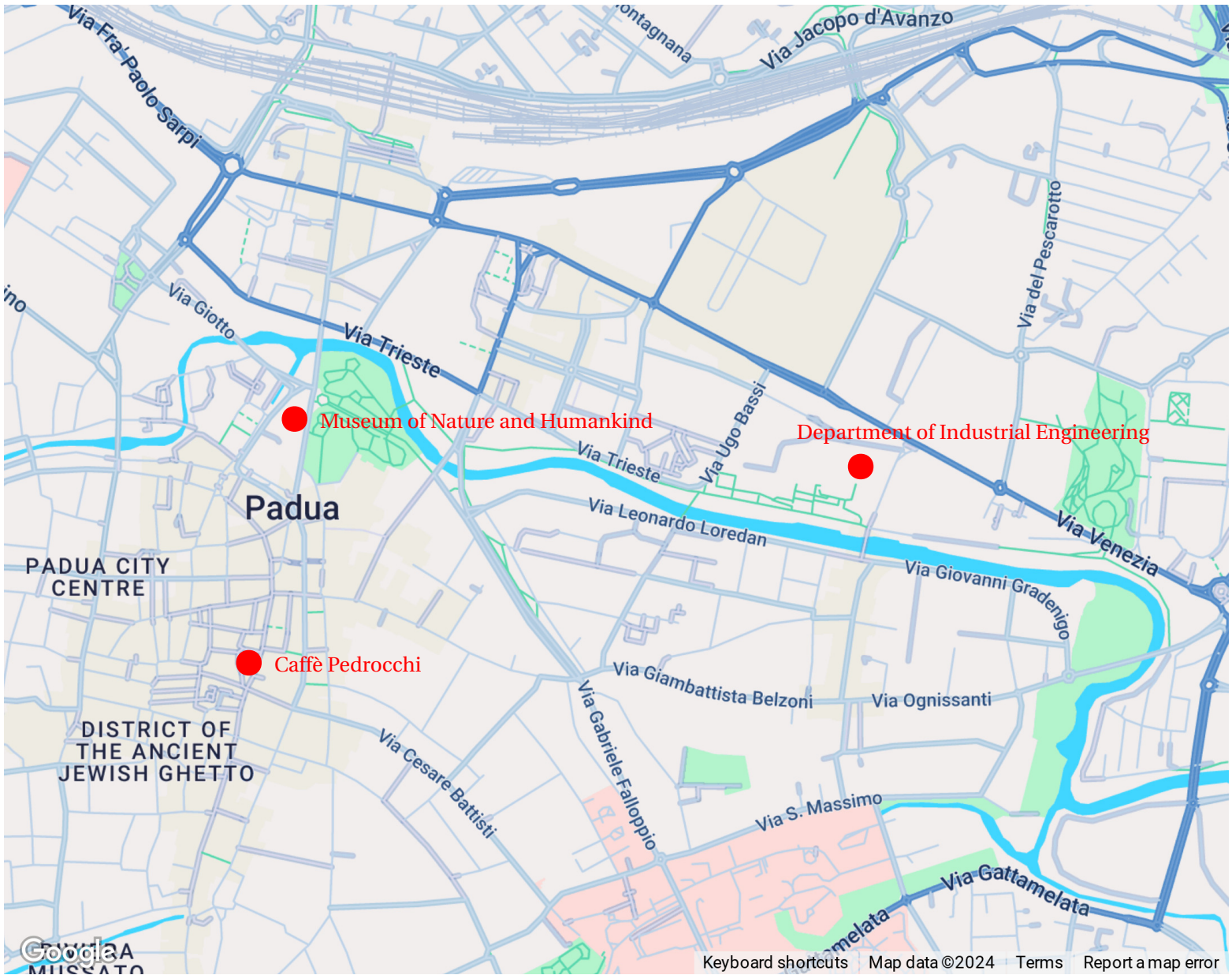


# EuCoMeS 2024 – Program





Caffè  
Pedrocchi



Department of  
Industrial  
Engineering



Museum



# Overview

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## Wednesday, 18<sup>th</sup> September 2024

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09:30		Open registration @ Aula M5
10:30 - 11:00		COFFEE BREAK
11:00 - 11:30		Opening ceremony @ Aula M2
11:30 - 12:30		Plenary session @ Aula M2
12:30 - 14:00		LUNCH
14:00 - 15:50	Vehicle dynamics (5) @ Aula M3	Mechanisms for biomechanics I (5) @ Aula M4
15:50 - 16:30		COFFEE BREAK
16:30 - 18:00	Mechatronics (4) @ Aula M3	Mechanism design (4) @ Aula M4
18:00	WELCOME COCKTAIL / LIGHT DINNER	

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## Thursday, 19<sup>th</sup> September 2024

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09:00 - 10:40	Control issues of mechanical systems I (5) @ Aula M3	Mechanisms for biomechanics II (4) @ Aula M4
10:40 - 11:10		COFFEE BREAK
11:10 - 13:00	Robotics (4) @ Aula M3	Mechanical transmissions and gears (5) @ Aula M4
13:00 - 14:30		LUNCH
15:30	Visit at the MUSEUM OF NATURE AND HUMANKIND	
19:00	COCKTAIL, GALA DINNER and AWARD CEREMONY @ Caffè Pedrocchi	

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## Friday, 20<sup>th</sup> September 2024

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09:00 - 10:00	Control issues of mechanical systems II (3) @ Aula M3	Robotics II (3) @ Aula M4
10:00 - 10:30		Closing ceremony @ Aula M2
10:30 - 11:00		COFFEE BREAK

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# Sessions - Wednesday 18<sup>th</sup>

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## Vehicle dynamics - Aula M3 (14:00)

Chairs: Daniel Garcia-Pozuelo Ramos, Jan-Lukas Archut

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11	<b>Jan-Lukas Archut</b> , Burkhard Corves	Real-Time Flexible Multibody Simulation of a Vehicle Wheel Suspension with Elastokinematic Properties based on Inertia Relief Modes
14	<b>Farshad Afshari</b> , Daniel Garcia-Pozuelo Ramos	Setting up a model to study the truck mixer dynamics I
17	<b>Daniel Garcia-Pozuelo Ramos</b> , Farshad Afshari, Miguel Ángel Martínez-Casanova, Fernando Viadero-Monasterio, Carolina Álvarez-Caldas, José Antonio Calvo-Ramos	Designing a new sustainable and instrumented tire: ECOTIRE
23	<b>Farshad Afshari</b> , Daniel Garcia-Pozuelo Ramos	Setting up a model to study the truck mixer dynamics II
29	<b>Madhusudan Raghavan</b> , Shuonan Xu	The Influence of Vehicle Mass and Cell Type on eVTOL Battery Pack Designs* ( <i>*video presentation</i> )

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## Mechanisms for biomechanics I - Aula M4 (14:00)

Chairs: Marco Ceccarelli, Susana Sanz

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1	<b>Marco Ceccarelli</b> , Matteo Russo, Elie Shalom Mugisha	Design and Testing of a holter device for respiration monitoring
2	<b>Susana Sanz</b> , Marco Ceccarelli, Matteo Russo, Vicente Díaz	Requirements and problems for a sensed rotating device for arm exercise
3	<b>Marco Ceccarelli</b> , Matteo Russo, Giovanni Boschetti, Matteo Bottin	Problems and requirements for motion-assisting devices for elderly people
10	<b>Clara Kierbel</b> , Matteo Russo, Ilenia Mappa, Giuseppe Rizzo, Marco Ceccarelli	Requirements for robotic gynecologic surgery
25	<b>Sergei Kotov</b> , Marco Ceccarelli, Matteo Russo	Design problems and requirements for assisting devices

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## Mechatronics - Aula M3 (16:30)

Chairs: Paulo Flores, Daniel Garcia-Pozuelo Ramos

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22	<b>Daniel Garcia-Pozuelo Ramos</b> , Fernando Viadero-Monasterio, María Jesús López Boada, Ramón Gutiérrez-Moizant, Manuel Jiménez-Salas	Innovative Teaching Project: Design and Optimization of a Tubular Chassis for Automobiles Using Generative Artificial Intelligence Tools
42	Yue Yu, <b>Hamid Reza Karimi</b> , Youqian He	A Multi-source Sensors Framework for Mechanical Fault Diagnosis under Strong Noise
46	<b>Paulo Flores</b> , Hamid Lankarani	State-of-the-art and challenges of contact-impact problems using multibody dynamics methodologies

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## Mechanism design - Aula M4 (16:30)

Chairs: Giuseppe Carbone, Philippe Wenger

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6	Jan-Lukas Archut, Johannes Bolk, Marwène Nefzi, <b>Burkhard Corves</b>	Broad Frequency Range Decoupling based on Elastic Bedding And Zero Stiffness Design
31	<b>Philippe Wenger</b> , Christine Chevallereau	A simple revolute joint with coactivation principle
37	<b>David Herrmann</b> , Leon Schaeffer, Lukas Lehmann, Tobias Busch, Valter Böhm	Preliminary theoretical considerations on 2D multistable tensegrity structures based on equilateral triangles
39	Larisa Rybak, Vladislav Cherkasov, Dmitry Malyshev, Dmitry Dyakonov, <b>Carbone Giuseppe</b>	New design of the gripper and its orientation algo-rithm for placing test tubes and tripods with a robotic system for aliquoting biomaterials

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# Sessions - Thursday 19<sup>th</sup>

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## Control issues of mechanical systems I - Aula M3 (09:00)

Chairs: **Iacopo Tamellin, Jason Bettega**

38	<b>Stefano Lovato</b> , Matteo Massaro, Ludovico Ortombina	The optimal swing-up of the double pendulum
16	Jason Bettega, Dario Richiedei, <b>Iacopo Tamellin</b> , Alberto Trevisani	Model inversion for tip control of underactuated non-minimum phase gantry cranes with small inertia ratio
19	<b>Domenico Donà</b> , Paolo Boscariol, Matteo Bottin, Basilio Lenzo, Giulio Rosati	Increasing lifting efficiency of a cable-driven crane through motion design
21	<b>Jason Bettega</b> , Dario Richiedei, Iacopo Tamellin, Alberto Trevisani	Path Following of Cable Suspended Parallel Robots through Nonlinear Model Predictive Control
32	<b>Vincenzo Di Paola</b> , Stéphane Caro, Matteo Zoppi	Design of a SM-APID Control for Rigid-Body Transportation Under the Effects of Wind

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## Mechanisms for biomechanics II - Aula M4 (09:00)

Chairs: **Miguel Silva, Matteo Bottin**

18	<b>Luis Angel Guerrero-Hernández</b> , Christopher René Torres-San Miguel, Juan Alejandro Flores-Campos, Marco Ceccarelli	Performance testing of an integrated car child restraint system
34	Francisco Melo, Sérgio Gonçalves, Pedro Areias, <b>Miguel Silva</b>	Analysis of the Foot-Ground Contact using an MSD-FEM Co-simulation Approach
41	<b>Paul Tucan</b> , Iosif Birlescu, Alexandru-Vasile Pusca, Bogdan Gherman, Daniela Jucan, Tiberiu Antal, Calin Vaida, Adrian Pislă, Damien Chablat, Doina Pislă	A flexible instrument for robotic assisted minimally invasive esophagectomy
45	Giovanni Boschetti, <b>Matteo Bottin</b> , Roberta D'Angelo, Valeria Bianca Fantini	Design of a robotic cable device for rehabilitation of the upper limbs

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## Robotics I - Aula M3 (11:10)

Chairs: **Monica Urizar; Riccardo Minto**

5	<b>Diego Tiozzo Fasiolo</b> , Lorenzo Scalera, Eleonora Maset, Alessandro Gasparetto	Robotic mapping and detection of dynamic objects in outdoor environments
8	<b>Davide Galli</b> , Renzo Odorizzi, Renato Vidoni, Dylan Morelato	Development of a Mechatronic System for Semiconductor Resistivity Measurements
24	<b>Alessio Caneschi</b> , Matteo Bottin, Alberto Doria, Andrea Cesaro, Giulio Rosati	Lumped parameters robot models to study impact dynamics
27	Giovanni Boschetti, <b>Riccardo Minto</b>	A comparison of control strategies for collaborative mobile robots
28	José Luis Ruiz, Oscar Altuzarra, <b>Monica Urizar</b>	Forward kinematics and workspace analysis of 2-axes continuum Keops-Delta

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## Mechanical transmissions and gears - Aula M4 (11:10)

Chairs: **Alfonso Fernandez Del Rincon, Fernando Viadero**

7	José I. Pedrero, <b>Miguel Pleguezuelos</b> , Miryam B. Sánchez	Analysis of the transmission error and mesh stiffness of load-induced high contact ratio external spur gears
12	Javier Sanchez-Espiga, Miguel Iglesias, Alberto Diez-Ibarbia, Alfonso Fernandez Del Rincon, <b>Fernando Viadero</b>	On the behaviour of planetary gear sets with an $n$ number of planets
13	Javier Sanchez-Espiga, <b>Alfonso Fernandez Del Rincon</b> , Alberto Diez-Ibarbia, Ana de Juan, Pablo Garcia, Fernando Viadero	Impact of the load in the orbits described by the sun gear in a planetary gear set with an odd number of planets
20	<b>Martin Eizmendi</b> , Iker Heras, Josu Aguirrebeitia	Undamped dynamic response modelling of four-point contact slewing bearings
35	<b>Giuseppe Sciarra</b> , Giovanni Mottola, Gustavo Casamenti, Marco Carricato	An innovative low-backlash Wolfrom gearbox with beveloid gears for robotic applications

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# Sessions - Friday 20<sup>th</sup>

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## Control issues of mechanical systems II - Aula M3 (09:00)

Chairs: Luca Bruzzone, Michele Tonan

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4	<b>Michele Tonan</b> , Alberto Doria, Matteo Bottin, Giulio Rosati	Planning of underactuated differentially flat robot trajectories with a via point
33	<b>Luca Bruzzone</b> , Pietro Fanghella, Matteo Verotti	Exploiting the Natural Motion of a SCARA-Like Manipulator for Pick-And-Place Tasks
43	<b>Filippo Brasina</b> , Luca Guagliumi, Roberto Di Leva, Marco Carricato	Anti-sloshing motion laws for one-dimensional piecewise trajectories

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## Robotics II - Aula M4 (09:00)

Chairs: Gaetano Lettera, Teresa Sinico

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30	<b>Andrey Vukolov</b>	D-Star-based Optimized Trajectory Planner for Mobile Robots Operating in Dense Environments
36	Giovanni Boschetti, Giulio Rosati, <b>Teresa Sinico</b>	Retrofit and interface of a SCARA robot with a PLC for real-time direct joint control
40	<b>Gaetano Lettera</b> , Albin Bajrami, Daniele Costa, Massimo Callegari	Dynamic Safety Evaluation and Risk Mitigation Strategies for Collaborative Kitting

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