

Program Wednesday 08/06/2022

08:00	08:30	Registration	
08:30	09:00	Official Opening: Andreas Müller and Mathias Brandstötter	
09:00	09:30	Opening Address: Jadran Lenarčič	
09:30	10:30	Keynote 1: Trash or treasure? On AI in industrial robotics (and why we still need mechatronics) Arne Wahrburg	
10:30	11:00	Coffee-Break	
11:00	12:00	S1a: Robot Modeling and Identification	S1b: Motion Planning and Control
		<p>Aleksandar Rodić</p> <p>11:00 - 11:18 Geometric Identification of Denavit-Hartenberg Parameters with Optical Measuring System <i>(Leon Žlajpah, Tadej Petric)</i></p> <p>11:18 - 11:36 Kinematics of the “Ai-Gerim” Robot Arm <i>(Zhumadil Baigunchekov, Giuseppe Carbone, Zhadyra Zhumasheva, Bekzat Amanov, Yernar Zholdassov, Alibek Tleukhanov)</i></p> <p>11:36 - 11:54 Singularity Robust Inverse Kinematics of Serial Manipulators by means of a Joint Arc Length Parameterization <i>(Tobias Marauli, Hubert Gattringer, Andreas Müller)</i></p>	<p>Med Amine Laribi</p> <p>11:00 - 11:18 Projecting Robot Dynamics onto Trajectories <i>(Friedrich Pfeiffer)</i></p> <p>11:18 - 11:36 Fitting Constrained Trajectory with High Variability into Redundant Robot Workspace <i>(Zvezdan Loncarevic, Tadej Petric, Andrej Gams)</i></p> <p>11:36 - 11:54 Experimental validation of a Variable Stiffness Joint based on antagonistic principle <i>(Maria Guadalupe Contreras Calderon, Juan Sandoval, Eduardo Castillo, Med Amine Laribi)</i></p>
12:00	13:30	Lunch (ISC Meeting)	
13:30	15:00	S2a: Robot Modeling and Identification	S2b: Perception and Learning
		<p>Mathias Brandstötter</p> <p>13:30 - 13:48 Simulation of the Effects of Backlash on the Performance of a Collaborative Robot: A Preliminary Case Study <i>(Roberto Guida, Andrea Raviola, Domenico Fabio Migliore, Andrea De Martin, Stefano Mauro, Massimo Sorli)</i></p> <p>13:48 - 14:06 Parallelized Forward Kinematics using Product of Exponentials in PyTorch <i>(Hristo Vrigazov, Kaloyan Yovchev)</i></p> <p>14:06 - 14:24 Simultaneous Calibration and Stiffness Identification of Flexible Link Robots using Lumped Parameter Model <i>(Stefan Gadringer, Patrick Klement, Hubert Gattringer, Andreas Mueller, Ronald Naderer)</i></p> <p>14:24 - 14:42 Analysis of the singularities influence on the forward kinematics solution and the geometry of the workspace of the Gough-Stewart platform <i>(Dmitry Malyshev, Larisa Rybak, Anton Pisarenko, Vladislav Cherkasov)</i></p> <p>14:42 - 15:00 Modeling and Analysis of an S-Shape Link for an Anthropomorphic Robotic Arm <i>(Qun Xing Xue, Fengfeng Xi)</i></p>	<p>Lotfi Romdhane</p> <p>13:30 - 13:48 Structure Synthesis for Extended Robot State Automata <i>(Lukas Sauer, Dominik Henrich)</i></p> <p>13:48 - 14:06 Intuitive Optimization of Kinesthetic Programmed Trajectories for Fiber Spraying <i>(Edgar Schmidt, Dominik Henrich)</i></p> <p>14:06 - 14:24 Towards Dynamic Obstacle Avoidance for Robot Manipulators with Deep Reinforcement Learning <i>(Friedemann Zindler, Matteo Lucchi, Lucas Wohlfahrt, Horst Pichler, Michael Hofbauer)</i></p> <p>14:24 - 14:42 Cable-driven Parallel Robot Accuracy Improving Using Visual Servoing <i>(Ferdaws Ennaïem, Abdelbadia Chaker, Juan Sandoval, Sami Bennour, Abdelfattah Mlika, lotfi romdhane, Said Zeghloul, Med Amine Laribi)</i></p> <p>14:42 - 15:00 Explaining Local Path Plans Using LIME <i>(Amar Hallilovic, Felix Lindner)</i></p>
15:00	15:30	Coffee-Break	
15:30	17:00	S3a: Perception and Learning	S3b: Robot Design and Synthesis
		<p>Aleksandar Rodić</p> <p>15:30 - 15:48 A Fast Method for Explanations of Failures in Optimization-based Robot Motion Planning <i>(Matthias Eder, Gerald Steinbauer-Wagner)</i></p> <p>15:48 - 16:06 Intelligent robotic knowledge-supported visual recognition of handled objects in conditions of acquiring incomplete information <i>(Jovan Šumarac, Uroš Ilić, Aleksandar Rodić, Xiangrong Xu)</i></p> <p>16:06 - 16:24 A Brief Survey of Sim2Real Methods for Robot Learning <i>(Konstantinos Dimitropoulos, Ioannis Hatzilygeroudis, Konstantinos Chatzilygeroudis)</i></p> <p>16:24 - 16:42 Applying Monte Carlo Search and Monte Carlo Tree Search on Embedded Systems to Play Connect Four with a Robotic Arm <i>(Moritz Duarte Pinheiro-Torres Vogt, Jörn Fischer, Thomas Ihme)</i></p> <p>16:42 - 17:00 Improving kinesthetic teaching of fine tasks using a teaching agent <i>(Aljaž Baumkircher, Marko Munih, Matjaž Mhelj)</i></p>	<p>Carlo Ferraresi</p> <p>15:30 - 15:48 Anatomy categorization of a serial metamorphic manipulator for optimized robust controller performance <i>(Stravopodis Nikolaos, Vassilis Moulitanitis)</i></p> <p>15:48 - 16:06 Design and Control of a Reclining Chair with Soft Pneumatic Cushions <i>(Marco Bellucci, Carlo Ferraresi, Giovanni Gerardo Muscolo)</i></p> <p>16:06 - 16:24 Kinematic Modelling of a Bioinspired Two Sections Serial Continuum Robot (SCR) <i>(Elie Gautreau, Juan Sandoval, Marc Arsicault, Xavier Bonnet, Said Zeghloul, Med Amine Laribi)</i></p> <p>16:24 - 16:42 A robot for facade cleaning based on a Cartesian configuration: kinematic analysis and prototype construction <i>(Ginna Marcela García Rodríguez, Eduardo Castillo)</i></p> <p>16:42 - 17:00 Study of a three-groove kinematic coupling for precise positioning in a robotized laser-cutting machine <i>(Carlo De Benedictis, Carlo Ferraresi)</i></p>
17:00	17:15	Keynote 2: What it means to build smart grasping services Mike Mayer	
17:15	19:30	Welcome Reception	

Program Thursday 09/06/2022

		Keynote 3: Robot Manipulation and Control	
		Bruno Siciliano	
08:30	09:30		
09:30	11:00	<p style="text-align: center;">S4a: Motion Planning and Control</p> <p>Leon Žlajpah</p> <p>09:30 - 09:48 Optimal Positioning of Mobile Manipulators Using Closed Form Inverse Kinematics <i>(Giovanni Colucci, Lorenzo Baglieri, Andrea Botta, Paride Cavallone, Giuseppe Quaglia)</i></p> <p>09:48 - 10:06 Multistage Approach for Solving the Optimal Control Problem for a Wheeled Inverted Pendulum with Infeasible Initial Guess <i>(Christian Zauner, Hubert Gattringer, Andreas Mueller)</i></p> <p>10:06 - 10:24 Computational-efficient Resolved Motion Rate Control with Task-space Trajectory Tracking <i>(Theodor Borangiu, Silviu Raileanu)</i></p> <p>10:24 - 10:42 Fractional-Order PI1/2DD1/2 control of a mechatronic axis: influence of the discrete-time approximation of the half-order derivative and integral <i>(Luca Bruzzone, Shahab Edin Nadehi)</i></p> <p>10:42 - 11:00 Fractional Order Calculus-inspired Kinematic Design in Adaptive Control <i>(Bence Varga, Richárd Horváth, József Tar)</i></p>	<p style="text-align: center;">S4b: Robot Design and Synthesis</p> <p>Jan De Jong, Loucas Louca</p> <p>09:30 - 09:48 Shape-changing manipulator possibilities and the effect of the deformable segment on the size of the working area <i>(Jakub Mlotek, Zdenko Bobovský, Jiří Suder, Petr Oščádal, Michal Vocetka, Václav Kryš)</i></p> <p>09:48 - 10:06 Analysis of Impacts of the Design Parameters on the Working Frequency of the Compliant Devices <i>(Jaroslav Hricko, Stefan Havlik)</i></p> <p>10:06 - 10:24 A robotics perspective on architecture: modelling and control of reconfigurable buildings <i>(Eftychios Christoforou, Loukas Georgiou, Marios Phocas, Loucas Louca, Andreas Mueller)</i></p> <p>10:24 - 10:42 Static modeling of an inflatable robotic arm for aerospace applications <i>(Mario Troise, Matteo Gaidano, Pierpaolo Palmieri, Andrea Ruggeri, Stefano Mauro)</i></p> <p>10:42 - 11:00 Static balance of a compliant four-bar mechanism: less torque with more preload <i>(Jan De Jong, Ronald Aarts)</i></p>
11:00	11:30	Coffee Break	
11:30	13:00	<p style="text-align: center;">S5a: Assistive and Medical Robots</p> <p>Karsten Berns</p> <p>11:30 - 11:48 Multibody Analysis and Design Optimisation of a Full-Scale Biped-Wheeled Exoskeleton <i>(Giuseppe Nigida, Elvio Bonisoli, Giovanni Gerardo Muscolo)</i></p> <p>11:48 - 12:06 Null-space Compliance with Non-Linear Behavior: Application to Spine Surgery Robotic Platform <i>(Alizée Koszulinski, Juan Sandoval, Terence Essomba, Tanguy Vendeuvre, Said Zeghloul, Med Amine Laribi)</i></p> <p>12:06 - 12:24 Optimal Multi-Robot Placement Based on Capability Map for Medical Applications <i>(Amir Trabelsi, Juan Sandoval, Abndelfattah Mlika, Samir Lahouar, Said Zeghloul, Jérôme Cau, Med Amine Laribi)</i></p> <p>12:24 - 12:42 EMG Driven Robotic-Aided Arm Rehabilitation <i>(Daniel Bonilla, Julian D. Colorado, Med Amine Laribi, Juan Sandoval, Catalina Alvarado Rojas)</i></p> <p>12:42 - 13:00 Evaluation on implementing an active braking system in wheelchair rear-mounted power-assisted device <i>(Valerio Cornagliotto, Flaminia Perino, Laura Gastaldi, Stefano Pastorelli)</i></p>	<p style="text-align: center;">S5b: Autonomous Mobile Manipulation</p> <p>Leon Žlajpah</p> <p>11:30 - 11:48 Flexible Vision-based Auto-docking Control System for Unmanned Ground Vehicles Equipped with Differential Chassis <i>(Andrei Vukolov, Georgios Kourousias, Roberto Pugliese)</i></p> <p>11:48 - 12:06 Autonomous Driving System for Reversing an Articulated Rover for Precision Agriculture <i>(Andrea Botta, Eleonora Moreno, Lorenzo Baglieri, Giovanni Colucci, Luigi Tagliavini, Giuseppe Quaglia)</i></p> <p>12:06 - 12:24 High Accuracy Data-Based Trajectory Tracking of an Omnidirectional Mobile Robot <i>(Hannes Eschmann, Henrik Ebel, Peter Eberhard)</i></p> <p>12:24 - 12:42 Recent trends in mobile robotics for 3D mapping in agriculture <i>(Diego Tiozzo Fasiolo, Lorenzo Scalera, Eleonora Maset, Alessandro Gasparetto)</i></p> <p>12:42 - 13:00 Novel Approaches for Periodic Depth Enhancement in Visual SLAM <i>(Stephan Sandfuchs, Marco Schmidt, Joerg Frochte)</i></p>
13:00	14:00	Lunch	
14:00	14:15	Change of location	
14:15	15:00	Lab Tour at JOANNEUM RESEARCH ROBOTICS and drone flight hall of University of Klagenfurt (AAU)	
15:00	15:15	Change of location	
15:15	15:30	Coffee Break	
15:30	17:00	<p style="text-align: center;">S6a: Assistive and Medical Robots</p> <p>Tadej Petric</p> <p>15:30 - 15:48 Research and control of wearable robot for wrist rehabilitation <i>(Denis Chikurtev, Petko Stoev)</i></p> <p>15:48 - 16:06 Geometric modeling of a new modular spherical robotic system for Single Incision Laparoscopic Surgery <i>(Calin Vaida, Iosif Birlescu, Alexandru-Vasile Pusca, Bogdan Gherman, Paul Tucan, Alexandru Antal, Doina Pisla)</i></p> <p>16:06 - 16:24 On the kinematics and dimensional optimization of a robotic system for Single Incision Laparoscopic Surgery <i>(Bogdan Gherman, Paul Tucan, Calin Vaida, Nicolae Crisan, Gabriela Rus, Iosif Birlescu, Doina Pisla)</i></p> <p>16:24 - 16:42 Inverse dynamic modeling of a parallel elbow rehabilitation robot for spasticity treatment <i>(Alexandru Banica, Bogdan Gherman, Nicoleta Tohanean, Adrian Pisla, Cristian Abrudan, Giuseppe Carbone, Doina Pisla)</i></p>	<p style="text-align: center;">S6b: Autonomous Mobile Manipulation</p> <p>Andreas Müller</p> <p>15:30 - 15:48 Analysis of Object Detection under Different Weather Conditions in Simulated and Real Environment <i>(Pragati Jaiswal, Axel Vierling, Karsten Berns)</i></p> <p>15:48 - 16:06 Putting Mobile Robots into Industrial Warehouses <i>(Dario Lodi Rizzini, Stefano Caselli)</i></p> <p>16:06 - 16:24 Passive Guidance for Offroad-Vehicles <i>(Werner Bailer, Hermann Fürntratt, Manfred Klopschitz, Dominik Lampel, Roman Lesjak, Matthias Rüther, Susanne Schweitzer, Gerald Steinbauer-Wagner)</i></p> <p>16:24 - 16:42 Computer Vision Based Object Tracking for Multiple Robot Collaboration <i>(Denis Chikurtev, Kaloyan Yovchev)</i></p> <p>16:42 - 17:00 The AMADEE-20 Robotic Exploration Cascade: An Experience Report <i>(Hamid Didari, Matthias Eder, Gernot Grömer, Richard Halatschek, Seda Özdemir-Fritz, Raphael Prinz, Johannes Scholz, Gerald Steinbauer-Wagner)</i></p>
17:00	19:00	Break	
19:00	19:15	Boarding for Wörthersee ship	
19:15	20:00	Gala Dinner at the ship	

Programm Friday 10/06/2022

08:30	09:45	S7a: Humanoids, Legged and Bioinspired Robots Nikos Aspragathos 08:30 - 08:48 Garment type agnostic robotic unfolding of garments from random configuration <i>(Dimitra Triantafyllou, Nikos Aspragathos)</i> 08:48 - 09:06 Phase state system for generating interactive behaviors for humanoid robots <i>(Tadej Petric, Leon Žlajpah)</i> 09:06 - 09:24 Multi-contact Stability of Multi-Legged Robots Operating in Unstructured Terrains <i>(Parastoo Dastango, Alex Ramirez-Serrano)</i> 09:24 - 09:42 SnakeTrack, a bio-inspired, single track mobile robot with compliant vertebral column for surveillance and inspection <i>(Shahab Edin Nodehi, Luca Bruzzone, Pietro Fanghella)</i>	S7b: Collaborative Robotics Gerald Steinbauer-Wagner 08:30 - 08:48 An Investigation of the Measurement of Transient Contacts in Human-Robot Interaction <i>(Clara Fischer, Martin Steiner, Michael Neuhold, Maximilian Papa, Alexandra Markis, Sebastian Schlund)</i> 08:48 - 09:06 Development of a Human-Robot Interface for a Safe and Intuitive Telecontrol of Collaborative Robots in Industrial Applications <i>(Andrea Raviola, Alberto Coccia, Andrea De Martin, Antonio Carlo Bertolino, Stefano Mauro, Massimo Sorli)</i> 09:06 - 09:24 Application of Model Predictive Control in Physical Human-Machine Interaction <i>(Maria Paterna, Daniel Pacheco Quiñones, Carlo De Benedictis, Daniela Maffiodo, Walter Franco, Carlo Ferraresi)</i> 09:24 - 09:42 Evaluation of FMCW Radar for Potential Use in SSM <i>(Peter Nimac, Tadej Petric, Andrej Krpič, Andrej Gams)</i>
09:45	10:10	Coffee Break	
10:10	11:25	S8a: Humanoids, Legged and Bioinspired Robots Doina Pişla 10:10 - 10:28 The use of robots in aquatic biomonitoring with special focus on biohybrid entities <i>(Wiktoria Rajewicz, Thomas Schmickl, Ronald Thenius)</i> 10:28 - 10:46 Four-legged walking-robot turning and steering using phase control <i>(Izhak Bucher)</i> 10:46 - 11:04 Finding Optimal Placement of the Almost Spherical Parallel Mechanism in the Recupera-Reha Lower Extremity Exoskeleton for Enhanced Workspace <i>(Ibrahim Tijjani)</i>	S8b: Collaborative Robotics Kosta Jovanovic, Nicole Duller 10:10 - 10:28 On the Methodologies to Compute Minimum Jerk Trajectories and their Application in Collaborative Robotics <i>(Rafael A. Rojas, Renato Vidoni)</i> 10:28 - 10:46 Development of a Virtual Reality application for the assessment of Human-Robot Collaboration tasks <i>(Giacomo Palmieri, Cecilia Scoccia, Daniele Costa, Massimo Callegari)</i> 10:46 - 11:04 Robots are Actor-Networks: Awareness, Bottom-Up Ethics, and Transforming Responsibility <i>(Nicole Duller)</i> 11:04 - 11:22 Assessment of the human-robot collaborative polishing task by using EMG sensors and 3D pose estimation <i>(Milos Petrovic, Arso Vukicevic, Branko Lukić, Kosta Jovanovic)</i>
11:25	11:45	Award Ceremony	