ReMAR 2024 Program Plan

All time is CST, Chicago time

June 23, Sunday		
5-8pm	Registration	
5-8pm	Light Reception	
8-9pm	**Session S-1 Reconfigurable Parallel Robots I (online 6 papers)** **Session Chairs: Duanling Li, Shanzeng Liu**	
	Kinematic Analysis, Control and Motion Planning of a Redundant (6+3)-DOF Hybrid Parallel Robot	Ramin Ghaedrahmati, Simon Foucault, Clement Gosselin*
	Dynamic Characteristics Analysis of the 3-(PRPR)RS Parallel Manipulator	Shanzeng Liu*
	Kinematic Analysis and Dimensional Synthesis of a Reconfigurable Parallel Mechanism for Wine Box Production	Lei Zhang, Ruiqin Li*
	Configuration Change and Kinematics Analysis of a Novel Reconfigurable Parallel Mechanism with Metamorphic Joint	Yutong Yuan, Duanling Li*
	Conformational Design and Kinematic Analysis of a Reconfigurable Ankle Rehabilitation Robot	Jun Wei, Haidong Ni, Jianjun Zhang*
	A Target Pose Optimization Strategy for Shipborne Stabilizing Platforms in Complex Maritime Conditions	Hengchun Cui, Jun Wu*, Jiayue Zhang
9-10pm	**Session S-2 Reconfigurable Parallel Robots II (online 6 papers)** **Session Chairs: Fugui Xie, Hassen Nigatu**	
	Simplifying Dynamic Models for Parallel Robots by Introducing Virtual Degrees of Freedom	Zhou Zhou, Clement Gosselin*
	Kinematics, Singularity and Workspace Analysis of a Reconfigurable Parallel Mechanism for Large Scale Assembly	Yanqin Zhao*, Wen Zhao, Yan Jin, Mingkun Wu
	A Model-Based Prediction Approach for Frequency Response Function of a Magnetic Adsorption Machining Robot	Zijian Ma, Fugui Xie*, Xin-Jun Liu
	Kinematic Design and Simulation of a Novel Three Limbs 5-DOF Parallel Robot for Reconfigurable Manufacture	Zhili Niu, Kaixuan Chen*, Panfeng Wang, Tao Sun
	Scale Optimization of the 7SPS Parallel Mechanism with Fewer Active Inputs Than the DOFs	Yu wang, Can Qiu, Jiabin Wu, Yundou Xu*, Yongsheng Zhao
	The Stiffness of 3-PRS PM across Parasitic and Orientational Workspace	Hassen Nigatu, Jihao Li, Gaokun Shi, GuoDong Lu, Huixu Dong, Junhan Zhang, Doik Kim*

June 24, Monday		
7:30-9:30am	Registration	
7:30-8:30am	**Session 1-1 Reconfigurable Mobile Robots (online 5 papers)** **Session Chairs: Ruiqin Li, Jieyu Wang**	
	Design and motion analysis of a snake robot with serial and parallel motion modes	Yinjun Zhao, Liqian Zhao, Yingzhong Tian, FengFeng Xi, Alessandro Cammarata, Pietro Davide Maddio, Rosario Sinatra, Jieyu Wang*
	Mechanical Design and Fluid Dynamics Simulation of a Reconfigurable Hybrid Aerial Underwater Vehicle	Lei Yan, Ao Cao, Xinyuan Zhu, Hongbo Ding, Sheng Guo, Guangrong Chen*
	Configuration Innovation and Stability Analysis of a Hexapod Load-Bearing Mountain Climbing Robot XuanGui	Ruiqin Li*, Chunzhen Wang, Weiwei Hu
	Design and Analysis of a Metamorphic Hexapod Robot for Inspecting Curved Cavities Inside the Aircraft	Qixiang Zhao, Chunzheng Wang, Jin Zhang, Wei Wang*, Yangmin Li
	A Low Rotational Inertia Reconfigurable 3D Thrust Vector Leg Mechanism for Legged Robot Capable of Omnidirectional	Yuze Xu, Shanjun Chen*, Zhongyue Lu, YIMING Zhu, Zirong Luo
8:30-9:30am	**Session 1-2 Mobile Robot Control (online 5 papers)** **Session Chairs: Lei Guo, Zheming Zhuang**	
	Research on Attitude and Control of a Bionic Manta Robot	Yuntao Guan, Aihu Jia, yongxi Liu, jianyang Liu, zheming Zhuang*, Jian Dai
	Implementation of Coordinated Circular Motion for Two Mobile	Hongyu Lin, Lei Guo*, Yuan Song, Dongming Gan
	Learning a Safe Driving Policy for Urban Area from Real-World	Adil Mahmud*, Changcheng Huang

	Tracking Control of Two Mobile Robots in Leader-Follower Mode Based on Terminal Sliding Mode Method	Yuqing Zhang, Lei Guo*, Yuan Song
	Short Inter-robot Distance Following Based on Collision-free Nonlinear Model Predictive Control	Xijie Lin, Yuan Song*, Lei Guo
9:30-9:35am	Openning Remarks	
9:35-10:35am	**Keynote Speech (Prof. Jian Dai)** **Session Chair: Spencer Magleby**	
10:35-10:50am	Coffee break	
10:50-12:10pm	**Session 1-3 Reconfigurable Linkages (hybrid 7 papers)** **Session Chairs: Mark Plecnik, Volkert van der Wijk**	
	Output Mode Switching for Parallel Five-Bar Manipulators Using a Projection-Based Direct Collocation Method	Shashank Ramesh, Patrick M. Wensing, Mark Plecnik*
	Motion Mode Analysis of a Variable-DOF 8R Spatial Mechanism Composed of Four Plane Symmetric RRR Triads	Xianwen Kong*
	Self-Aligning Rotational Latching Mechanisms: A Framework Extension for Orientations & Fast Latching	Gabriel Ikaika Fernandez*, Hyunwoo Nam, Ruochen Hou, Kyle Gillespie, Dennis Hong
	Mobility, Singularity and Configuration Analysis of a Bennett-Based Reconfigurable 8R Linkage	Hanzhang Yin, Wanhe Yu, Shengnan Lyu*, Xilun Ding
	Robot Links: towards self-assembling truss robots	Philippe Martin Wyder*, Quinn Alexander Booth, Riyaan Bakhda, Meiqi Zhao, …. Hod Lipson
	A Novel Morphing Quadrotor UAV with Sarrus-Linkage-Based Reconfigurable Frame	Yan Wang, Chen Liu, Ketao Zhang*
	Kinetic-Geometric Synthesis of a Reconfigurable 4R Four-Bar Multitask Mechanism	Volkert van der Wijk*
12:10-1:20pm	Lunch	
1:30-2:30pm	**Keynote Speech (Prof. Greg Chirikjian)** **Session Chair: Philip Voglewede**	
2:30-3:15pm	**Session 1-4 Origami Modeling (in-person 4 papers)** **Session Chairs: Jared Butler, Spencer Magleby**	
	The Surrogate Fold Catalog: A Design Tool for Origami-Inspired Mechanical Systems	Ivy Running*, Phebe Ramsdell, Carolina Wright, Spencer Magleby
	Kinematic Modeling of a Flat-foldable Auxetic Metamaterial	Huijuan Feng, Wujie Shi, Pino Trogu*, Jian Dai
	On the Singularity Analysis of Origami Using Graph and Screw Theories	Carlos Humberto Pinzón, Cuta*, Neider Romero Nunez, Marina Baldissera de Souza, Jing-Shan Zhao, Daniel Martins
	A Methodology for Designing and Improving Novel Kirigami Patterns Using the Hamiltonian Circuit Framework	Nathan Coleman, Spencer Magleby*, Denise Halverson, Zhong You, Larry L. Howell
3:15-3:30pm	Coffee break	
3:30-4:20pm	**Session 1-5 Cable-Driven Parallel Robots (in-person 5 papers)** **Session Chairs: Patrice Lambert**	
	Wrench generation of Cable-Driven Parallel Robots with on-board Thrusters: Feasibility Analysis & Available Wrench Set	Gino INNERO*, Darwin Lau
	Design and Prototyping of a Cable-Driven Parallel Robot with a Reconfigurable Moving-Platform for Pick-And-Place Operations	Camillo Murgia*, Philip Long, Stéphane Caro
	Cable Tension Optimization for Planar CDPR through Anchor Reconfiguration	Lei Jin, Dongming Gan*, Ahmad AlAttar,Tarek Taha,Maitha AlQaydi,Mohamed Abduljawad,Yahya
	Motion Control of a Cable-Driven Parallel Robot Using Reinforcement Learning Deep Deterministic Policy Gradient	Pegah Nomanfar*, Leila Notash
	Shared Workspace and Cable Interference between Point-Mass Cable-Driven Parallel Robots	Patrice Lambert*, Christos Bergeles
4:30-5:40pm	Dinner	
5:45-9:45pm	Shuttle bus to Chicago 1.5-hour river cruise	

June 25, Tuesday	
	Session 2-1 Mechanism Synthesis (online 6 papers) **Session Chairs: Fang Wan, Xuegang Li**

7:30-8:30am	Synthesis and Optimization of Contact-Aided Compliant Mechanisms with Prescribed Nonlinear Curve	Shenyuan Dai*, Yiran Wang, Guangbo Hao, Lifang Qiu
	Active Surface with Passive Omni-Directional Adaptation for In-Hand Manipulation	Sen Li, Fang Wan*, Chaoyang Song
	Type Synthesis of Single-DOF Multi-Loop-Coupled Planar Continuum Morphing Mechanisms	Jieyu Wang, Yuxiang Li, Yingzhong Tian, FengFeng Xi, Guangbo Hao, Yinjun Zhao*
	Reconfigurable Deployable Network Mechanism Constructed by Bricard-Like Mechanisms	Xianhong Zhang, Yingzheng Song, ruiming li*, Yan-an Yao
	Fabric enables powerful and high-range reconfigurable actuation	Zhuang Zhang*, Genliang Chen, Hao Wang
	A Novel Analytical Method for Path Synthesis of Spherical Four-Bar Mechanism Based on Fourier Series	Xuegang Li*, Anyu Shi, Liyan Feng, Ying Zhang
8:30-9:30am	**Session 2-2 Metamorphic Morphying Mechanisms (online 6 papers) Session Chairs: Zhibin Song, Xi Kang**	
	A Bionic Morphing Tail Mechanism for Aerial Vehicles	Jinghu Li, Han-Lin Sun, Ysé de Reydet de Vulpillières, Jing-Shan Zhao*, Wang Zhenya
	A Novel Single-Loop Multiple Metamorphic Mechanism Inspired by Thick-Panel Origami	Yuyao Chen, Xi Kang*, Bing Li
	A 6R Metamorphic Mechanism with a Novel Variable-Axis Joint	Ruixin Ba, Xi Kang*, Bing Li
	Design and Kinematics Characteristics Analysis of an Extendable Arm and Deployable Antenna	Jiaxu Han, Paolo Dario, Jian Dai, Rongjie Kang, Zhibin Song*
	Homogeneous Module Unit Morphology Optimization and Design for On-Orbit Services	Xiongjun Song*, Gang Chen, Hanxu Sun, Xiaokang AN, Zhengyu Liang
	Design of a Torque-Resistant Continuum Origami Robot Module with Embedded Frame	YINAN SUN*
9:45-10:45am	**Keynote Speech (Prof. Mark Yim) Session Chair: Daniel Martins**	
10:45-11am	Coffee break	
11-12:20pm	**Session 2-3 Reconfigurable Mechanisms (hybrid 7 papers) Session Chairs: Hai-Jun Su, Jin Xie**	
	Compliant Spherical Joint Design for Reconfiguration of Variable Topology Truss	Hyeongyu Yoon, Jangho Bae, Haorui Li, TaeWon Seo, Mark Yim*
	A Geometric Approach for the Bifurcation Modeling and Analysis of Plane-Symmetric Bricard Mechanisms	Yuliang Lu, Siyue Yao, Yanjun Wang, Hao Wang, Genliang Chen*
	Enumerating Deformed Configurations of Reconfigurable Meshed Cellular Robots	Sabyasachi Dash*, Girish Krishnan
	Design and Modeling of Spatial Parasitic Motion Compensation Structures Supporting Triaxial Compliant Positioning Stages	Jian Yang, Peng Yan*
	An Efficient Design Model for Parallel-Guided Layer Jamming Compliant Mechanisms	Xianpai Zeng, Hai-Jun Su*
	Bat Feet-Inspired Gripper: Design and Kinematic Analysis of a Metamorphic Docking Mechanism	Jiabao Li, XueYing Jin, Guiyu Dong, Kun Xu, Yaobin Tian, Xilun Ding*
	Phase-Stabilization of Reconfigurable Spherical Joint in a Metamorphic Spatial Parallel Mechanism	JIN XIE*
12:20-1:30pm	Lunch	
1:30-2:30pm	**Session 2-4 Compliant Mechanisms (in-person 5 papers) Session Chairs: Jovana Jovanova, A B M Tahidul Haque**	
	Synthesis of Superelastic Compliant Mechanisms for Target Shape Matching	Brianne Hargrove*, Jovana Jovanova, Mary Frecker
	An Asynchronous Kalman Filter-Based State Estimation Approach for Rigid-Flexible Link Robotic Manipulators	Farshad Nozad Heravi*, Hoomaan MoradiMaryamnegari, Lizhou Xu, Mariapaola D'Imperio, Gabriele Marchello, Ferdinando Cannella
	Tri-Sphero Bot: A Modular Compliant Unit with Spherical Wheels	Tejas Shintre*, Abhishek Gupta, Leena Vachhani
	Reprogrammable mechanics via individually switchable bistable unit cells in a prestrained chiral metamaterial	Jordan Raney*, A B M Tahidul Haque, Samuele Ferracin

	De-Dimensionalization and Scaling for the Dynamic Analysis and Optimization of Compliant Mechanisms	Vivien Platl*, Lena Zentner
2:30-3:30pm	**Session 2-5 Reconfigurable Mobile Robots (in-person 5 papers) Session Chairs: Bashar El-Khasawneh, Tomasz Buratowski**	
	Vibrating Particle Robot	Richa Batra*, Philippe Martin Wyder, Pranav Jhunjhunwala, Quinn Alexander Booth, Aaron Xie, Brian Small, Hod Lipson
	Towards Zero Accidents: Innovative Safety Strategies in Last Mile Vehicle Engineering	Qi Kong, Henry Zhang*, Linda L Naimi
	Resampling Strategies for Increasing Point Density in Narrow Passages for Probabilistic Roadmaps	Bartłomiej Bonar*, Tomasz Buratowski
	Hybrid Locomotion of a Mobile Parallel Robot with a Minimal Number of Motors	Bashar El-Khasawneh*, Abdur Rosyid
	Re-Examining Climbing Robots: Design and Performance of a Lightweight, Low-Cost Robot with a Highly Extendable Limb	Justin Quan*, Dennis Hong, Mingzhang Zhu
3:30-3:45pm	Coffee break	
3:45-4:45pm	**Session 2-6 Reconfigurable Soft Robots (in-person 6 papers) Session Chairs: Xin Ma, Sunghwan Lee**	
	Soft Robotics for Fall Mitigation: Preliminary Design and Evaluation of a Wearable System using Continuum Robots	Param Malhotra, Nithesh Kumar, Chase Frazelle, Ian Walker, Ge Lv*
	Miniature Reconfigurable Modular Soft Robots Using Liquid Crystal Elastomer Actuation	Huayu Zhang, JIAJUN AN, Tianle Flippy Pan, UPINDER KAUR, Zhijian Wang, Qiguang He, xin ma*
	Modeling Programmable Deformation of Particle-Based Structure with Smart Hydrogels	Qianyi Chen*, Tarish Kalpoe, Jovana Jovanova
	Mold-Free, Custom-Designed, and Property-Engineered Manufacturing of Haptic Sensors for Soft Robotics	Jinwook Baek, Mitesh Mylvaganan, Han Wook Song, Min-Seok Kim, Sunghwan Lee*
	Shape referencing in reconfigurable beams using liquid crystal elastomers	Lance Hyatt, Christopher Bentley, Philip Buskohl, Ryan Harne, Jared Butler*
	Autonomous locomotion in a crawling soft robot using liquid crystal elastomers	Lance Hyatt, Philip Buskohl, Ryan Harne, Jared Butler*
4:45-5pm	Group photo	
5-6pm	Suggested local walk (churches, houses, beach)	
6-8pm	Banquet and Award	

June 26, Wednesday		
7:30-8:30am	**Session 3-1 Adaptable Robots (online 6 papers) Session Chairs: Sicong Liu, Chaoyang Song**	
	Evolutionary Morphology towards Overconstrained Locomotion Via Large-Scale, Multi-Terrain Deep Reinforcement Learning	Yenan Chen, Chuye Zhang, Pangxi Gu, Jianuo Qiu, Jiayi YIN, Nuofan Qiu, Guojing Huang, Bangchao Huang, Zishang Zhang, Hui Deng, Wei Zhang, Fang Wan, Chaoyang Song*
	A Novel Bio-Inspired Quadruped Crawling Robot with Movable Waist	Ruiqin Wang*, Hao Wu, Jian Dai
	CAD-based Workspace Analysis of a 6-DOF Foldable Parallel Manipulator with a Circular Rail (FoldRail Manipulator)	Sergei Kiselev, Alexey Fomin*, Anton Antonov
	Design, Mobility and Kinematic Analysis of a 4-DOF 3R1T Redundantly Actuated Foldable Parallel Manipulator with a	Ilya Brem, Pavel Laryushkin, Alexey Fomin*, Anton Antonov
	A Multi-Facet-Effector Soft Robot in Polyhedral Configuration for Multidirectional Function Reuse	Yige Wu, Xiaohuang LIU, Shaowu Tang, Sicong LIU*, Juan Yi, Zheng Wang, Jian Dai
	Basic investigations on a compliant 2D tensegrity grid for the use in soft robotic applications	David Herrmann*, Leon Schaeffer, Lukas Lehmann, Valter Boehm, John Rieffel
	Session 3-2 Flexible Robots (online 6 papers) Session Chairs: Jing-Shan Zhao, Zirong Luo	
	Kinematic and Static Analysis of a Coupled-Input Cable-Driven Force Feedback Master Manipulator	Panfeng Wang, Jiaxing Li, Shibo Liu*

8:30-9:30am	Tension Optimization of a Cable-driven Robot by Screw Statics	Jing-Shan Zhao*, Han-Lin Sun, Xiaocheng Sun, Anuar Santoyo Alum
	Design of High Efficiency Bio-Inspired Hydraulic Actuator for Wearable Robotic System	Xiangjuan Bai, Zhongyue Lu, Tao Jiang, Minghai Xia, Yuze Xu, Zirong Luo*
	Flexible Wing Dynamics of an Underwater Gliding Robot	Aihu Jia, Rui Sun, Yuntao Guan, Xiaobin Qin, yongxi Liu, Shangkui Yang, zheming Zhuang, Rongjie Kang*, Jian Dai
	Kinematic Calibration for a Large Hybrid Spraying Robot Considering Gravity Deformation	Xiaojian Wang*, Jun Wu (China) 387681*, 130851
	Thrust-Velocity Characteristics of a Variable Composite Wave Driven Bionic Undulating Propeller	Minghai Xia, Zirong Luo*, Qian Yin, Qunwei Zhu, Yuze Xu, Xiangjuan Bai
9:45-10:45am	**Keynote Speech (Prof. Hod Lipson)** **Session Chair: Haijun Su**	
10:45-11am	Coffee break	
11-12:20pm	**Session 3-3 Reconfigurable Hybrid/Redundant Robots (hybrid 7 papers)** **Session Chairs: Fengfeng Xi, Spencer Magleby**	
	Application of Mechanisms to Aircraft Flexible Trailing Edge Design	FengFeng Xi, Stefan Kojovic*, Octavio Guerra, Donatus Oguamanam
	Design and Analysis of a Novel Reconfigurable Integrated Leg-Arm Robot	Xinghan Zhuang, Jinyu Ma, zhijun zhao, Yaobing Wang, Jiawei Chen, Yaobin Tian, Kun Xu*, Xilun Ding
	A Review and Discussion of Metrics for Origami-Based Deployable Arrays	Katie Varela*, Brooklyn Clark, Spencer Magleby (USA) 388074*, 388079, 387760
	Two-Stage Origami-Based Vibration Isolators with High-Static-Low-Dynamic-Stiffness Characteristics	Shiwei Liu, Shengnan Lyu*, Qiuyue Zheng, Xilun Ding
	Optimal Design of a Mobile Spray-Painting Robot Based on Dynamic Fluctuation Performance	Ruijie Zhang* (China) 386685*
	Sensor Fusion-Based Parameterized Curve-Driven Modeling for Digital Twin of Reconfigurable Soft Robot	ZHONGYUAN LIAO, WANZHEN WEI, Leihan ZHANG, Yi Cai*
	Search-Based Motion Planning with Task-Space Motion Primitives for Hyper-Redundant Manipulators in Cluttered Environment	Jiangping Wang*, rui Miao, jia Ma, hang Shi
12:20-1:30pm	Lunch	
1:30-2:30pm	**Session 3-4 Metamorphic Robotic Grippers (in-person 5 papers)** **Session Chairs: Yu She, Brian Slaboch**	
	Adaptive Impedance Control of a Three-Fingered Deployable Metamorphic Robotic Grasper	Changqing Gao, yuanfeng huang, Jixue Mo, Fei Liu, Yongjie Zhao, Xin Wang*
	Reconfiguration of Modular Hyper-Redundant Manipulators Via Normalised Manipulability, Workspace Density, and Workspace Volume Percentage Indices	Daniele Ludovico*, Alessandro Pistone, Lorenzo De Mari Casareto Dal Verme, Ardit Poka, Federico Manara, Giovanni Berselli, Darwin G. Caldwell, Carlo Canali
	Kinematics and Configuration Analysis of a Five-Fingered Metamorphic Robot Hand	Heming Liu, Henry Zhang*
	Metamorphic Robotic Gripper for Industrial Applications	Kenzie Swinford, Brian Slaboch*
	Mathematical Modelling of a Four-Fingered Metamorphic Anthropomorphic Hand on Precision Grasp	Tun Wang*, Yen-Hua Lin, Jian Dai
2:30-3:10pm	**Session 3-5 Reconfigurable Systems (in-person 4 papers)** **Session Chair: Zhuming Bi, Winston Sealy**	
	Collaborative Human and Computer Controls of Smart Machines: Literature Review	Zhuming Bi*
	Reconfigurable Service Robotic System to Tackle Multiple Applications in Medical Sector	Shreyas Maheshkumar Patel*, Ekta Singla, Ashish Singla
	Virtualized Digital Twin (DT) of a Reconfigurable Programmable Logic Controller (PLC)	Khalifa Alremeithi*,Hassan Almaeeni,Winston Sealy
	Achievement of automatic nylon rope winding control using adaptive decision making algorithm	Hsiung-Cheng Lin*, Yan-Hao Peng, Hong-Jun Xu, Zhi-Xuan Xu
	End of the Conference	