

ReMAR 2018 – Full Program

Tuesday 19 June 2018

20:00 – 22:00 Registration Lagerhuysch

Wednesday 20 June 2018

8:30 Registration Foyer

9:00 Opening Session Lecture Room A

9:30 **Strandbeest: The Creation of New Forms of Life**
Keynote lecture by Theo Jansen Lecture Room A

10:30 Fast Forward Session I Lecture Room A
Session Chair: Matteo Zoppi

- 77 A Reconfigurable Asymmetric 3-UPU Parallel Robot**
Soheil Sarabandi, Patrick Grosch, Josep M. Porta and Federico Thomas

- 15 Classification, Collection, and Simulation of Folding Mechanisms**
Jascha Paris, Judith Merz, Henri Buffart, Susanne Hoffmann, Chantal Weigel,
Mathias Hüsing, Martin Trautz and Burkhard Corves

- 25 Group Method for Synthesis of Metamorphic Parallel Mechanism with 1R2T and 2R1T
Reconfiguration**
Jun Wei and Jian S. Dai

- 9 Double Bennett Mechanisms with Assembly Modes of Different Dimensions**
Jon Selig and Zijia Li

- 39 Motion Synthesis in Tensegrity Mechanisms**
Pramod K. Malik, R. Rajput, Anirban Guha and P. Seshu

- 59 Analysis of a Functionally Graded Compliant Mechanism Surgical Grasper**
Jovana Jovanova, Angela Nastevska, Mary Frecker and Milton E. Aguirre

- 23 A Bistable Underactuated Finger with Reconfigurable Grasping Modes**
Carl A. Nelson

- 50 A Planar Mechanism with Variable Topology for Automated Fiber Placement**
Fei Liu, Wuxiang Zhang, Kun Xu, Huichao Deng and Xilun Ding

- 40 Modified Material Properties in Curved Panels Through Lamina Emergent Torsional
Joints**
Trent Zimmerman, Jared Butler, Dallin Frandsen, Dakota Burrow, David Fullwood,
Spencer Magleby and Larry Howell

72 **Self-aligning Analysis of the Metamorphic Palm of the KCL/TJU Metamorphic Hand**
 Rodrigo L. P. Barreto, Andrea P. Carboni, Roberto Simoni, Daniel Martins and Jian S. Dai

53 **Reconfiguration Analysis of a Variable Degrees-of-freedom Multi-mode Parallel Manipulator**
 Xianwen Kong, Jieyu Wang, Jingjun Yu and Duanling Li

34 **A Tromino Tiling Theoretic Approach to Path Planning in a Reconfigurable Floor Cleaning Robot**
 Prabakaran Veerajagsdheswar, Mohan Rajesh Elara, Pathmakumar Thejus and Sivanantham Vinu

p.o. Soft Robotics Challenge
 Jamie Paik

11:30 – 13:00 Interactive Session I Lagerhuysch
 Session Chair: Ferdinando Cannella

All presenters of Fast Forward Session I

13:00 Lunch served by Foodtruck KoKo LoCo Outside at Lagerhuysch

14:30 **A Classification of the Scissor Linkages Based on the Loop Assembly Method**
 Keynote lecture by Gökhan Kiper Lecture Room A

15:30 Fast Forward Session II Lecture Room A
 Session Chair: Shaoping Bai

11 **Implementation of Rolling Contacts for SORCE Joints**
 Todd G. Nelson, Robert J. Lang, Spencer P. Magleby and Larry L. Howell

45 **Kinematics of a Novel 3-URU Reconfigurable Parallel Robot**
 Luca Carbonari, David Corinaldi, Giacomo Palmieri and Matteo-Claudio Palpacelli

64 **Design and Motion Analysis of Compliant Omni-directional Spherical Modular Snake Robot (COSMOS)**
 Akash Singh, Anshul Paigwar, Sai Teja Manchukanti, Manish Saroya and Shital Chiddarwar

13 **A Single-Loop 8R Linkage with Plane-Symmetry and Bifurcation Property**
 Xuheng Chai, Chunsong Zhang and Jian S. Dai

52 **The Design of Ortho-Planar Spring for a Normally-Closed Gate Valve**
 Ruetai Graipaspong and Teeranoot Chanthasopeephan

12 **Synthesis of Discontinuously Movable Mechanisms with Bifurcation**
 Tzu-Chin Lo, Tsung-Ni Yang and Jyh-Jone Lee

- 20 Dilational Triangulated Shells Using Pantographs**
Freek Broeren, Werner van de Sande, Volkert van der Wijk and Just L. Herder
- 24 Adaptive Soft Robotic Gripper Based on Shape Morphing Compliant System**
Andrija Milojević, Sebastian Linß, Žarko Čojbašić, Heikki Handroos, Lauri Luostarinen and Lena Zentner
- 74 Design of a Dynamically Reconfigurable 3T1R Parallel Kinematic Manipulator**
Juan de Dios Flores-Mendez, Henrik Schiøler, Ole Madsen and Shaoping Bai
- 71 Design and Analysis of a Metamorphic Quadruped Robot**
Kun Xu, Hanxin Ma, Jiawei Chen, Wuxiang Zhang, Huichao Deng and Xilun Ding
- 46 Optimization of the Reconfiguration Planning of Cyber-Physical Production Systems with Delta-Like Architecture**
Jan Brinker, Dominic Ring, Marco Lübbecke, Yukio Takeda and Burkhard Corves
- 44 Dynamic Modelling and Simulation of a Deployable Quadrotor**
Haohua Xiu, Tao Xu, Anthony H. Jones, Guowu Wei, Lei Ren and Jian S. Dai
- p.o. Giorgio Scarpa's Transformable Objects: Geometry as Art, Science, and Play**
Pino Trogu

16:30 – 18:00 Interactive Session II
Session Chair: Daniel Martins
Lagerhuysch
All presenters of Fast Forward Session II

18:00 Walk to Delft City Hall Meeting point / leaving from Foyer
18:30 – 20:00 Welcome Reception Delft City Hall

Thursday 21 June 2018

9:00 **Shape-programmable Magnetic Soft Milli/Microrobots**
Keynote lecture by Metin Sitti Lecture Room A

10:00 Fast Forward Session III
Session Chair: Federico Thomas Lecture Room A

- 68 A Symbolic-Numeric Method to Capture the Impact of Varied Geometrical Parameters on the Translational Workspace of a Planar Cable-Driven Parallel Robot**
Felix Trautwein, Philipp Tempel and Andreas Pott
- 33 Design and Application of a 3-DoF Manipulator for Launch and Recovery System**
Yan Peng, Haijun Chen, Bizhou Lu and Yi Yang

- 10 Auxetics Abounding**
Ciprian S. Borcea and Ileana Streinu
- 38 Design of the Planar Compliant Five-bar Mechanism for Self-aligning Knee Exoskeleton**
Yijun Niu, Zhibin Song and Jian S. Dai
- 60 PASCAL Gripper: a Pneumatically Actuated Soft Cubical Vacuum Gripper**
Ahmad M. Tahir, Giovanna A. Naselli and Matteo Zoppi
- 16 A 3-RRR Spherical Parallel Manipulator Reconfigured with Four-bar Linkages**
Guanglei Wu, Huimin Dong, Delun Wang and Shaoping Bai
- 54 Compliance Synthesis of a Class of Planar Compliant Parallelogram Mechanisms Using the Position Space Concept**
Guangbo Hao, Jingjun Yu and Yufei Liu
- 49 An Application of the Simultaneous Localization and Mapping (SLAM) Method Based on the Unscented Kalman Filter (UKF) to a Reconfigurable Quadraped Robot with Crawling Locomotion**
Takuma Nemoto, Keichi Onodera, Rajesh Elara Mohan, Masami Iwase and Kristin Wood
- 35 A Shape-Adaptive Mechanism with SMP Jointed Panels - Preliminary Study**
Aaron Yu, Fengfeng (Jeff) Xi and Bing Li
- 55 A 2-DOF Deployable Planar Mechanism with Continuous Rotation Characteristics**
Ziming Chen, Xuedan Wei, Zhiwei Yang, Chen Zhao and Jieyu Wang
- 7 An Origami-based Thickness-accommodating Bistable Mechanism in Monolithic Thick-sheet Materials**
Nathan A. Pehrson, Spencer P. Magleby and Larry L. Howell
- 14 A Mapping Method of Grasping Posture Applying to the Metamorphic Multi-fingered Hand**
Yingce Zheng, Zhao Tang and Jian S. Dai
- p.o. Foldable Travel Guitar**
Patrick Snels

11:00 – 12:30 Interactive Session III Lagerhuysch
Session Chair: Dongming Gan

All presenters of Fast Forward Session III

12:30 Lunch served by Rode Rozen & Tortilla's Foyer

12:30 – 14:00 Lab visits in small groups Foyer

- 8 Operation Mode and Workspace of a 3-rRPS Metamorphic Parallel Mechanism with a Reconfigurable Revolute Joint**
Latifah Nurahmi and Dongming Gan
- 6 Self-Calibration for an Object Integrative Handling System**
Tim Detert, Mathias Hüsing and Burkhard Corves
- 37 Reconfigurable Generalized Parallel Mechanisms with Coupling Sub-chains (with reservation)**
Chunxu Tian, Q. J. Ge and Yuefa Fang
- 58 Origami Carton Non-linear Multi-body Simulation towards Industry 4.0: Preliminary Study**
Mariapaola D’Imperio, Jian S. Dai, Darwin Caldwell and Ferdinando Cannella
- 48 sTetro: A Modular Reconfigurable Cleaning Robot**
Yuyao Shi, Mohan Rajesh Elara, Manivannan Kalimuthu and Manojkumar Devarassu
- 76 Modelling and Path Planning of Snake Robot in Cluttered Environment**
Akash Singh, Anshul Paigwar, Chaohui Gong and Howie Choset
- 17 Design and Workspace Analysis of Reconfigurable 3-RPRP Spherical Parallel Mechanisms**
Ruiqin Li, Jianwen Zhao, Dabao Fan, Shijie Liang, Shengtao Song and Shaoping Bai
- 65 Synthesis and Motion Analysis of a Single-Loop 8R-Chain**
Martin Pfurner
- 42 Reconfigurable Deployable Umbrella Canopies**
Radomir Jovichikj, Abdullah Yaşır and Gökhan Kiper
- 18 Permanent Preloading by Acceleration for Statically Balancing MEMS Devices**
Marije Y. Barel, Davood Farhadi Machekeposhti, Just L. Herder, Metin Sitti and Nima Tolou
- 57 The Double-Koenigs Mechanism - A Spatial Linkage with Cusp Singularities and Multiple Branches in the Configuration Space**
Pablo Lopez-Custodio, Andreas Müller and Jian S. Dai
- 21 Sensor-Driven Algorithm for Self-Reconfiguration of Modular Robots**
Jennifer E. Walter
- p.o. Analytical Models for Nonlinear Stiffness of Flexures & Large Stroke Flexure Joints for High Support Stiffness**
Dannis Brouwer, Marijn Nijenhuis and Mark Naves

p.o. Transforming Materials
Bas Overvelde

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| 15:00 – 16:30 | Interactive Session IV Session Chair: Fengfeng (Jeff) Xi | Lagerhuysch |
| | All presenters of Fast Forward Session IV | |
| 16:30 | Walk to the boats for the canal tour | Meeting point/leaving from Foyer |
| 17:00 – 18:00 | Delft canal tour by boat | Delft's canals |
| 18:00 – 18:15 | Walk to the Old Church | |
| 18:15 – 22:00 | Conference dinner | Old Church (Oude Kerk) of Delft |

Friday 22 June 2018

9:00 **Enabling Engineered Properties via Architected Materials**
Keynote lecture by Jonathan Hopkins Lecture Room A

10:00 Fast Forward Session V Lecture Room A
Session Chair: Xianwen Kong

22 An Approach to the Estimation of the Actuation Parameters for Mobile Tensegrity Robots with Tilting Movement Sequences
Philipp Schorr, Valter Böhm, Lena Zentner and Klaus Zimmermann

32 A Configuration-Independent Software Architecture for Modular Robots
Lars Grimstad and Pål Johan From

61 Synthesis of Reconfigurable Positioning Parallel Manipulator of a class RoboMech
Zhumadil Zh. Baigunchekov, Sayat Ibrayev, Myrzabai Izmambetov, Zhadyra Zhumasheva, Talgat Baigunchekov, Batyr Naurushev, Azamat Mustafa and Mukhagali Sagyntay

78 The Static Balancing of Single-loop Reconfigurable Mechanisms
Daniel Robertson, Chin-Hsing Kuo and Just Herder

43 Multistable Trusses of Nonlinear Morphing Elements
Chrysoula Aza, Alberto Pirrera and Mark Schenk

56 Experimental and Simulation study of Miniature Robot for Natural Orifice Transluminal Endoscopic Surgery
Sarvesh Saini and Pushparaj Mani Pathak

- 36 Zipper Tube Reinforcement to Mitigate Flexible Shaft Buckling**
Brandon Sargent, Maxwell Bean, David Wood, Brian Jensen, Spencer Magleby and Larry Howell
- 27 Anatomy Optimization and Experimental Verification of a Metamorphic Manipulator**
Eleftherios F. Katrantzis, Vassilis C. Moulianitis, Nikos A. Aspragathos and Charalampos D. Valsamos
- 29 A Metamorphic Hand with Coplanar Reconfiguration - Kinematics, Workspace, and Manipulation Analysis**
Xu Cui, Jie Sun, Xin S. Zhang, Shuang J. Xu and Jian S. Dai
- 30 Static Balancing of a Reconfigurable Linkage with Switchable Mobility by Using a Single Counterweight**
Chin-Hsing Kuo, Linh Nguyen-Vu, Lin-Tien Chou
- 62 A Dual Reconfigurable 4-rRUU Parallel Manipulator**
Abhilash Nayak, Stéphane Caro and Philippe Wenger
- 63 A Data-driven Motion Mapping Method for Space Teleoperation of Kinematically Dissimilar Master/Slave Robots (with reservation)**
Yang Lin, Huan Zhao, Yue Zhang and Han Ding
- p.o. Compliant Frequency Multiplier Transmission Mechanisms**
Davood Farhadi Machekposhti

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| 11:00 – 12: 30 | Interactive Session V Session Chair: Guangbo Hao | Lagerhuysch |
| | All presenters of Fast Forward Session V | |
| 12:30 | Conference Closure | Lecture Room A |
| 13:00 | Farewell Lunch | Foyer |
| 14:30 | After Conference Activities | Foyer |
