

Contents

Part I Modeling

The Forward Kinematics of Cable-Driven Parallel Robots with Sagging Cables	3
Jean-Pierre Merlet and Julien Alexandre-dit-Sandretto	
An Elastic Cable Model for Cable-Driven Parallel Robots Including Hysteresis Effects	17
Philipp Miermeister, Werner Kraus, Tian Lan and Andreas Pott	
On the Improvement of Cable Collision Detection Algorithms	29
Dinh Quan Nguyen and Marc Gouttefarde	
Workspace Analysis of Redundant Cable-Suspended Parallel Robots	41
Alessandro Berti, Jean-Pierre Merlet and Marco Carricato	
On the Static Stiffness of Incompletely Restrained Cable-Driven Robot.	55
Hui Li	
Simulation and Control with XDE and Matlab/Simulink of a Cable-Driven Parallel Robot (CoGiRo)	71
Micaël Michelin, Cédric Baradat, Dinh Quan Nguyen and Marc Gouttefarde	

Part II Accuracy

Presentation of Experimental Results on Stability of a 3 DOF 4-Cable-Driven Parallel Robot Without Constraints	87
Valentin Schmidt, Werner Kraus and Andreas Pott	

Experimental Determination of the Accuracy of a Three-Dof Cable-Suspended Parallel Robot Performing Dynamic Trajectories.	101
Clément Gosselin and Simon Foucault	
Efficient Calibration of Cable-Driven Parallel Robots with Variable Structure	113
Dragoljub Surdilovic, Jelena Radojicic and Nick Bremer	
 Part III Control	
Robust Internal Force-Based Impedance Control for Cable-Driven Parallel Robots	131
Christopher Reichert, Katharina Müller and Tobias Bruckmann	
Adaptive Control of KNTU Planar Cable-Driven Parallel Robot with Uncertainties in Dynamic and Kinematic Parameters	145
Reza Babaghasabha, Mohammad A. Khosravi and Hamid D. Taghirad	
Dynamic Analysis and Control of Fully-Constrained Cable Robots with Elastic Cables: Variable Stiffness Formulation	161
Mohammad A. Khosravi and Hamid D. Taghirad	
Adaptive Terminal Sliding Mode Control of a Redundantly-Actuated Cable-Driven Parallel Manipulator: CoGiRo	179
Gamal El-Ghazaly, Marc Gouttefarde and Vincent Creuze	
Haptic Interaction with a Cable-Driven Parallel Robot Using Admittance Control	201
Wei Yang Ho, Werner Kraus, Alexander Mangold and Andreas Pott	
A Kinematic Vision-Based Position Control of a 6-DoF Cable-Driven Parallel Robot	213
Ryad Chellal, Loïc Cuvillon and Edouard Laroche	
Analysis of a Real-Time Capable Cable Force Computation Method	227
Katharina Müller, Christopher Reichert and Tobias Bruckmann	

First Experimental Testing of a Dynamic Minimum Tension Control (DMTC) for Cable Driven Parallel Robots	239
Saeed Abdolshah and Giulio Rosati	
Modeling and Control of a Large-Span Redundant Surface Constrained Cable Robot with a Vision Sensor on the Platform.	249
Amber R. Emmens, Stefan A.J. Spanjer and Just L. Herder	
 Part IV Application	
Cable Function Analysis for the Musculoskeletal Static Workspace of a Human Shoulder.	263
Darwin Lau, Jonathan Eden, Saman K. Halgamuge and Denny Oetomo	
A Reconfigurable Cable-Driven Parallel Robot for Sandblasting and Painting of Large Structures	275
Lorenzo Gagliardini, Stéphane Caro, Marc Gouttefarde, Philippe Wenger and Alexis Girin	
ARACHNIS: Analysis of Robots Actuated by Cables with Handy and Neat Interface Software	293
Ana Lucia Cruz Ruiz, Stéphane Caro, Philippe Cardou and François Guay	
Upper Limb Rehabilitation Using a Planar Cable-Driven Parallel Robot with Various Rehabilitation Strategies	307
XueJun Jin, Dae Ik Jun, Xuemei Jin, Jeongan Seon, Andreas Pott, Sukho Park, Jong-Oh Park and Seong Young Ko	
Erratum to: Haptic Interaction with a Cable-Driven Parallel Robot Using Admittance Control	E1
Werner Kraus, Alexander Mangold, Wei Yang Ho and Andreas Pott	
Author Index	323

Cable-Driven Parallel Robots

Proceedings of the Second International Conference on
Cable-Driven Parallel Robots

Pott, A.; Bruckmann, T. (Eds.)

2015, XI, 324 p. 162 illus., 135 illus. in color., Hardcover

ISBN: 978-3-319-09488-5