

Contents

On the Minimum 2-Norm Positive Tension for Wire-Actuated Parallel Manipulators	1
L. Notash	
Further Analysis of the 2-2 Wire-driven Parallel Crane	9
J-P. Merlet	
Some Rational Vehicle Motions	17
J. M. Selig	
Topological Representation and Operation of Motion Space Exchange Reconfiguration of Metamorphic Mechanisms	25
S. Li, H. Wang, J. Dai, X. Li, Z. Ren and S. Xiu	
Classification of Singularities in Kinematics of Mechanisms	33
S. Piipponen, T. Arponen and J. Tuomela	
Non-existence of Planar Projective Stewart Gough Platforms with Elliptic Self-motions Dedicated to Prof. H. Stachel on the occasion of his 70th birthday	41
G. Nawratil	
Direct Geometrico-Static Problem of Underconstrained Cable-Driven Parallel Robots with 5 Cables	49
C. Abbasnejad and M. Carricato	
Uniform and Efficient Exploration of State Space using Kinodynamic Sampling-based Planners	57
R. Motwani, M. Motwani and F. C. Harris Jr.	
Shape Modeling of Continuous-Curvature Continuum Robots	65
S. Bai	

Dimensional Synthesis of a Spatial Orientation 3-DoF Parallel Manipulator by Characterizing the Configuration Space	73
M. Urízar, V. Petuya, M. Diez and A. Hernández	
Self-Calibration of Redundantly Actuated PKM Exploiting Kinematic Landmarks	81
A. Müller and M. Ruggiu	
Solving the Forward Kinematics of Cable-Driven Parallel Robots with Neural Networks and Interval Arithmetic	89
V. Schmidt, B. Müller and A. Pott	
Three Types of Parallel 6R Linkages	97
Z. Li and J. Schicho	
Positioning two Redundant Arms for Cooperative Manipulation of Objects	105
A. Colomé and C. Torras	
A Sufficient Condition for Parameter Identifiability in Robotic Calibration	113
T. Gayral and D. Daney	
An improved Force Distribution Algorithm for Over-constrained Cable-driven Parallel Robots	121
A. Pott	
An Open-Source Toolbox for Motion Analysis of Closed-chain Mechanisms	129
L. Ros, J. M. Porta, O. Bohigas, M. Manibens, C. Rosales and L. Jaillet	
Spherical Parallel Mechanism with Variable Target Point	137
T. Ikeda, Y. Takeda and D. Matsuura	
A Blend of Delassus Four-bar Linkages	145
C-C. Lee and J. M. Hervé	
On the Symmetric Molecular Conjectures	153
J. M. Porta, L. Ros, B. Schulze, A. Sljoka and W. Whiteley	
Stiffness Modeling of Robotic Manipulator with Gravity Compensator ..	161
A. Klimchik, S. Caro, Y. Wu, D. Chablat, B. Furet and A. Pashkevich	
Computational Algorithm for Determining the Generic Mobility of Floating Planar and Spherical Linkages	169
O. Shai and A. Müller	
Determination of the Safe Working Zone of a Parallel Manipulator	177
R. A. Srivatsan and S. Bandyopadhyay	

Contents	ix
Certified Calibration of a Cable-Driven Robot Using Interval Contractor Programming	185
J. A. Sandretto, G. Trombettoni, D. Daney and G. Chabert	
Framework Comparison Between a Multifingered Hand and a Parallel Manipulator	193
J. Borràs and A. M. Dollar	
A Novel Mechanism with Redundant Elastic Constraints for an Actual Revolute Joint	201
D. Wang, Z. Wang, H. Dong and S. Yu	
Obtaining the Maximal Singularity-free Workspace of 6-UPS Parallel Mechanisms via Convex Optimization	209
A. Karimi, M. T. Masouleh and P. Cardou	
Type Synthesis of Two DOF Hybrid Translational Manipulators	217
L. Nurahmi, S. Caro and S. Briot	
Robust Dynamic Control of an Arm of a Humanoid using Super Twisting Algorithm and Conformal Geometric Algebra	225
O. Carbajal-Espinosa, L. González-Jiménez, A. Loukianov and E. Bayro-Corrochano	
Singularity Locus for the Endpoint Map of Serial Manipulators with Revolute Joints	233
C. S. Borcea and I. Streinu	
Robust Design Synthesis of Spherical Parallel Manipulator for Dexterous Medical Task	241
A. Chaker, A. Mlika, M. A. Laribi, L. Romdhane and S. Zeghloul	
Self Dual Topology of Parallel Mechanisms with Configurable Platforms	249
P. Lambert and J. L. Herder	
Four-Dimensional Persistent Screw Systems of the General Type	257
M. Carricato	
Determination of Maximal Singularity-Free Workspace of Parallel Mechanisms Using Constructive Geometric Approach	265
M. H. F. Kaloorazi, M. T. Masouleh, S. Caro and B. M. Gholamali	
Kinematic Design of Two Elementary 3DOF Parallel Manipulators with Configurable Platforms	273
A. G. L. Hoevenaars, P. Lambert and J. L. Herder	
Single Exponential Motion and its Kinematic Generators	281
G. Liu, Y. Wu and X. Chen	

Foundations for the Approximate Synthesis of RCCC Motion Generators	289
J. Angeles	
The 3-RPS Manipulator Can Have Non-Singular Assembly-Mode Changes	297
M. Husty, J. Schadlbauer, S. Caro and P. Wenger	
Exact Workspace Synthesis for RCCR Linkages	305
B. Batbold, Y. Yihun, J. S. Wolper and A. Perez-Gracia	
A Closed-Form Solution of Spatial Sliders for Rigid-Body Guidance	313
C. Huang, W. C. Huang and G. Kiper	
A Cartesian Cable-Suspended Robot for Aiding Mobility	321
G. Castelli and E. Ottaviano	
Evaluating the Spatial Compliance of Circularly Curved-Beam Flexures	329
F. P. Rad, G. Berselli, R. Vertechy and V. Parenti Castelli	
Kinematic Analysis of Slider-Crank Derived from the λ-Mechanism	337
E. Ottaviano, P. Rea and M. Conte	
Improved Muscle Wrapping Algorithms Using Explicit Path-Error Jacobians	345
A. Scholz, I. Stavness, M. Sherman, S. Delp and A. Kecskeméthy	
Author Index	353
Subject Index	356