
Contents

Chapter I: Novel Mechanisms	
Summary of Chapter I	3
Feasibility Study of Robust Neural Network Motion Tracking Control of Piezoelectric Actuation Systems for Micro/Nano Manipulation <i>Hwee Choo Liaw, Bijan Shirinzadeh, Gursel Alici, Julian Smith</i>	5
Hybrid Formation Control for Non-Holonomic Wheeled Mobile Robots <i>Juan Marcos Toibero, Flavio Roberti, Paolo Fiorini, Ricardo Carelli</i>	21
Novel Tripedal Mobile Robot and Considerations for Gait Planning Strategies Based on Kinematics <i>Ivette Morazzani, Dennis Hong, Derek Lahr, Ping Ren</i>	35
Safe Joint Mechanism Based on Passive Compliance for Collision Safety <i>Jung-Jun Park, Jae-Bok Song, Hong-Seok Kim</i>	49
A Guidance Control Strategy for Semi-autonomous Colonoscopy Using a Continuum Robot <i>Gang Chen, Minh Tu Pham, Tanneguy Redarce</i>	63
Fully-Isotropic T1R3-Type Redundantly-Actuated Parallel Manipulators <i>Grigore Gogu</i>	79

Early Reactive Grasping with Second Order 3D Feature Relations
Daniel Aarno, Johan Sommerfeld, Danica Kragic, Nicolas Pugeault, Sinan Kalkan, Florentin Wörgötter, Dirk Kraft, Norbert Krüger 91

Chapter II: Perception Guided Navigation and Manipulation

Summary of Chapter II..... 109

Part 1: Perception Guided Navigation

Link Graph and Feature Chain Based Robust Online SLAM for Fully Autonomous Mobile Robot Navigation System Using Sonar Sensors
Amit Kumar Pandey, K. Madhava Krishna 113

Services Robots Navigating on Smart Floors
Erwin Prassler, Thomas Kämpke, Boris Kluge, Matthias Strobel 133

Control of Many Agents by Moving Their Targets: Maintaining Separation
Timothy Bretl 145

Improved Mapping and Image Segmentation by Using Semantic Information to Link Aerial Images and Ground-Level Information
Martin Persson, Tom Duckett, Achim Lilienthal 157

Active Visual Search by a Humanoid Robot
Francois Saidi, Olivier Stasse, Kazuhito Yokoi 171

Visual Control of a Micro Helicopter under Dynamic Occlusions
Yuta Yoshihata, Kei Watanabe, Yasushi Iwatani, Koichi Hashimoto 185

Part 2: Perception Guided Manipulation

Visual Servoing from Spheres with Paracatadioptric Cameras
Romeo Tatsambon Fomena, François Chaumette 199

Dynamic Targets Detection for Robotic Applications Using Panoramic Vision System
Abedallatif Baba, Raja Chatila 215

Vision-Based Control of the RoboTenis System

*L. Angel, A. Traslosheros, J.M. Sebastian, L. Pari, R. Carelli,
F. Roberti* 229

Particle Filter Based Robust Recognition and Pose Estimation of 3D Objects in a Sequence of Images

Jeihun Lee, Seung-Min Baek, Changhyun Choi, Sukhan Lee 241

Preliminary Development of a Line Feature-Based Object Recognition System for Textureless Indoor Objects

Gunhee Kim, Martial Hebert, Sung-Kee Park 255

Modelling of Second Order Polynomial Surface Contacts for Programming by Human Demonstration

Peter Slaets, Wim Meeussen, Herman Bruyninckx, Joris De Schutter 269

Robot Self-modeling of Rotational Symmetric 3D Objects Based on Generic Description of Object Categories

Joon-Young Park, Kyeong-Keun Baek, Yeon-Chool Park, Sukhan Lee 283

Chapter III: Human-Robot Interaction and Intelligence

Summary of Chapter III 301

Part 1: Human-Robot Interaction**Dynamic Speech Interaction for Robotic Agents**

Jan Koch, Holger Jung, Jens Wettach, Geza Nemeth, Karsten Berns 303

Hand Posture Recognition Using Adaboost with SIFT for Human Robot Interaction

Chieh-Chih Wang, Ko-Chih Wang 317

Multimodal Navigation with a Vibrotactile Display in Computer Assisted Surgery

Melina Brell, Andreas Hein 331

Two Arms Are Better Than One: A Behavior Based Control System for Assistive Bimanual Manipulation

Aaron Edsinger, Charles C. Kemp 345

Part 2: Intelligence**A Customizable, Multi-host Simulation and Visualization Framework for Robot Applications**

Tim Braun, Jens Wettach, Karsten Berns 357

Imitation of Walking Paths with a Low-Cost Humanoid Robot
Jacopo Aleotti, Stefano Caselli..... 371

Intelligent Robot Software Architecture
Jonghoon Kim, Mun-Taek Choi, Munsang Kim, Suntae Kim, Minseong Kim, Sooyong Park, Jaeho Lee, ByungKook Kim..... 385

Ontology-Based Semantic Context Modeling for Object Recognition of Intelligent Mobile Robots
Jung Hwa Choi, Young Tack Park, Il Hong Suh, Gi Hyun Lim, Sanghoon Lee..... 399

Author Index..... 409