Technical Sessions, September 5, 2007

Plenary Talk

Date: Wednesday, September 5, 2007
Time: 09.10 – 09.50
Room: Audi Max, HG F30

Prof. Hiroshi Ishiguro
Osaka University
Studies on Humanoids and Androids

Modular Robots

Date: Wednesday, September 5, 2007
Time: 10.00 – 11.00
Room: CHN E42
Session Chair: *Jake Abbott*

179 The Magnetic Self-Aligning Hermaphroditic Connector - A Scalable Approach for Modular Microrobots
Zoltan Nagy, Jake Abbott, Bradley Nelson

266 The Dof-Box Project: An Educational Kit for Configurable Robots
Davis Daidié, Olivier Barbey, Florent Guenter, Aude Billard

187 A Novel Modular Climbing Caterpillar Using Low-frequency Vibrating Passive Suckers
Houxiang Zhang, J. González-Gómez, S. Chen, W. Wang, R. Liu, J. Zhang

SMA Actuators

Date: Wednesday, September 5, 2007
Time: 10.00 – 11.00
Room: CHN E46
Session Chair: *Robert Gorbert*

296 Hybrid Monolithic SMA Actuators
Ryan Walker, Robert Gorbet, Leslie Toews, Mark Whitney, Steve Corbin

299 Inverse Model-Based Control and Disturbance Rejection for a Shape Memory Alloy Actuator
Arati Pai, Robert Gorbet

99 Control Approach for a Novel High Power-To-Weight Ratio Actuator Scalable in Force and Length for Robots
Robert Kratz, Maximilian Stelzer, Martin Friedmann, Oskar von Stryk

Diagnosis & Failure Management

Date: Wednesday, September 5, 2007
Time: 10.00 – 11.00
Room: CHN F42
Session Chair: *Antoine Ferreira*

121 Fault Detection for Nonlinear Systems in Presence of Input Unmodeled Dynamics
Shreekant Gayaka, Bin Yao, Peter Meckl

73 Sensor Fault Detection and Isolation for a Powered Wheelchair
Masafumi Hashimoto, Kazuhiko Takahashi

190 Intelligent Model-Free Diagnosis for Multiple Faults in a Nonlinear Dynamic System
Paul Lin, Hardeep Singh

Manipulators

Date: Wednesday, September 5, 2007
Time: 10.00 – 11.00
Room: CHN F46
Session Chair: *Hitoshi Kino*

41 The Development of 6 D.O.F Robot Manipulator with Human-Friendly Design
Jeong-Min Lee, Bum-Seok Park, Yong-Seok Lee, Jeong-Seok Ahn, Sang-Ho Lee, Seong-Jin Lim, Chang-Soo Han

124 Optimal Design for Energy Conservation of a Vertically Articulated Manipulator
Izumi Teruyuki, Adachi Miku, Zhou Hai

89 Evaluation of Workspace of A Spherical Robotic Wrist
Shaoping Bai, Michael R. Hansen

Machine Vision I

Date: Wednesday, September 5, 2007
Time: 11.20 – 12.20
Room: CHN E42
Session Chair: *George Chiu*

152 Real-time Applicable Visual Quality Control in Industrial Line Production
Alexander Barth, Rainer Herpers, Markus Greßnich

194 3D Measurement Technique for Convex Shape Acquisition
András Rövid, Takeshi Hashimoto

Human-Machine Interaction I

Date: Wednesday, September 5, 2007
Time: 11.20 – 12.20
Room: CHN E46
Session Chair: *Massimiliano Zecca*

195 Position-Detecting Device for Measurement of Human Motion in Human-Machine Interaction
Toru Tsumugiwa, Atsushi Kamiyoshi, Ryuichi Yokogawa, Hiroshi Shibata

170 Analysis and Evaluation of Hand Motion in Use of Tools
Yu Kinoshita, Akinori Sasaki, Hashimoto Hiroshi, Chiharu Ishii

144 Measurement of Human Lower Limb Orientations and Ground Reaction Forces Using Wearable Sensor System
Tao Liu, Yoshio Inoue, Kyoko Shibata, Rencheng Zheng

Sensing I

Date: Wednesday, September 5, 2007
Time: 11.20 – 12.20
Room: CHN F42
Session Chair: *Ren C. Luo*

61 Nonlinear modeling and estimation of force in a piezoelectric cantilever
Philippe Lutz, Yassine Haddab, Philippe Lutz

133 A Novel 3-DOF Sensing Methodology For Spherical Actuator
Chee Kian Lim, Chen I-Ming

316 3-D Shape measurement using constant gap control
Kyihwan Park, Kyosoon Choi, Woosub Yeom, Sangyou Kim, Heesun Yoon

Flexible Manipulators I

Date: Wednesday, September 5, 2007
Time: 11.20 – 12.20
Room: CHN F46
Session Chair: *T. J. Tarn*

216 Impact Manipulation by a Hyper-flexible Robotic Manipulator
Hiromi Mochiyama, Hideo Fujimoto

168 Deformation Analysis of Belt-Formed Pulley to Adjust Joint Stiffness of Tendon Robot
Dai Nakiri, Tuyoshi Nakakura, Hitosh Kino

106 Redundant muscle coordination of a multi-DOF robot joint by online optimization
Masakazu Suzuki, Takashi Mayahara, Akio Ishizaka

Machine Vision II

Date: Wednesday, September 5, 2007
Time: 13.40 – 15.00
Room: CHN E42
Session Chair: *Luca Bascetta*

260 Visual Servoing using a Parallel Robot: Preliminary Results
L. Ángel, Jose Maria Sebastián, A. Traslosheros, F. Roberti, R. Carelli

308 Determine Perceptual Laser Modulation Threshold for Extrinsic Signature Embedding in Electrophotographic Halftoned Images
Pei-Ju Chiang, Edward Delp, Jan Allebach, George Chiu

272 Navigation paradigm of a prehensive robotics assistance
Allart Benjamin, Marhic Bruno, Delahoche Laurent, Rémy-Néris Olivier

Design and Prototyping

Date: Wednesday, September 5, 2007
Time: 13.40 – 15.00
Room: CHN E46
Session Chair: *Jonathan Holmes*

215 Design Activities in the Development Process of Mechatronic Systems
Peter Hehenberger, Klaus Zeman

304 Design templates for mobile robot conceptual design
Raivo Sell, Mart Tamre

232 Redesign of the MMOC microgripper piezoactuator using a new topological optimization method
Mathieu Grossard, Christine Rotinat-Libersa, Nicolas Chaillet

55 Design of mechatronic systems with configuration-dependent dynamics: simulation and optimization
Maira da Silva, Wim Desmet, Hendrik Van Brussel

Teleoperation

Date: Wednesday, September 5, 2007
Time: 13.40 – 15.00
Room: CHN F42
Session Chair: *Hanafiah Yussof*

219 Handling of an Object in 3-D Space by Multiple Mobile Manipulators Based on Intentional Force/Moment Applied by Human
Yasuhisa Hirata, Yasuhiro Matsuda, Kosuge Kazuhiro

251 Dynamic Window based Force Reflection for Safe Teleoperation of A Mobile Robot via Internet
Josip Babic, Marko Budisic, Ivan Petrovic

125 A Posture Control of Redundant Manipulator using Image Information on Bilateral System
Tomoaki Ohta, Murakami Toshiyuki

295 A Haptic Tele-Manipulation Environment for a Vibration-Driven Micromechatronic Device
Kostas Vlachos, Panagiotis Vartholomeos, Evangelos Papadopoulos

Dual Arm / Cooperative

Date: Wednesday, September 5, 2007
Time: 13.40 – 15.00
Room: CHN F46
Session Chair: *Panagiotis Artemiadis*

53 An Experimental Investigation on Impedance Control for Dual-Arm Cooperative Systems
Fabrizio Caccavale, Pasquale Chiacchio, Agostino De Santis, Alessandro Marino, Luigi Villani

245 Manipulation by Juggling of Planar Polygonal Objects Using Two 3-DOF Manipulators
Adel Akbarimajd, Majid Nili Ahmadabadi

16 Genetic Algorithm Based Optimization for Dual-Arm Cam-Lock Robot Configuration
Kambiz Ghaemi Osgouie, Ali Meghdari, Saeed Sohrabpour, Mehdi Salmani Jelodar

306 Reactive Hand-Arm Coordination for a Humanoid Robot using Extended Petri-Nets
Dirk Osswald, Nicolas Gorges, Heinz Wörn

Electromagnetic Devices I

Date: Wednesday, September 5, 2007
Time: 15.20 – 16.40
Room: CHN E42
Session Chair: *Bin Yao*

88 Development of a pulsed electromagnetic micro-actuator for 3D tactile displays
Kai Deng, Eniko Enikov, Hongwei Zhang

307 Using a Series of Moving Coils as a High Redundancy Actuator
Thomas Steffen, Jessica Davies, Roger Dixon, Roger Goodall, Argyrios Zolotas

193 Parameters Identification of the Dynamics Model of a Stepping Motor with Permanent Magnet
Aljaz Kapun, Aleš Hace, Karel Jezernik

320 Equivalent Voice-coil Models for Real-time Computation in Electromagnetic Actuation and Sensor Applications
Kok-Meng Lee, Hungsun Son

Actuators

Date: Wednesday, September 5, 2007
Time: 15.20 – 16.40
Room: CHN E46
Session Chair: *Takefumi Kanda*

200 Modelling and control of a smart auxiliary mass damper equipped with a Bragg grating
Chris May, Aldo Minardo, Ciro Natale, Pietro Pagliarulo, Salvatore Pirozzi

172 Force ripple compensation in linear motors with application to a parallel kinematic machine
Luca Bascetta, Gianantonio Magnani, Paolo Rocco

151 Design Criteria for Stable Friction Drive Operation of Surface Acoustic Wave Motor
Takashi Shigematsu, Minoru Kurosawa

65 Soft Pressure Sensor Embedded in McKibben Actuator
Shuichi Wakimoto, Koichi Suzumori, Takefumi Kanda, Kenji Kure

Rehabilitation Robotics

Date: Wednesday, September 5, 2007
Time: 15.20 – 16.40
Room: CHN F42
Session Chair: *Max Meng*

135 Power-Assist Control of an Electric Wheelchair Considering Step Passage
Sakiko Tashiro, Murakami Toshiyuki

68 MEDARM: a rehabilitation robot with 5DOF at the shoulder complex
Stephen Ball, Ian Brown, Stephen Scott

72 Impedance Control of CPM Device with Flex-/Extension and Pro-/Supination of Upper Limbs
Matsunaga Nobutomo, Shota Miyaguchi, Kousei Nojiri, Shigeyasu Kawaji

34 EMG-based Position and Force Control of a Robot Arm: Application to Teleoperation and Orthosis
Panagiotis Artemiadis, Kostas Kyriakopoulos

Parallel Manipulators I

Date: Wednesday, September 5, 2007
Time: 15.20 – 16.40
Room: CHN F46
Session Chair: *Gursel Alici*

32 Forward Kinematics of A Macro--Micro Parallel Manipulator
Hamid Taghirad, Meyer Nahon

33 Jacobian Analysis of A Macro--Micro Parallel Manipulator
Hamid Taghirad, Meyer Nahon

24 Workspace Optimisation of a Reconfigurable Parallel Kinematic Manipulator
Ilya Tyapin, Geir Hovland, Torgny Brogardh

Electromagnetic Devices II

Date: Wednesday, September 5, 2007
Time: 16.50 – 18.10
Room: CHN E42
Session Chair: *Gerhard Schweitzer*

58 Distributed Multi-Pole Model for Motion Simulation of PM-based Spherical Motors
Hungsun Son, Kok-Meng Lee

220 Modeling Magnetic Torque and Force for Controlled Manipulation of Soft-Magnetic Bodies
Jake Abbott, Olgac Ergeneman, Michael Kummer, Ann Hirt, Bradley Nelson

207 A Single Deck 2D Magnet Levitation Platform
Jia-Yush Yen, Ye-Ling Lee, Yi-Chih Lai

Haptic Interaction

Date: Wednesday, September 5, 2007
Time: 16.50 – 18.10
Room: CHN E46
Session Chair: *Chen I-Ming*

28 Haptic Manipulation of Virtual Linkages with Closed Loops
Menno Beenakkers, Daniela Constantinescu, Maarten Steinbuch

324 A Novel Haptic Interface for Musical Keyboards
José Lozada, Moustapha Hafez, Xavier Boutillon

314 A Virtual Arm Wrestling System for the Analysis by Synthesis of Force Display Communication
Takashi Yamada, Tomio Watanabe

38 Development of a Handshake Robot System Based on a Handshake Approaching Motion Model
Mitsuru Jindai, Tomio Watanabe

Sensing II

Date: Wednesday, September 5, 2007
Time: 16.50 – 18.10
Room: CHN F42
Session Chair: *Hashimoto Hideki*

76 An Investigation into Behaviour of Electroactive Polymers as Mechanical Sensors
Gursel Alici, Geoffrey Spinks, John Madden, Yanzhe Wu, Gordon Wallace

92 Velocity estimation: assessing the performance of non model-based techniques
Luca Bascetta, Gianantonio Magnani, Paolo Rocco

166 Mass Estimation in microgravity with a Variable Stiffness Mechanism
Ryota Ishibashi, Ryuta Ozawa, Sadao Kawamura

148 Acting in Intelligent Space - Mobile robot control based on sensors distributed in space
Drazen Brscic, Takeshi Sasaki, Hashimoto Hideki

Parallel Manipulators II

Date: Wednesday, September 5, 2007
Time: 16.50 – 18.10
Room: CHN F46
Session Chair: *Hamid Taghirad*

23 Experimental Verification of Friction and Dynamic Models of a Parallel Kinematic Machine
Geir Hovland, Matthew Murray, Torgny Brogardh

221 Self-Calibration of the 6-dof Parallel Robot TriPlanar by Identification of the Geometry Parameters
Hüseyin Cinkaya, Eckehard Münch, Rene Nölle, Ansgar Trächtler

110 Aspects of reconfigurability of a special class of parallel robots
Cornel Brisan

50 A New Force Calculation Algorithm for Tendon-Based Parallel Manipulators
Tobias Bruckmann, Lars Mikelsons, Manfred Hiller, Dieter Schramm

Technical Sessions, September 6, 2007

Plenary Talk

Date: Thursday, September 6, 2007
Time: 08.30 – 09.10
Room: Audi Max, HG F30

Gernot Spiegelberg
Siemens VDO
Pioneering drive by wire technology

Microactuators

Date: Thursday, September 6, 2007
Time: 09.20 – 10.40
Room: CHN E42
Session Chair: *Minoru Kurosawa*

46 Locomotion of a Miniature Robot Based on Synchronized Vibrating Actuation Mechanisms
Anh Tuan Nguyen, Sylvain Martel

204 An In-wheel Type Micro Ultrasonic Motor utilizing Sector Shaped Piezoelectric Vibrators
Takefumi Kanda, Yusuke Matsunaga, Koichi Suzumori

43 Preliminary Design of an Autonomous Microrobot Propelled by Magnetotactic Bacteria
Andre Walder, Sylvain Martel

293 Driving Principles and Hardware Integration of Microrobots Employing Vibration Micromotors
Panagiotis Vartholomeos, Kostas Mougiakos, Evangelos Papadopoulos

Nonlinear and Adaptive Control I

Date: Thursday, September 6, 2007
Time: 09.20 – 10.40
Room: CHN E46
Session Chair: *Masayoshi Tomizuka*

20 Deaign and Experimental Evaluation of a Data-Driven Skill-Based Controller
Shinnosuke Mori, Akihiro Sakaguchi, Toru Yamamoto

140 Robot Task Switching in Complex Environments
Genci Capi

196 A Bayesian Approach to Conceptualization Using Reinforcement Learning
Saeed Amizadeh, Majid Nili Ahmadabadi, Babak Nadjar Araabi, Roland Siegwart

Transportation Systems I

Date: Thursday, September 6, 2007
Time: 09.20 – 10.40
Room: CHN F42
Session Chair: *Yoshiharu Amano*

104 Development of Positioning Technique using Omni-directional IR Camera and Aerial Survey Data
Jun-ichi Meguro, Taishi Murata, Hidetoshi Nishimura, Amano Yoshiharu, Takumi Hashizume, Takiguchi Jyun-ichi

105 Vehicle Stability Control of Electric Vehicle with Slip-ratio and Cornering Stiffness Estimation
Hiroshi Fujimoto

145 Design of Steer-by-Wire System with Bilateral Control Method Using Disturbance Observer
JaeSung Im, Funminori Ozaki, Matsunaga Nobutomo, Shigeyasu Kawaji

205 A modal control for active/semi-active suspension systems
Francesco Braghin, Ferruccio Resta

Robot Locomotion I

Date: Thursday, September 6, 2007
Time: 09.20 – 10.40
Room: CHN F46
Session Chair: *Toshio Fukuda*

134 Passive Crawling of a soft robot
Hisashi Nakanishi, Hirai Shinichi

161 Adapted Magnetic Wheel Unit for Compact Robots Inspecting Complex Shaped Pipe Structures
Fabien Tache, Wolfgang Fischer, Roland Siegwart, Roland Moser, Francesco Mondada

188 How Self-locking Reduces Actuators Torque In Climbing Snake Robots
Farshad Barazandeh, Behnam Bahr, Amir Moradi

265 Basic Movements of a Nonholonomic Wheel-Based Pole Climbing Robot
Sara Mahdavi, Ehsan Noohi, Majid Nili Ahmadabadi

Micro/Nano Devices

Date: Thursday, September 6, 2007
Time: 11.00 – 12.20
Room: CHN E42
Session Chair: *Ning Xi*

18 Micro Flywheel Energy Storage System with Axial Flux Machine
Ji-eun Yi, Kang Lee, Bongsu Kim, Junseok Ko, Sangkwon Jeong, Myounggyu Noh, Seung Lee

175 Advanced Free-Surface Microstereolithography with 10micrometers Resolution for Hybrid Microstructure
Kengo Kobayashi, Koji Ikuta

128 Position and Vibration Control of an XYZ Flexure Parallel Mechanism
Xueyan Tang, Chen I-Ming

Nonlinear and Adaptive Control II

Date: Thursday, September 6, 2007
Time: 11.00 – 12.20
Room: CHN E46
Session Chair: *Job van Amerongen*

153 Improving the vibration isolation performance of hard mounts for precision equipment
Tjeerd van der Poel, Johannes van Dijk, Ben Jonker, Herman Soemers

19 Adaptive Robust Controller Design For Dual-Stage Hard Disk Drives
Hamid Taghirad, Peyman Sheykholeslami

189 A grey-box identification of an LPV vehicle model with side slip angle estimation
Peter Gaspar, Zoltan Szabo, Jozsef Bokor

244 Adaptive Robust Precision Motion Control of A High-Speed Linear Motor with Cogging Force Compensations
Bin Yao, Chuxiong Hu, Qingfeng Wang

Transportation Systems II

Date: Thursday, September 6, 2007
Time: 11.00 – 12.20
Room: CHN F42
Session Chair: *Hiroshi Fujimoto*

208 Observer Based Semi-Active Suspension Control Applied to a Light Commercial Vehicle
Sankaranarayanan Velupillai, Engin Emekli, Bilin Aksun Guvenc, Levent Guvenc, Serdar Ozturk, Server Ersolmaz, Erhan Eyol, Mustafa Sinal

280 Optimal Power Management of Plug-in HEV with Intelligent Transportation System
Qiuming Gong, Yaoyu Li, Zhong-Ren Peng

137 Control of a Full Scale Locomotive Roller Rig for the Simulation of Wheel Sliding
Monica Malvezzi, Benedetto Allotta, Luca Pugi, Andrea Rindi

246 A feasibility study of an aerodynamic control for a high speed pantograph
Andrea Collina, Alan Facchinetti, Ferruccio Resta

Robot Locomotion II

Date: Thursday, September 6, 2007
Time: 11.00 – 12.20
Room: CHN F46
Session Chair: *Marcelo Ang Jr*

164 Importance of sensors' feedback in legged rovers controlled by evolutionary dynamical neural network
Luca Vailati, Guido Sangiovanni, Franco Bernelli Zazzera

240 Embodied and Evolved Dynamical Neural Networks for Robust Planetary Navigation
Guido Sangiovanni, Massimo Cortesi, Franco Bernelli Zazzera

54 Experimental Studies and Parametric Modeling of Ionic Flyers
Chor Fung Chung, Wen Jung Li

123 A Novel Robotic Spacecraft Simulator with Mini-Control Moment Gyroscopes and Rotating Thrusters
Jason Hall, Marcello Romano

Micro/Nano Manipulation

Date: Thursday, September 6, 2007
Time: 13.40 – 15.00
Room: CHN E42
Session Chair: *Sylvain Martel*

117 Autonomous 2D Microparticle Manipulation based on Visual Feedback
Cagdas Onal, Metin Sitti

51 Electrostatic forces and micromanipulator design: on the importance of surface topography parameters
Marion Sausse Lhernould, Alain Delchambre, Pierre Lambert, Stéphane Régnier

279 Modeling Dielectrophoretic Force for Manipulating Carbon Nanotubes (CNTs)
Uchechukwu Wejinya, Yantao Shen, Ning Xi, King Lai

281 On-line Sensing and Display in Atomic Force Microscope Based Nanorobotic Manipulation
Liu Lianqing, Jiangbo Zhang, Guangyong Li, Ning Xi

Nonlinear and Adaptive Control III

Date: Thursday, September 6, 2007
Time: 13.40 – 15.00
Room: CHN E46
Session Chair: *Majid Ahmadabadi*

209 Evolutionary Hardware-in-the-Loop Optimization of a Controller for Cascaded Hydraulic Valves
Johannes Krettek, Daniel Schauten, Frank Hoffmann, Torsten Bertram

227 Iterative Learning Explicit Hybrid Force/Velocity Control for Contour Tracking
Giacomo Ziliani, Antonio Visioli, Giovanni Legnani

149 Systolic Architecture Modeling with Architectural Petri Nets - Application to a Wheelchair Neural Control
Patrick Abellard, Alexandre Abellard, Philippe Gorce

85 Chaos control of a Sprott Circuit using Delayed Feedback Control: Experimental Study
Hassan Salarieh, Kave Merat, Hoda Sadeghian, Aria Alasty

Transportation Systems III

Date: Thursday, September 6, 2007
Time: 13.40 – 15.00
Room: CHN F42
Session Chair: *Shigeyasu Kawaji*

173 Semiactive control of a secondary train suspension
Sergio Savaresi, Fabio Codecà, Mauro Montiglio, Michele Ieluzzi

285 Mechatronic Vehicle Door Assistant
Jürgen Maas, Simon Kern

36 Laser Scanner-Based Navigation and Motion Planning for Truck-Trailer Combinations
Roland Stahn, Tobias Stark, Andreas Stopp

Robot Locomotion III

Date: Thursday, September 6, 2007
Time: 13.40 – 15.00
Room: CHN F46
Session Chair: *Zazzera Bernelli*

155 Control Strategy for a Snake-like robot based on Constraint Force and Its Validation
Kouki Watanabe, Masami Iwase, Shoshiro Hatakeyama, Takehiko Maruyama

322 Design Method of Brachitation Controller based on PDAC
Toshio Fukuda, Shigetaka Kojima, Kosuke Sekiyama, Yasuhisa Hasegawa

269 Comparison Between Two Actuation Schemes for Underactuated Brachiation Robots
Viníciu Oliveira, Walter Lages

11 Impact Forces and Mobility in Legged Robot Locomotion
Alan Bowling

Microassembly / Fabrication

Date: Thursday, September 6, 2007
Time: 15.20 – 16.40
Room: CHN E42
Session Chair: *Metin Sitti*

156 Design and Realization of a Miniature Spindle Test Setup with Active Magnetic Bearings
Maarten Kimman, Hans Langen, Jan van Eijk, Rob Munnig Schmidt

62 Dynamic modelling of a submerged freeze microgripper using a thermal network
Beatriz Lopez Walle, Michael Gauthier, Nicolas Chaillet

69 Self-Aligning Electrostatic Gripper for Assembly of Millimeter-Sized Parts
Edward White, Eniko Enikov

40 Feeding of Submillimeter-sized Microparts along a Saw-tooth Surface using only Horizontal Vibration
Atsushi Mitani, Toshiatsu Yoshimura, Hirai Shinichi

Nonlinear and Adaptive Control IV

Date: Thursday, September 6, 2007
Time: 15.20 – 16.40
Room: CHN E46
Session Chair: *Steven Liu*

70 Robustness Evaluation of Fuzzy-based NCTF Control of Point-to-point (PTP) Positioning Systems
Wahyudi Martono, Tarig F Ibrahim, Riza Muhida, Momoh J.E. Salami

116 Synthesis of Variable Structure System for the Complex Dynamic Object
Alexander Lebedev, Vladimir Filaretov

146 Positioning Controller for Mechanical Systems with a Mini Harmonic Drive Servo Actuator
Tegoeh Tjahjowidodo, Farid Al-Bender, Hendrik Van Brussel, Wim Symens

183 Adaptive Self-Sensing Control of Flexible Structures by Using a Piezoelectric Actuator
Hiroshi Okubo, Shun Otaki

Navigation and Planning I

Date: Thursday, September 6, 2007
Time: 15.20 – 16.40
Room: CHN F42
Session Chair: *Marcello Romano*

160 FM^2: a real-time Fast Marching sensor based Path Planner
Santiago Garrido, Luis Moreno, Dolores Blanco, Fernando Martin

59 Planning Algorithms for S-curve Trajectories
Kim Doang Nguyen, Chen I-Ming, Teck-Chew Ng

131 Optimal Area Covering using Genetic Algorithms
Paulo Jimenez, Bijan Shirinzadeh, Ann Nicholson, Gursel Alici

91 Accumulated effect parameter tuning method for geometrical path tracking of wheeled mobile robots
Rangsarit Vanijjirattikhan, Manas Talukdar, Mo-Yuen Chow

Robust/Optimal Control I

Date: Thursday, September 6, 2007
Time: 15.20 – 16.40
Room: CHN F46
Session Chair: *Clauco Gaurin*

112 C-Code Implementation of Robust μ-Synthesis-Controllers for Industry Applications
Peter Kytka, Rainer Nordmann

283 Robust Control for Ultrasonic Motor Operating within Harsh Environments
Jérôme Gouatarbes, Moussa Boukhnifer, Antoine Ferreira, Didier Aubry, Pierre Magnan

284 Shaping Indirect Field Oriented Control for Induction Motor with Luenberger observer
Moussa Boukhnifer, Antoine Ferreira

218 Scara Robot Controller Using Real Time Linux
Rafael Aroca, Dalton Tavares, Glauco Caurin

Sensor Networks / Fusion

Date: Thursday, September 6, 2007
Time: 16.50 – 18.10
Room: CHN E42
Session Chair: *Reza Moheimani*

249 Localization Based on Magnetic and RSS Data Fusion with Covariance Intersection for Mobile Sensor Network
Ren C. Luo, Wei-Lung Hsu, Ogst Chen, Shau-Ku Huang

235 Sensor Network localisation using distributed extended Kalman filter
Maurizio Di Rocco, Federica Pascucci

7 Data Centric Adaptive In-Network Aggregation for Wireless Sensor Networks
Hesiri Weerasinghe, Imad Elhajj, Aleksandra Krsteva, Mazen Abou Najm

95 Radio Efficiency Evaluation of a Body Sensor Platform
Hongliang Ren, Max Meng

Piezoelectric Devices

Date: Thursday, September 6, 2007
Time: 16.50 – 18.10
Room: CHN E46
Session Chair: *Kok-Meng Lee*

66 Characterization of a piezoworm stage
Shaun Salisbury, Ridha Ben Mrad, David Waechter, Eswar Prasad

67 Unconstrained Pneumatic On-Off Poppet Valve Driven by Piezoelectric Actuator
Hiroshi Takayama, Sumadi Jien, Hirai Shinichi

197 An Actuator Concept for a New Type of Piezoelectric Motor
Martin Schönecker, Peter Hagedorn

129 Modeling and Analysis on Ring-type Piezoelectric Transformer
Shine-Tzong Ho

Navigation and Planning II

Date: Thursday, September 6, 2007
Time: 16.50 – 18.10
Room: CHN F42
Session Chair: *Paolo Rocco*

31 Obstacle Negotiation for the Rescue Robot with Variable Single-Tracked Mechanism
Keun Ha Choi, Hae Kwan Jeong, Kyung Hak Hyun, Hyun Do Choi, Yoon Keun Kwak

177 Trajectory Navigation for Mobile Robot
Shunsuke Nara, Takahashi Satoru, Ishihara Hidenori

142 Design of Fuzzy Logic Based Mobile Robot Position Controller Using Genetic Algorithm
Bakir Lacevic, Jasmin Velagic

80 Study on Online Motion Planning Based on Basic Variables Set for Humanoid Robots
Wang Jian, Sheng Tao, Ma Hongxu

Robust/Optimal Control II

Date: Thursday, September 6, 2007
Time: 16.50 – 18.10
Room: CHN F46
Session Chair: *Roger Goodall*

297 Application of Optimal PWM of Induction Motor in Synchronous Machines at High Power Ratings
Arash Sayyah, Mitra Aflaki, Alireza Rezazade

309 LQG Control of a High Redundancy Actuator
Xinli Du, Roger Dixon, Roger Goodall, Argyrios Zolotas

171 Modeling and H∞ Loop-Shaping Control Design for Electric Power Steering System
Mahdi Moradkhani, Mohamad-Reza Haeiri-Yazdi, Farzad Rajaei Salmasi

44 Motion Tracking Control of Piezo-Driven Flexure-Based Mechanism based on Sliding Mode Strategy
Hwee Choo Liaw, Bijan Shirinzadeh, Julian Smith, Gursel Alici

Technical Sessions, September 7, 2007

Plenary Talk

Date: Friday, September 7, 2007
Time: 08.30 – 09.10
Room: Audi Max, HG F30

Rudolf Bannasch
EvoLogics GmbH
Morphological intelligence in nature and in bionic applications

Medical Devices and Systems

Date: Friday, September 7, 2007
Time: 09.20 – 10.40
Room: CHN E42
Session Chair: *Michael Gauthier*

305 "Surgery Recorder System" for Recording Position and Force of Forceps during Laparoscopic Surgery
Koji Ikuta, Takashi Kato, Hiroki Ooe, Satoshi Ando

291 Application of Ultrasonic Dental Scaler for Diagnosis
Yutaka Maruyama, Masaya Takasaki, Tomonori Kutami, Mizuno Takeshi

182 Magnetic Actuation and Guidance Mechanism for Active Capsule Endoscope
Xiaona Wang, Meng Max

268 Fabrication of Biodegradable Microdevices Toward Medical Application
Akira Yamada, Fuminori Niikura, Koji Ikuta

Robotic Hands / Finger

Date: Friday, September 7, 2007
Time: 09.20 – 10.40
Room: CHN E46
Session Chair: *Shigeki Sugano*

250 Ca.U.M.Ha. robotic hand (Cassino-Underactuated-Multifinger-Hand)
Giorgio Figliolini, Pierluigi Rea

14 Stable Manipulation Mechanisms on Soft Fingers
Takahiro Inoue, Hirai Shinichi

180 Novel Mechanism of Artificial Finger
Koichi Koganezawa, Yasutaka Ishizuka

Multi-Robot Systems

Date: Friday, September 7, 2007
Time: 09.20 – 10.40
Room: CHN F42
Session Chair: *Pekka Appelqvist*

139 Dynamic Role Assignment Algorithm for Robot Formation Control
Yu-Cheng Chen, Yin-Tien Wang

222 Cooperative Multi-Robot Localization using Differential Position Data
Kyounghwan Jo, Jihong Lee, JungBae Kim

158 The Entrapment/Escorting Mission for a Multi-Robot System: Theory and Experiments
Gianluca Antonelli, Filippo Arrichiello, Stefano Chiaverini

234 Learning Cooperative Object Pushing with Variable Contact Points
Abdol Hossein Aminaiee, Majid Nili Ahmadabadi

Mobile Robot Localization I

Date: Friday, September 7, 2007
Time: 09.20 – 10.40
Room: CHN F46
Session Chair: *Annalisa Milella*

257 Mobile robot self-localization in complex indoor environments using monocular vision and 3D model
Andreja Kitanov, Sanjin Bisevac, Ivan Petrovic

102 A Bio-inspired Robotic Sound Localization Method
Rong Liu, Meng Max

199 Monte Carlo Localization of mini-rovers with low-cost IR sensors
Fabrizio Abrate, Basilio Bona, Marina Indri

238 An Augmented State Vector Approach to GPS-Based Localization
Francesco Capezio, Antonio Sgorbissa, Renato Zaccaria

Flexible Manipulators II

Date: Friday, September 7, 2007
Time: 11.00 – 12.20
Room: CHN E42
Session Chair: *Makoto Iwasaki*

138 Development of a Soft Manipulator with Flexible Joints Using Smart Fluid and Pneumatics cushion for Collision with human
Yuki Akamatsu, Taro Nakamura, Yuta Kusaka

120 Precise Tip Positioning of a Flexible Manipulator using Resonant Control
Iskandar Mahmood, Reza Moheimani, Bharath Bhikkaji

226 A New Design Methodology for Passivity-Based Control of Single-Link Flexible Manipulators
Emiliano Pereira, Iván M. Diaz, Juan J. L. Cela, Vicente Feliu

267 Flexible Body Modeling and Vibration Damping for a Planar Parallel Robot using Input Shaping
Jens Kroneis, Steven Liu

Redundant Manipulators

Date: Friday, September 7, 2007
Time: 11.00 – 12.20
Room: CHN E46
Session Chair: *Bruno Siciliano*

143 Coil Function Control Problem for a Hyperredundant Robot
Mircea Ivanescu, Mihaela Cecilia Florescu

325 The skeleton algorithm for self-collision avoidance of a humanoid manipulator
Agostino De Santis, Alin Albu-Schäffer, Christian Ott, Bruno Siciliano, Gerd Hirzinger

35 Modeling, Full Identification and Control of the Mitsubishi PA-10 Robot Arm
Panagiotis Artemiadis, Nikolaos Bompos, Apollon ikonomopoulos, Kostas Kyriakopoulos

Helicopters

Date: Friday, September 7, 2007
Time: 11.00 – 12.20
Room: CHN F42
Session Chair: *Samir Bouabdallah*

45 Nonlinear model following control with parameter identification for a 3 DOF model helicopter
Mitsuaki Ishitobi, Masatoshi Nishi, Masaaki Miyachi

255 Prototype UAV helicopter working
Emanuele Frontoni, Adriano Mancini, Fabio Caponetti, Primo Zingaretti, Sauro Longhi

114 Nonlinear and Neural Network-Based Control of a Small Four-Rotor Aerial Robot
Holger Voos

178 Robust regulation of a helicopter model based on the highest derivative in feedback
Roman Czyba, M. Serafin

Mobile Robot Localization II

Date: Friday, September 7, 2007
Time: 11.00 – 12.20
Room: CHN F46
Session Chair: *Ivan Petrovic*

136 Machine Learning Approach to Self-Localization of Mobile Robots using RFID Tag
Yosuke Senta, Yoshihiko Kimuro, Syuhei Takarabe, Hasegawa Tsutomu

319 RFID-based Environment Mapping for Autonomous Mobile Robot Applications
Annalisa Milella, Paolo Vanadio, Grazia Cicirelli, Arcangelo Distante

224 Main-Lobe Canceling Method for Multiple Sound Sources Localization on Mobile Robot
Sasaki Yoko, Kagami Satoshi, Mizoguchi Hiroshi

210 A Study of Precise Road Feature Localization using Mobile Mapping System
Ishikawa Kiichiro, Amano Yoshiharu, Takumi Hashizume, Takiguchi Jyun-ichi

Precision Mechatronics

Date: Friday, September 7, 2007
Time: 13.40 – 15.00
Room: CHN E42
Session Chair: *Roland Moser*

6 Mechanical Slit Mask Mechanism Breadboard for the MOSFIRE instrument of the KECK Telescope Spectrometer
Emmanuel Onillon, P. Theurillat, A. O'Hare, P. Spanoudakis, P. Schwab

26 Command Shaping for Fast and Precise Positioning Considering Target Position Correction
Makoto Iwasaki, Masafumi Yamamoto, Nobuyuki Matsui

276 Segmented Iterative Learning Control for Precision Positioning of Waferstages
Sandipan Mishra, Masayoshi Tomizuka

47 Sensor Fusion for Improved Control of Piezoelectric Tube Scanners
Andrew Fleming, Adrian Wills, Reza Moheimani

Human-Machine Interaction II

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Room: CHN E46
Session Chair: *Agostino De Santis*

198 Recognizing Pointing Behavior using Image Processing for Human-Robot Interaction
Shoichiro Sakurai, Eri Sato, Yamaguchi Toru

286 On the development of the Bioinstrumentation System for the evaluation of human-robot interaction – Head and Hands Motion Capture Systems
Massimiliano Zecca, Nobutsuna Endo, Kazuko Itoh, Kazutaka Imanishi, Minoru Saito, Nobuhiro Nanba, Hideaki Takanobu, Atsuo Takanishi

157 Physiological parameters variation during driving simulations
Chiara Zocchi, Francesco Fanfulla, Alberto Rovetta

74 Emotion Interactive Robot Focus on Speaker Independently Emotion Recognition
Eun Ho Kim, Kyung Hak Hyun, Soo Hyun Kim, Yoon Keun Kwak

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Time: 13.40 – 15.00
Room: CHN F42
Session Chair: *Emanuele Frontoni*

57 Implementation of Control Algorithms in Field Programmable Gate Arrays
Maciej Petko, Grzegorz Karpiel

261 Characterization of data-sensitive wireless distributed networked-control-systems
Rachana Gupta, Avesh Kumar Agarwal, Mo-Yuen Chow, Wenye Wang

Mobile Robot Localization III

Date: Friday, September 7, 2007
Time: 13.40 – 15.00
Room: CHN F46
Session Chair: *Rudolph Triebel*

167 Appearance-based SLAM with Map Loop Closing Using Omnidirectional Camera
Mana Saedan, Chee Wang Lim, Marcelo Ang Jr

77 Effects of Iteration in Kalman Filters Family for Improvement of Estimation Accuracy in SLAM
Khoshnam Shojaie, Kaveh Ahmadi, Alireza M. Shahri

141 Laser Scan Matching for Measurement Update in a Particle Filter
Tahir Yaqub, Jayantha Katupitiya

256 Grounding Abstraction in Sensory Experience
Farzad Rastegar, Majid Nili Ahmadabadi

Bipedal Robots

Date: Friday, September 7, 2007
Time: 15.20 – 16.40
Room: CHN E42
Session Chair: *Alan Bowling*

165 Biped Walk Based on Vertical Pivot Motion of Linear Inverted Pendulum
Akinori Sekiguchi, Koki Kameta, Yuichi Tsumaki, Dragomir Nenchev

42 Online absorption of mediolateral balance disturbances for a small humanoid robot using accelerometer and force-sensor feedback
Alvaro Carmona, Luis Molina-Tanco, Mar Azuaga, Juan A. Rodriguez, Francisco Sandoval

323 Biped Locomotion Strategy in Humanoid Robot Navigation: A Case of Speed-Up Walk
Hanafiah Yussof, Masahiro Ohka, Mitsuhiro Yamano, Yasuo Nasu

Industrial Robotics

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Time: 15.20 – 16.40
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Session Chair: *Geir Hovland*

132 Design of a Fresh Meat Packing Robot for Working in Washdown Environment
Debao Zhou, Jonathan Holmes, Wiley Holcombe, Sean Thomas, Gary McMurray

282 Automation of the Bird Shoulder Joint Deboning
Debao Zhou, Jonathan Holmes, Wiley Holcombe, Gary McMurray

275 Automated Robotic Inspection of Large Generator Stators
Roland Moser, Bernhard Mark

191 Development of a Multifunctional Robot End-Effector System for Automated Manufacture of Textile Preforms
Mohannad Tarsha Kordi, Mathias Hüsing, Burkhard Corves

Human Supervisory Control

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Time: 15.20 – 16.40
Room: CHN F42
Session Chair: *Dizan Vasquez*

288 Evaluation and Integration of a Wireless Touchscreen Into a Bridge Crane Control System
Jurg Suter, Dooroo Kim, William Singhose, Khalid Sorensen, Urs Glauser

258 Development of an Unmanned Ground Vehicle for Task-Oriented Operation - Considerations on Teleoperation and Delay
Pekka Appelqvist, Jere Knuuttila, Juhana Ahtiainen

79 Off-line Robot Palletizing Simulator Using Optimized Pattern and Trajectory Generation Algorithm
SeungNam Yu, Seong-Jin Lim, MaingKyu Kang, ChangSoo Han, SungRak Kim

56 Shared Autonomy Architecture for Skill Execution Manipulator
Woo-Keun Yoon, Takashi Suehiro, Kosei Kitagaki, Hiromu Onda

Manipulators II

Date: Friday, September 7, 2007
Time: 15.20 – 16.40
Room: CHN F46
Session Chair: *Keith Buffinton*

229 MIMO Identification with Optimal Experiment Design for Rigid Robot Manipulators
Luca Capisani, Antonella Ferrara, Lorenza Magnani

109 Self-Calibration of a Biologically-Inspired Cable-Driven Robotic Arm
Shabbir Kurbanhusen Mustafa, Yang Guilin, Song Huat Yeo, Lin Wei, Chen I-Ming

27 Software Abstractions for Modeling Robot Mechanisms
Davide Brugali