## TuA01

**Estimation and Control for UAVs (Regular Session)**

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<td>08:30-08:45</td>
<td>TuA01.1</td>
<td>State Estimation for Aggressive Flight in GPS-Denied Environments Using Onboard Sensing</td>
<td>Bry, Adam; Bachrach, Abraham; Roy, Nicholas</td>
<td>Massachusetts Inst. of Tech.</td>
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<td>08:45-09:00</td>
<td>TuA01.2</td>
<td>Autonomous Indoor 3D Exploration with a Micro-Aerial Vehicle</td>
<td>Shen, Shaojie; Michael, Nathan; Kumar, Vijay</td>
<td>Univ. of Pennsylvania</td>
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<tr>
<td>09:00-09:15</td>
<td>TuA01.3</td>
<td>Wind Field Estimation for Autonomous Dynamic Soaring</td>
<td>Langelaan, Jack W.; Spletzer, John; Montella, Corey; Grenestedt, Joachim</td>
<td>Penn State Univ; Lehigh Univ; Lehigh Univ</td>
</tr>
<tr>
<td>09:15-09:30</td>
<td>TuA01.4</td>
<td>Decentralized Formation Control with Variable Shapes for Aerial Robots</td>
<td>Turpin, Matthew; Michael, Nathan; Kumar, Vijay</td>
<td>Univ. of Pennsylvania</td>
</tr>
<tr>
<td>09:30-09:45</td>
<td>TuA01.5</td>
<td>Versatile Distributed Pose Estimation and Sensor Self-Calibration for an Autonomous MAV</td>
<td>Weiss, Stephan; Achtelik, Markus W.; Chli, Margarita; Siegwart, Roland</td>
<td>ETH Zurich; ETH Zurich, Autonomous Systems Lab</td>
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## TuA02

**Bipedal Robot Control (Regular Session)**

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<td>08:30-08:45</td>
<td>TuA02.1</td>
<td>Switching Control Design for Accommodating Large Step-Down Disturbances in Bipedal Robot Walking</td>
<td>Park, Hae Won; Sreenath, Koushil; Ramezani, Alireza; Grizzle, J.W</td>
<td>Univ. of Michigan</td>
</tr>
<tr>
<td>08:45-09:00</td>
<td>TuA02.2</td>
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</table>
Design and Experimental Implementation of a Compliant Hybrid Zero Dynamics Controller with Active Force Control for Running on MABEL, pp. 51-56. Attachment

Sreenath, Koushil
Park, Hae Won
Grizzle, J.W

Univ. of Michigan
Univ. of Michigan
Univ. of Michigan

09:00-09:15 TuA02.3

Walking Control Strategy for Biped Robots Based on Central Pattern Generator, pp. 57-62. Attachment

Liu, Chengju
Chen, Qijun

Tongji Univ.
Tongji Univ.

09:15-09:30 TuA02.4


Varkonyi, Peter L.
Gontier, David
Burdick, Joel

Budapest Univ. of Tech. and Ec.
Ec. Normale Superieure
California Inst. of Tech.

09:30-09:45 TuA02.5

Humanoid Robot Safe Fall Using Aldebaran NAO, pp. 71-78. Attachment

Yun, Seung-kook
Goswami, Ambarish

Honda Res. Inst.
Honda Res. Inst.

09:45-10:00 TuA02.6

Control Design to Achieve Dynamic Walking on a Bipedal Robot with Compliance, pp. 79-84. Attachment

Lim, Bokman
Lee, Minhyung
Kim, Joohyun
Lee, Jusuk
Park, Jae-ho
Seo, Keehong
Roh, Kyungshik

Samsung Advanced Inst. of Tech.
Samsung Advanced Inst. of Tech.
Samsung Advanced Inst. of Tech.
Samsung Advanced Inst. of Tech.
Samsung Electronics Co., Ltd
Samsung Advanced Inst. of Tech.
Samsung Electronics Co., Ltd

TuA03

Learning and Adaptive Control of Robotic Systems I (Regular Session)

Chair: Burke, Michael
Co-Chair: Sandini, Giulio

Council for Scientific and Industrial Res.
Italian Inst. of Tech.

08:30-08:45 TuA03.1


Hester, Todd
Quinlan, Michael
Stone, Peter

Univ. of Texas at Austin
Univ. of Texas at Austin
Univ. of Texas at Austin

08:45-09:00 TuA03.2

Sensorimotor Learning of Sound Localization from an Auditory Evoked Behavior, pp. 91-96.

Bernard, Mathieu
Pirim, Patrick
de Cheveigné, Alain
Gas, Bruno

Brain Vision Systems
BVS
Lab. Psychologie de la Perception (CNRS UMR 8158)
Univ. Pierre et Marie Curie

09:00-09:15 TuA03.3


Burke, Michael

Council for Scientific and Industrial Res.

09:15-09:30 TuA03.4

Direct Yaw Moment Control for Four Wheel Independent Steering and Drive Vehicles Based on Centripetal Force Detection, pp. 103-108.

Lam, Tin Lun
Xu, Yangsheng
Qian, Huihuan

The Chinese Univ. of Hong Kong / Shenzhen Inst. of Advan
Chinese Univ. of Hong Kong/ShenzhenInstituteofAdvanced Tech.
CUHK

09:30-09:45 TuA03.5
Courtial, Estelle
Fruchard, Matthieu
Alibert, Guillaume

09:45-10:00 TuA03.6
Korsah, G. Ayorkor
Kannan, Balajee
Browning, Brett
Stentz, Anthony
Dias, M. Bernardine

TuA04
Underactuated Robots (Regular Session)
Chair: Hollis, Ralph Carnegie Mellon Univ.
Co-Chair: Yim, Mark Carnegie Mellon Univ.

08:30-08:45 TuA04.1
Trajectory Generation for Underactuated Control of a Suspended Mass, pp. 123-129. Attachment
Schultz, Jarvis Northwestern Univ.
Murphey, Todd Northwestern Univ.

08:45-09:00 TuA04.2
Planning in High-Dimensional Shape Space for a Single-Wheeled Balancing Mobile Robot with Arms, pp. 130-135. Attachment
Nagarajan, Umashankar Carnegie Mellon Univ.
Kim, Byungjun Carnegie Mellon Univ.
Hollis, Ralph Carnegie Mellon Univ.

09:00-09:15 TuA04.3
Nagarajan, Umashankar Carnegie Mellon Univ.
Kantor, George Carnegie Mellon Univ.
Hollis, Ralph Carnegie Mellon Univ.

09:15-09:30 TuA04.4
Zhang, Chengkun Univ. of Delaware
Franch, Jaume Univ. Pol. de Catalunya
Agrawal, Sunil Univ. of Delaware

09:30-09:45 TuA04.5
Ortiz Morales, Daniel Umeå Univ.
La Hera, Pedro Umeå Univ.

09:45-10:00 TuA04.6
Biped Walking Stabilization Based on Gait Analysis, pp. 154-159. Attachment
Hashimoto, Kenji Waseda Univ.
Takezaki, Yuki Waseda Univ.
Motohashi, Hiromitsu Waseda Univ.
Otani, Takuya Waseda Univ.
Kishi, Tatsuhiro Waseda Univ.
Lim, Hun-ok Kanagawa Univ.
Takanishi, Atsuo Waseda Univ.

TuA05
Path Planning and Navigation (Regular Session)

Meeting Room 4 (Chief Wabasha)
Meeting Room 5 (Ska)
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<td>Lewis, Jeremy, O'Kane, Jason</td>
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<td>TuA05.2</td>
<td>Path Planning in Time Dependent Flow Fields Using Level Set Methods, pp. 166-173.</td>
<td>Lolla, Tapovan, Ueckermann, Matheus Percy, Yigit, Konuralp, Haley, Patrick, Lermusiaux, Pierre F.J.</td>
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<td>09:00-09:15</td>
<td>TuA05.3</td>
<td>Provably Safe Navigation for Mobile Robots with Limited Field-Of-Views in Unknown Dynamic Environments, pp. 174-179.</td>
<td>Bouraine, Sara, Fraichard, Thierry, Salhi, Hassen</td>
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<td>09:15-09:30</td>
<td>TuA05.4</td>
<td>An Efficient Mobile Robot Path Planning Using Hierarchical Roadmap Representation in Indoor Environment, pp. 180-186.</td>
<td>Park, Byungjae, Choi, Jinwoo, Chung, Wan Kyun</td>
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<td>TuA05.5</td>
<td>3D Time-Space Path Planning Algorithm in Dynamic Environment Utilizing Arrival Time Field and Heuristically Randomized Tree, pp. 187-192.</td>
<td>Ardiyanto, Igi, Miura, Jun</td>
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<td>09:45-10:00</td>
<td>TuA05.6</td>
<td>High-Speed Navigation of a Uniformly Braking Mobile Robot Using Position-Velocity Configuration Space, pp. 193-199.</td>
<td>Manor, Gil, Rimon, Elon</td>
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<td>Silver, David, Bagnell, James, Stentz, Anthony</td>
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<td>Rombokas, Eric, Theodorou, Evangelos, Malhotra, Mark, Todorov, Emanuel, Matsuoka, Yokky</td>
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<td>09:00-09:15</td>
<td>TuA06.3</td>
<td>Slip Prediction Using Hidden Markov Models: Multidimensional Sensor Data to Symbolic Temporal Pattern Learning, pp. 215-222.</td>
<td>Jamali, Nawid</td>
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Collision-Free State Estimation, pp. 223-228.
Wong, Lawson L.S. MIT
Kaelbling, Leslie MIT
Lozano-Perez, Tomas MIT

Fault Detection and Isolation from Uninterpreted Data in Robotic Sensorimotor Cascades, pp. 229-236.
Censi, Andrea California Inst. of Tech.
Hakansson, Magnus Lund Univ.
Murray, Richard California Inst. of Tech.

Describing and Classifying Spatial and Temporal Contexts with OWL DL in Ubiquitous Robotics, pp. 237-244.
Sgorbissa, Antonio Univ. of Genoa
Scalmato, Antonello Univ. of Genoa
Zaccaria, Renato Univ. of Genova

Robust and Adaptive Control of Robotic Systems (Regular Session)
Chair: Aswani, Anil Univ. of California at Berkeley
Co-Chair: Chung, Soon-jo Univ. of Illinois at Urbana-Champaign

A Nonlinear PI and Backstepping Based Controller for Tractor-Steerable Trailer Influenced by Slip, pp. 245-252.
Huynh, Van Queensland Univ. of Tech.
Smith, Ryan N. Queensland Univ. of Tech.
Kwok, Ngai Ming Univ. of New South Wales
Katupitiya, Jayantha The Univ. of New South Wales

Dual-Space Adaptive Control of Redundantly Actuated Parallel Manipulators for Extremely Fast Operations with Load Changes, pp. 253-258. Attachment
Sartori Natal, Guilherme LIRMM, Univ. of Montpellier 2
Chemori, Ahmed LIRMM
Pierrot, François CNRS - LIRMM

Learning Tracking Control with Forward Models, pp. 259-264. Attachment
Bocsi, Botond Babes Bolyai Univ.
Hennig, Philipp MPI Intelligent Systems
Csató, Lehel Babes Bolyai Univ.
Peters, Jan Tech. Univ. Darmstadt

Li, Xiang Nanyang Tech. Univ.
Cheah, C.C. Nanyang Tech. Univ.

Predictive Gaze Stabilization During Periodic Locomotion Based on Adaptive Frequency Oscillators, pp. 271-278. Attachment
Gay, Sébastien EPFL Ec. Pol. Fédérale de Lausanne
Santos-Victor, José Inst. Superior Técnico - Inst. for Systems and Robotics
Jipsiept, Auke EPFL

Learning-Based Model Predictive Control on a Quadrotor: Onboard Implementation and Experimental Results, pp. 279-284.
Bouffard, Patrick Michael Univ. of California, Berkeley
Aswani, Anil Univ. of California at Berkeley
Tomlin, Claire UC Berkeley
**TuA08**

**Redundant Robots (Regular Session)**

**Chair:** Rocco, Paolo  
**Co-Chair:** Kim, Hyunchul

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| 08:30-08:45   | Motion Control of Redundant Robots under Joint Constraints: Saturation in the Null Space, pp. 285-292. **Attachment** | Flacco, Fabrizio
De Luca, Alessandro
Khatib, Oussama |
| 08:45-09:00   | Priority Oriented Adaptive Control of Kinematically Redundant Manipulators, pp. 293-298. **Attachment** | Sadeghian, Hamid
Keshmiri, Mehdi
Villani, Luigi
Siciliano, Bruno |
| 09:00-09:15   | End-Link Dynamics of Redundant Robotic Limbs: The Reaction Null Space Approach, pp. 299-304. **Attachment** | Hara, Naoyuki
Handa, Yoichi
Nenchev, Dragomir |
| 09:15-09:30   | Resolving the Redundancy of a Seven DOF Wearable Robotic System Based on Kinematic and Dynamic Constraint, pp. 305-310. | Kim, Hyunchul
Li, Zhi
Milutinovic, Dejan
Rosen, Jacob |
| 09:30-09:45   | Dual-Arm Redundancy Resolution Based on Null-Space Dynamically-Scaled Posture Optimization, pp. 311-316. | Zanchettin, Andrea Maria
Rocco, Paolo |
| 09:45-10:00   | Optimal Decentralized Gait Transitions for Snake Robots, pp. 317-322. | Droge, Greg
Egerstedt, Magnus |

**TuA09**

**Collision (Regular Session)**

**Chair:** Kim, Young J.  
**Co-Chair:** Kroeger, Torsten

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| 08:30-08:45   | Time-Optimal Multi-Stage Motion Planning with Guaranteed Collision Avoidance Via an Open-Loop Game Formulation, pp. 323-329. | Takei, Ryo
Huang, Haomiao
Ding, Jerry
Tomlin, Claire |
| 08:45-09:00   | Execution and Analysis of High-Level Tasks with Dynamic Obstacle Anticipation, pp. 330-337. **Attachment** | Johnson, Benjamin
Haviak, Frank
Campbell, Mark |
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**A Depth Space Approach to Human-Robot Collision Avoidance**, pp. 338-345. *Attachment*

- Flacco, Fabrizio
- Kroeger, Torsten
- De Luca, Alessandro
- Khatib, Oussama

Univ. di Roma "La Sapienza"  
Stanford Univ.  
Stanford Univ.  
Stanford Univ.

09:15-09:30 TuA09.4

**LQG-Obstacles: Feedback Control with Collision Avoidance for Mobile Robots with Motion and Sensing Uncertainty**, pp. 346-353. *Attachment*

- van den Berg, Jur
- Wilkie, David
- Guy, Stephen J.
- Niethammer, Marc
- Manocha, Dinesh

Univ. of Utah  
Univ. of North Carolina  
Univ. of North Carolina at Chapel Hill  
UNC Chapel Hill  
UNC at Chapel Hill

09:30-09:45 TuA09.5


- Zhang, Xinyu
- Kim, Young J.

Ewha Womans Univ.  
Ewha Womans Univ.

09:45-10:00 TuA09.6

**Reciprocal Collision Avoidance for Multiple Car-Like Robots**, pp. 360-366. *Attachment*

- Alonso-Mora, Javier
- Breitenmoser, Andreas
- Beardsley, Paul
- Siegwart, Roland

ETH / Disney Res. Zurich  
ETH Zurich  
Disney Res. Zurich  
ETH Zurich

08:30-09:00 TuA110.1

**Curb Detection for a Pedestrian Robot in Urban Environments**, pp. 367-373. *Attachment*

- Maye, Jerome
- Kaestner, Ralf
- Siegwart, Roland

ETH Zurich  
ETH Zurich  
ETH Zurich

08:30-09:00 TuA110.2

**Towards a Watson That Sees: Language-Guided Action Recognition for Robots**, pp. 374-381. *Attachment*

- Teo, Ching Lik
- Yang, Yezhou
- Daume III, Hal
- Fermuller, Cornelia
- Aloimonos, Yiannis

Univ. of Maryland  
Univ. of Maryland  
Univ. of Maryland, Coll. Park  
Univ. of Maryland  
Univ. of Maryland

08:30-09:00 TuA110.3

**Tele-Impedance: Towards Transferring Human Impedance Regulation Skills to Robots**, pp. 382-388. *Attachment*

- Ajoudani, Arash
- Tsagarakis, Nikolaos
- Bicchi, Antonio

Istituto Italiano di Tecnologia  
Istituto Italiano di Tecnologia  
Univ. of Pisa

08:30-09:00 TuA110.4

**Visual Teach and Repeat Using Appearance-Based Lidar**, pp. 389-396.

- McManus, Colin
- Furgale, Paul Timothy
- Stenning, Braden
- Barfoot, Timothy

Univ. of Toronto  
Eidgenössische Tech. Hochschule Zürich  
Univ. of Toronto  
Univ. of Toronto
A Real-Time Micro-PIV System Using Frame-Straddling High-Speed Vision, pp. 397-402.

Kobatake, Motofumi
Takaki, Takeshi
Ishii, Idaku

Hiroshima Univ.

TuA110.5

Interactive Session TuA-2 (Interactive Session)

Chair: Bekey, George
Co-Chair: Lumia, Ron

Univ. of Southern California
Univ. of New Mexico

TuA210

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Oliveira, João Lobato
Ince, Gökhan
Nakamura, Keisuke
Nakadaï, Kazuhiko

LIACC-FEUP, INESC-Porto
Honda Res. Inst. Japan Co., Ltd.
Honda Res. Inst. Japan Co., Ltd.

TuA210.1

Teachless Teach-Repeat: Toward Vision-Based Programming of Industrial Robots, pp. 409-414.

Perrollaz, Mathias
Khorbotly, Sami
Cool, Amber
Yoder, John David
Baumgartner, Eric

INRIA Grenoble - Rhône-Alpes
Ohio Northern Univ.
Ohio Northern Univ.
Ohio Northern Univ.
Ohio Northern Univ.

TuA210.2

Lithium Hydride Powered PEM Fuel Cells for Long-Duration Small Mobile Robotic Missions, pp. 415-422.

Thangavelautham, Jekanathan
Strawser, Daniel
Cheung, Mei Yi
Dubowsky, Steven

Massachusetts Inst. of Tech.
Massachusetts Inst. of Tech.
Columbia Univ.

TuA210.3

Navigation in Three-Dimensional Cluttered Environments for Mobile Manipulation, pp. 423-429. Attachment

Hornung, Armin
Phillips, Mike
Jones, Edward Gil
Bennewitz, Maren
Likhachev, Maxim
Chitta, Sachin

Univ. of Freiburg
Carnegie Mellon Univ.
Willow Garage, Inc.
Univ. of Freiburg
Carnegie Mellon Univ.
Willow Garage Inc.

TuA210.4

Identification of Mechanical Parameters at Low Velocities for a Micropositioning Stage Using a Velocity Hysteresis Model, pp. 430-435.

Bogdan, Ioana Corina
Abba, Gabriel

Paul Verlaine Univ. of Metz
Arts et Métiers ParisTech

TuA210.5

Interactive Session TuA-3 (Interactive Session)

Chair: Bekey, George
Co-Chair: Lumia, Ron

Univ. of Southern California
Univ. of New Mexico

TuA310

Constellation - an Algorithm for Finding Robot Configurations That Satisfy Multiple Constraints, pp. 436-443.

Kaiser, Peter
Berenson, Dmitry
Vahrenkamp, Nikolaus
Asfour, Tamim

Karlsruhe Inst. of Tech.
Univ. of California, Berkeley
Karlsruhe Inst. of Tech. (KIT)
Karlsruhe Inst. of Tech. (KIT)

TuA310.1
TuA310.2

Modelling the Influence of Action on Spatial Attention in Visual Interactive Environments, pp. 444-450. Attachment

Borji, Ali
Univ. of Southern California (USC)

Itti, Laurent
Univ. of Southern California

Sihite, Dicky
Univ. of Southern California

TuA310.3

Online Identification of Quality of Teleoperator (QoT) for Performance Improvement of Telerobotic Operations, pp. 451-456.

Jia, Yunyi
Michigan State Univ.

Xi, Ning
Michigan State Univ.

Wang, Yunxia
MSU

Li, Xin
Michigan State Univ.

TuA310.4


Deshpande, Nikhil
North Carolina State Univ.

Grant, Edward
North Carolina State Univ.

Henderson, Thomas C.
Univ. of Utah

TuA310.5

Stress Analysis During Micro-Coil Deployment in Membranous Model of Saccular Aneurysm with Bleb, pp. 463-468.

Tercero Villagran, Carlos Rafael
Nagoya Univ.

Kojima, Masahiro
Nagoya Univ.

Ikeda, Seiichi
Nagoya Univ.

Ooe, Katsutoshi
Nagoya Univ.

Fukuda, Toshio
Nagoya Univ.

Arai, Fumihito
Nagoya Univ.

Negoro, Makoto
Fujita Health Univ.

Takahashi, Ikuko
Anjo Kosei Hospital

Kwon, Guiryong
Terumo Clinical Supply Ltd.

TuB01

Control and Planning for UAVs (Regular Session)

Chair: Mellinger, Daniel
Univ. of Pennsylvania

Co-Chair: Tedrake, Russ
Massachusetts Inst. of Tech.

TuB01.1

Deploying the Max-Sum Algorithm for Decentralised Coordination and Task Allocation of Unmanned Aerial Vehicles for Live Aerial Imagery Collection, pp. 469-476. Attachment

Delle Fave, Francesco Maria
Univ. of Southampton

Rogers, Alex
Univ. of Southampton

Xu, Zhe
The Univ. of Sydney

Sukkarieh, Salah
Univ. of Sydney

Jennings, Nick
Univ. of Southampton

TuB01.2

Mixed-Integer Quadratic Program Trajectory Generation for Heterogeneous Quadrotor Teams, pp. 477-483. Attachment

Mellinger, Daniel
Univ. of Pennsylvania

Kushleyev, Aleksandr
Univ. of Pennsylvania

Kumar, Vijay
Univ. of Pennsylvania

TuB01.3

Safety Verification of Reactive Controllers for UAV Flight in Cluttered Environments Using Barrier Certificates, pp. 484-490.

Barry, Andrew J.
Massachusetts Inst. of Tech.

Majumdar, Anirudha
Massachusetts Inst. of Tech.

Tedrake, Russ
Massachusetts Inst. of Tech.

TuB01.4

On-Board Velocity Estimation and Closed-Loop Control of a Quadrotor UAV Based on Optical Flow, pp. 491-497.
TuB01.5

11:30-11:45 Visual Terrain Classification by Flying Robots, pp. 498-503.
Khan, Yasir Niaz
Masselli, Andreas
Zell, Andreas
Univ. of Tübingen

TuB01.6

11:45-12:00 Real-Time Decentralized Search with Inter-Agent Collision Avoidance, pp. 504-510, Attachment
Gan, Seng Keat
Fitch, Robert
Sukkarieh, Salah
The Univ. of Sydney

TuB02

Meeting Room 2 (Chief Red Wing)

Human Like Biped Locomotion (Regular Session)
Chair: Laumond, Jean-Paul
LAAS-CNRS
Co-Chair: Morimoto, Jun
ATR Computational Neuroscience Lab.

10:30-10:45 Regulating Speed and Generating Large Speed Transitions in a Neuromuscular Human Walking Model, pp. 511-516.
Song, Seungmoon
Geyer, Hartmut
Carnegie Mellon Univ.

Suetani, Hiromichi
Ideta, Aiko
Morimoto, Jun
Kagoshima Univ.

11:00-11:15 Spatio-Temporal Synchronization of Periodic Movements by Style-Phase Adaptation: Application to Biped Walking, pp. 524-530, Attachment
Matsubara, Takamitsu
Uchikata, Akimasa
Morimoto, Jun
NAIST/ATR

Puydupin-Jamin, Anne-Sophie
Johnson, Miles
Bretl, Timothy
Univ. of Illinois at Urbana Champaign

Ahn, Jooeun
Klenk, Daniel
Hogan, Neville
MIT

TuB02.5

Motion Primitives for Human-Inspired Bipedal Robotic Locomotion: Walking and Stair Climbing, pp. 543-549, Attachment
Powell, Matthew
Huihua, Zhao
Ames, Aaron
Texas A&M Univ.

TuB02.6

TuB03

Meeting Room 3 (Mak'To)

Grasp Planning (Regular Session)
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<td>On the Synthesis of Feasible and Prehensile Robotic Grasps</td>
<td>Rosales Gallegos, Carlos (Univ. Pol. de Catalunya (UPC)), Suarez, Raul (Univ. Pol. de Catalunya (UPC)), Gabiccinii, Marco (Univ. di Pisa), Bicchii, Antonio (Univ. of Pisa)</td>
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<td>10:45-11:00</td>
<td>Pose Error Robust Grasping from Contact Wrench Space Metrics</td>
<td>Weisz, Jonathan (Columbia Univ.), Allen, Peter (Columbia Univ.)</td>
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<tr>
<td>11:00-11:15</td>
<td>Power Grasp Planning for Anthropomorphic Robot Hands</td>
<td>Roa, Maximo A. (German Aerospace Center, DLR), Argus, Maximilian (Durham Univ.), Leidner, Daniel (German Aerospace Center (DLR)), Borst, Christoph (German Aerospace Center (DLR)), Hirzinger, Gerd (German Aerospace Center (DLR))</td>
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<td>11:15-11:30</td>
<td>Navigation Functions Learning from Experiments: Application to Anthropomorphic Grasping</td>
<td>Filippidis, Ioannis (National Tech. Univ. of Athens), Kyriakopoulos, Kostas (National Tech. Univ. of Athens), Artemiadis, Panagiotis (Arizona State Univ.)</td>
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<tr>
<td>11:30-11:45</td>
<td>Toward Cloud-Based Grasping with Uncertainty in Shape: Estimating Lower Bounds on Achieving Force Closure with Zero-Slip Push Grasps</td>
<td>Kehoe, Ben (Univ. of California, Berkeley), Berenson, Dmitry (Univ. of California, Berkeley), Goldberg, Ken (UC Berkeley)</td>
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<tr>
<td>11:45-12:00</td>
<td>Combined Grasp and Manipulation Planning As a Trajectory Optimization Problem</td>
<td>Horowitz, Matanya (California Inst. of Tech.), Burdick, Joel (California Inst. of Tech.)</td>
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**TuB04**

**Pose Estimation (Regular Session)**

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<td>Persson, Sven Mikael (McGill Univ.), Sharf, Inna (McGill Univ.)</td>
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<td>Complementary Filtering Approach to Orientation Estimation Using Inertial Sensors Only</td>
<td>Kubelka, Vladimir (Czech Tech. Univ. in Prague, Faculty of Electrical Engi), Reinstein, Michal (Czech Tech. Univ. in Prague, Faculty of Electrical Engi)</td>
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<td>11:00-11:15</td>
<td>Design of Complementary Filter for High-Fidelity Attitude Estimation Based on Sensor Dynamics Compensation with Decoupled Properties</td>
<td>Masuya, Ken (Kyushu Univ.), Sugihara, Tomomichi (Graduate School of Engineering, Osaka Univ.), Yamamoto, Motoji (Kyushu Univ.)</td>
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</table>
A Low-Cost and Fail-Safe Inertial Navigation System for Airplanes, pp. 612-618. Attachment

Leutenegger, Stefan ETH Zurich
Siegwart, Roland ETH Zurich

11:30-11:45 TuB04.5

Robust Multi-Sensor, Day/Night 6-DOF Pose Estimation for a Dynamic Legged Vehicle in GPS-Denied Environments, pp. 619-626. Attachment

Ma, Jeremy Jet Propulsion Lab.
Susca, Sara Univ. of California Santa Barbara
Bajracharya, Max JPL
Matthies, Larry Jet Propulsion Lab.
Malchano, Matthew Boston Dynamics
Wooden, David Boston Dynamics

11:45-12:00 TuB04.6


Rehder, Joern Hamburg Univ. of Tech.
Gupta, Kamal Indian Inst. of Tech. Delhi
Nuske, Stephen CMU Robotics Inst.
Singh, Sanjiv Carnegie Mellon Univ.

TuB05 Meeting Room 5 (Ska)

Sensor Networks (Regular Session)

Chair: Hsieh, M. Ani Drexel Univ.
Co-Chair: Tan, Jindong Michigan Tech. Univ.

10:30-10:45 TuB05.1

Distributed Coverage with Mobile Robots on a Graph: Locational Optimization, pp. 634-641. Attachment

Yun, Seung-kook Honda Res. Inst.
Rus, Daniela MIT

10:45-11:00 TuB05.2


Bays, Matthew Virginia Tech.
Shende, Apoorva Virginia Tech.
Stilwell, Daniel Virginia Tech.

11:00-11:15 TuB05.3

On Coordination in Practical Multi-Robot Patrol, pp. 650-656.

Agmon, Noa The Univ. of Texas at Austin
Fok, Chien-Liang The Univ. of Texas at Austin
Elmaliah, Yehuda Bar-Ilan
Stone, Peter Univ. of Texas at Austin
Julien, Christine The Univ. of Texas at Austin
Vishwanath, Sriam The Univ. of Texas at Austin

11:15-11:30 TuB05.4


Huang, Shuo Michigan Tech. Univ.
Tan, Jindong Michigan Tech. Univ.

11:30-11:45 TuB05.5

Coverage Control of Mobile Sensors for Adaptive Search of Unknown Number of Targets, pp. 663-670.

Surana, Amit UTRC
Mathew, George United Tech. Res. Center
Kannan, Suresh United Tech. Res. Center

11:45-12:00 TuB05.6

Robust Optimal Deployment of Mobile Sensor Networks, pp. 671-676.

Hutchinson, Seth Univ. of Illinois
### TuB06

**Minimally Invasive Interventions I (Regular Session)**

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<td>Design Requirements and Feasibility Study for a 3-DOF MRI-Compatible Robotic Device for MRI-Guided Prostate Intervention</td>
<td>Bohren, Jonathan The Johns Hopkins Univ. Iordachita, Iulian Johns Hopkins Univ. Whitcomb, Louis The Johns Hopkins Univ.</td>
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<td>10:45-11:00</td>
<td>TuB06.2</td>
<td>Towards the Development of a SMA-Actuated MRI-Compatible Tendon-Driven Neurosurgical Robot</td>
<td>Ho, Mingyen Univ. of Maryland Desai, Jaydev P. Univ. of Maryland</td>
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<td>11:00-11:15</td>
<td>TuB06.3</td>
<td>Visual and Force-Feedback Guidance for Robot-Assisted Interventions in the Beating Heart with Real-Time MRI</td>
<td>Navkar, Nikhil Vishwas Univ. of Houston Deng, Zhigang Univ. of Houston Shah, Dipan J. Methodist DeBakey Heart &amp; Vascular Center Bekris, Kostas E. Univ. of Nevada, Reno Tsekos, Nikolaos Univ. of Houston</td>
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<tr>
<td>11:15-11:30</td>
<td>TuB06.4</td>
<td>Trans-Abdominal Active Magnetic Linkage for Robotic Surgery: Concept Definition and Model Assessment</td>
<td>Di Natali, Christian Vanderbilt Univ. Ranzani, Tommaso Scuola Superiore Sant'Anna Simi, Massimiliano Scuola Superiore Sant'Anna Menciassi, Arianna Scuola Superiore Sant'Anna - SSSA Valdastri, Pietro Vanderbilt Univ.</td>
</tr>
<tr>
<td>11:45-12:00</td>
<td>TuB06.6</td>
<td>Towards a Compact Robotically Steerable Thermal Ablation Probe</td>
<td>Graves, Carmen Massachusetts Inst. of Tech. Slocum, Alexander Massachusetts Inst. of Tech. Gupta, Rajiv Massachusetts General Hospital Walsh, Conor James Harvard Univ.</td>
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<td>Tung, Hsi-Wen ETH Zurich Frutiger, Dominic R. ETH Zurich Pane, Salvador ETH Zurich Nelson, Bradley J. ETH Zurich</td>
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**Three-Dimensional Control of Engineered Motile Cellular Microrobots**, pp. 721-726. 

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<tbody>
<tr>
<td>Kim, Dal Hyung</td>
<td>Drexel Univ.</td>
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<tr>
<td>Kim, Paul</td>
<td>Drexel Univ.</td>
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<tr>
<td>Julius, Agung</td>
<td>Rensselaer Pol. Inst.</td>
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<tr>
<td>Kim, MinJun</td>
<td>Drexel Univ.</td>
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### TuB07.3


<table>
<thead>
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<tbody>
<tr>
<td>Tabatabaei, Seyed N.</td>
<td>Ec. Pol. de Montreal</td>
</tr>
<tr>
<td>Sonia, Duchemin</td>
<td>Cerebrovascular Pharmacology Lab. Department of Pharmacol</td>
</tr>
<tr>
<td>Giouard, Hélène</td>
<td>Cerebrovascular Pharmacology Lab. Department of Pharmacol</td>
</tr>
<tr>
<td>Martel, Sylvain</td>
<td>Ec. Pol. de Montreal (EPM)</td>
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### TuB07.4


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<tr>
<td>Hu, Wenqi</td>
<td>Univ. of Hawaii at Manoa</td>
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<tr>
<td>Ishii, Kelly Ann</td>
<td>Univ. of Hawaii</td>
</tr>
<tr>
<td>Ohta, Aaron</td>
<td>Univ. of Hawai‘i at Mānoa</td>
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<tbody>
<tr>
<td>Pelrine, Ron</td>
<td>SRI International</td>
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<td>Wong-Foy, Annjo</td>
<td>SRI International</td>
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<td>McCoy, Brian</td>
<td>SRI International</td>
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<td>Holeman, Dennis</td>
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<td>Mahoney, Rich</td>
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<td>Myers, Greg</td>
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<td>Herson, Jim</td>
<td>SRI International</td>
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<td>Low, Thomas</td>
<td>SRI International</td>
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### TuB07.6


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<th>Authors</th>
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<tr>
<td>Yasui, Masato</td>
<td>Osaka Univ.</td>
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<tr>
<td>Ikeuchi, Masashi</td>
<td>The Univ. of Tokyo</td>
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<tr>
<td>Ikuta, Koji</td>
<td>The Univ. of Tokyo</td>
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### TuB08

**3D Surface Models, Point Cloud Processing** *(Regular Session)*

**Chair:** Pochiraju, Kishore  
**Co-Chair:** Burgard, Wolfram

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<td>TuB08.2</td>
<td>Stevens Inst. of Tech.</td>
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<td>10:45-11:00</td>
<td>TuB08.3</td>
<td>Univ. of Freiburg</td>
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<tr>
<td>Ruhnke, Michael</td>
<td>Univ. of Freiburg</td>
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<td>Kueemmerle, Rainer</td>
<td>Univ. of Freiburg</td>
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<td>Grisetti, Giorgio</td>
<td>Sapienza Univ. of Rome</td>
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<tr>
<td>Burgard, Wolfram</td>
<td>Univ. of Freiburg</td>
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<tr>
<td>McKinnon, David</td>
<td>QUT</td>
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<tr>
<td>Smith, Ryan N.</td>
<td>Queensland Univ. of Tech.</td>
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<td>Upcroft, Ben</td>
<td>Queensland Univ. of Tech.</td>
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<tr>
<td>von Dziegielewski, Andreas</td>
<td>Johannes Gutenberg-Univ. Mainz</td>
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<td>Hemmer, Michael</td>
<td>Tel Aviv Univ.</td>
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<td>Schömer, Elmar</td>
<td>Mainz Univ.</td>
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Chari, Visesh
Agrawal, Amit
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Ramalingam, Srikumar
INRIA Rhône-Alpes
Mitsubishi Electric Res. Lab.
Mitsubishi Electric Res. Lab.

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Steinbach, Eckehard
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Willow Garage Inc.
Tech. Univ. München
Munich Univ. of Tech.

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Stevens Inst. of Tech.

Chair: Oriolo, Giuseppe
Co-Chair: Mourikis, Anastasios
Univ. di Roma "La Sapienza"
Univ. of California, Riverside

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Franchi, Antonio
Oriolo, Giuseppe
Buehler, Heinrich H.
Univ. di Roma "La Sapienza"
Univ. di Roma "La Sapienza"
Max Planck Inst. for Biological Cybernetics
Univ. di Roma "La Sapienza"
Max Planck Inst. for Biol. Cybernetics

Prorok, Amanda
Gonon, Lukas
Martinoli, Alcherio
EPFL
ETH Zurich
EPFL

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Hansen, Peter
Dias, M. Bernardine
CMU Robotics Inst.
Carnegie Mellon Univ.
Carnegie Mellon Univ. in Qatar
Carnegie Mellon Univ.

Capping Computation Time and Storage Requirements for Appearance-Based Localization with CAT-SLAM, pp. 822-827.
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Milford, Michael J
Wyeth, Gordon
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Queensland Univ. of Tech.
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Li, Mingyang
Univ. of California, Riverside
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<td>Li, Zhibin, Tsagarakis, Nikolaos, Caldwell, Darwin G.</td>
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<td>Sung, Jaeyong, Ponce, Colin, Selman, Bart, Saxena, Ashutosh</td>
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<td>Malone, Nicholas, Rohrer, Brandon R., Tapia, Lydia, Lumia, Ron, Wood, John</td>
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<td>ZMP Stabilization of Rapid Mobile Manipulator, pp. 883-888.</td>
<td>Choi, Dongil</td>
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Monitoring of Manipulation Activities for a Service Robot Using Supervised Learning, pp. 930-935.

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UAV Vision: Feature Based Accurate Ground Target Localization through Propagated Initializations and Interframe Homographies, pp. 944-950.

Han, Kyuseo Purdue Univ.
Aeschliman, Chad Purdue Univ.
Park, Johnny Purdue Univ.
Kak, Avinash Purdue Univ.

15:00-15:15 TuC01.3

First Results in Autonomous Landing and Obstacle Avoidance by a Full-Scale Helicopter, pp. 951-956.

Scherer, Sebastian Carnegie Mellon Univ.
Chamberlain, Lyle Carnegie Mellon Univ.
Singh, Sanjiv Carnegie Mellon Univ.

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Weiss, Stephan ETH Zurich
Achtelik, Markus W. ETH Zurich, Autonomous Systems Lab.
Lynen, Simon ETH Zurich
Chli, Margarita ETH Zurich
Siegwart, Roland ETH Zurich

15:30-15:45 TuC01.5


Hung, Calvin Univ. of Sydney
Bryson, Mitch Univ. of Sydney
Sukkarieh, Salah Univ. of Sydney

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Lee, Daewon Seoul National Univ.
Ryan, Tyler Seoul National Univ.
Kim, H. Jin Seoul National Univ.

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Real-Time Footstep Planning for Humanoid Robots among 3D Obstacles Using a Hybrid Bounding Box, pp. 977-982. Attachment

Perrin, Nicolas Yves Istituto Italiano di Tecnologia
Stasse, Olivier CNRS
Lamiraux, Florent CNRS
Kim, Young J. Ewha Womans Univ.
Manocha, Dinesh UNC at Chapel Hill

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van Zutven, Pieter Eindhoven Univ. of Tech.
Kostic, Dragan Eindhoven Univ. of Tech.
Nijmeijer, Hendrik Eindhoven Univ. of Tech.

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A Framework for Extreme Locomotion Planning, pp. 989-996. Attachment

Dellin, Christopher Carnegie Mellon Univ.
Srinivasa, Siddhartha Carnegie Mellon Univ.
Hornung, Armin
Bennewitz, Maren
Univ. of Freiburg

Dominant Sources of Variability in Passive Walking, pp. 1003-1010. Attachment
Nanayakkara, Thrishantha
Byl, Katie
Liu, Hongbin
Song, Xiaojing
Villabona, Tim
King's Coll. Univ. of London
UCSB
King's Coll. London
King's Coll. London
Massachusetts Inst. of Tech.

First Steps Toward Underactuated Human-Inspired Bipedal Robotic Walking, pp. 1011-1017. Attachment
Ams, Aaron
Texas A&M Univ.

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Chair: Lee, Dongheui
Co-Chair: Xiao, Jing
Tech. Univ. of Munich
UNC-Charlotte

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Sarakoglou, Ioannis
Tsagarakis, Nikolaos
Caldwell, Darwin G.
Istituto Italiano di Tecnologia
Istituto Italiano di Tecnologia
Italian Inst. of Tech.

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Tech. Univ. of Munich
Tech. Univ. München

Robles, Jose
Sguerri, Matthew
Rorie, Conrad
Vu, Kim-Phuong
Strybel, Thomas
Marayong, Panadda
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California State Univ. Long Beach
California State Univ. Long Beach
California State Univ. Long Beach
California State Univ. Long Beach
California State Univ. Long Beach

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Kim, Yeongmi
Hernandez Arieta, Alejandro
Pfeifer, Rolf
Okamura, Allison M.
Univ. of Zurich
Univ. of Applied Sciences Deggendorf
ETH Zurich
Noser Engineering
Univ. of Zurich
Stanford Univ.

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Sase, Kazuya
Konno, Atsushi
Nakayama, Masano
Abe, Koyu
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Tohoku Univ.
Tohoku Univ.
Tohoku Univ.
Tohoku Univ.
Tohoku Univ.
Uchiyama, Masaru Tohoku Univ.
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Wang, Dangxiao Beihang Univ.
Liu, Shuai Beihang Univ.
Zhang, Xin Beihang Univ.
Zhang, Yuru Beihang Univ.
Xiao, Jing UNC-Charlotte

TuC04 Meeting Room 4 (Chief Wabasha)
Micro - Nanoscale Automation (Regular Session)
Chair: Popa, Dan The Univ. of Texas at Arlington
Co-Chair: Sun, Yu Univ. of Toronto
14:30-14:45 TuC04.1 Dynamic Region Control for Robot-Assisted Cell Manipulation Using Optical Tweezers, pp. 1057-1062.
Li, Xiang Nanyang Tech. Univ.
Cheah, C. C. Nanyang Tech. Univ.
14:45-15:00 TuC04.2 Automated Nanomanipulation for Nano Device Construction, pp. 1063-1068. Attachment
Zhang, Yanliang MathWorks
Li, Jason Univ. of Toronto
To, Steve Univ. of Toronto, Advanced Micro and Nanosystems Lab.
Zhang, Yong Univ. of Toronto
Ye, Xutao Univ. of Toronto
Sun, Yu Univ. of Toronto
15:00-15:15 TuC04.3 Parallel Teleoperation of Holographic Optical Tweezers Using Multi-Touch User Interface, pp. 1069-1074.
Onda, Kazuhisa Nagoya Univ.
Arai, Fumihito Nagoya Univ.
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Becker, Brian C. Carnegie Mellon University
MacLachlan, Robert A. Carnegie Mellon Univ.
Lobes, Louis A. Dept. of Ophthalmology, Univ. of Pittsburgh Medical Center,
Riviere, Cameron Carnegie Mellon Univ.
15:30-15:45 TuC04.5 Holonomic 5-DOF Magnetic Control of 1D Nanostructures, pp. 1081-1086.
Schuerle, Simone ETH Zurich
Peyer, Kathrin Eva ETH Zurich
Kratochvil, Bradley ETH Zurich
Nelson, Bradley J. ETH Zurich
15:45-16:00 TuC04.6 Interval Analysis for Robot Precision Evaluation, pp. 1087-1092.
Pac, Muhammed Rasid Univ. of Texas at Arlington
Popa, Dan The Univ. of Texas at Arlington

TuC05 Meeting Room 5 (Ska)
Multi-Robot Systems 1 (Regular Session)
Chair: Sukhatme, Gaurav Univ. of Southern California
Co-Chair: Martinoli, Alcherio EPFL
14:30-14:45 TuC05.1 Fully Distributed Scalable Smoothing and Mapping with Robust Multi-Robot Data Association, pp. 1093-1100.
Cunningham, Alexander Georgia Inst. of Tech.
Collaborative 3D Localization of Robots from Relative Pose Measurements Using Gradient Descent on Manifolds, pp. 1101-1106.

Knuth, Joseph
Barooah, Prabir

Distributed Source Seeking by Cooperative Robots: All-To-All and Limited Communications, pp. 1107-1112.

Li, Shuai
Guo, Yi


Antonelli, Gianluca
Marino, Alessandro
Chiaverini, Stefano

On Localization Uncertainty in an Autonomous Inspection, pp. 1119-1124.

Faigl, Jan
Krajnik, Tomas
Vonasek, Vojtech
Preucil, Libor

Probabilistic Spatial Mapping and Curve Tracking in Distributed Multi-Agent Systems, pp. 1125-1130.

Williams, Ryan
Sukhatme, Gaurav

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Morel, Yannick
Porez, Mathieu
Ijspeert, Auke

Localization of Small Objects with Electric Sense Based on Kalman Filter, pp. 1137-1142.

Lebastard, Vincent
Chevallereau, Christine
Girin, Alexis
Boyer, Frédéric
Gossiaux, Pol Bernard


von der Emde, Gerhard
Gebhardt, Kristina
Behr, Katharina


Mintchev, Stefano
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<td>Underwater Electro-Navigation in the Dark, pp. 1155-1160. Attachment</td>
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**Chair:** Trahanias, Panos (Foundation for Res. and Tech. – Hellas (FORTH))

**Co-Chair:** Alempijevic, Alen (Univ. of Tech. Sydney (FEIT))


Weak Constraints Network Optimiser, pp. 1270-1277. Attachment

Multi-Agent Deterministic Graph Mapping Via Robot Rendezvous, pp. 1278-1283.

The RoboEarth Language: Representing and Exchanging Knowledge about Actions, Objects, and Environments, pp. 1284-1289.

On Combining Visual SLAM and Dense Scene Flow to Increase the Robustness of Localization and Mapping in Dynamic Environments, pp. 1290-1297. Attachment

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**Integrated Online Localization and Navigation for People with Visual Impairments Using Smart Phones, pp. 1322-1329.**

**Attachment**

- Apostolopoulos, Ilias
- Fallah, Navid
- Folmer, Eelke
- Bekris, Kostas E.

**15:00-15:30**

**TuC210.2**

**Detection-Based Object Labeling in 3D Scenes, pp. 1330-1337.**

- Lai, Kevin
- Bo, Liefeng
- Ren, Xiaofeng
- Fox, Dieter

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**TuC210.3**

**Generation of Independent Contact Regions on Objects Reconstructed from Noisy Real-World Range Data, pp. 1338-1344.**

- Charusta, Krzysztof Andrzej
- Krug, Robert
- Stoyanov, Todor
- Dimitrov, Dimitar Nikolaev
- Iliev, Boyko

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**TuC210.4**

**A Multi-Sensor Visual Tracking System for Behavior Monitoring of At-Risk Children, pp. 1345-1350.**

- Sivalingam, Ravishankar
- Cherian, Anoop
- Fasching, Joshua
- Walczak, Nicholas
- Morellas, Vassilios
- Papanikolopoulos, Nikos
- Lim, Kelvin
- Sapiro, Guillermo
- Murphy, Barbara
- Bird, Nathaniel
- Cullen, Kathryn

**15:00-15:30**

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**Numerical Computation of Manipulator Singularities, pp. 1351-1358.**

- Bohigas, Oriol
- Zlatanov, Dimiter
- Ros, Lluis
- Manubens, Montserrat
- Porta, Josep M

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**TuC310**

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Occlusion-Aware Reconstruction and Manipulation of 3D Articulated Objects, pp. 1365-1371. Attachment
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Walker, Ian
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Kizaki, Takahiro
Namiki, Akio

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Tu, Ming-Han
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Casimir Based Impedance Control, pp. 1384-1391.
Sakai, Satoru
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Finger Flexion Force Sensor Based on Volar Displacement of Flexor Tendon, pp. 1392-1397.
Heo, Pilwon
Kim, Jung

A Compact Two DOF Magneto-Elastomeric Force Sensor for a Running Quadruped, pp. 1398-1403.
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Foong, Shaohui
Kim, Sangbae

Ohka, Masahiro
Matsunaga, Takuya
Nojima, Yu
Noda, Dajji
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A Computationally Fast Algorithm for Local Contact Shape and Pose Classification Using a Tactile Array Sensor, pp. 1410-1415.
Liu, Hongbin
Song, Xiaojing
Nanayakkara, Thrishantha
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Analysis of the Trade-Off between Resolution and Bandwidth for a Nanoforce Sensor Based on Diamagnetic Levitation, pp. 1416-1421.
### TuD01.6

**An Investigation of the Use of Linear Polarizers to Measure Force and Torque in Optical 6-DOF Force/Torque Sensors for Dexterous Manipulators**, pp. 1422-1427.

- Piat, Emmanuel (UFC ENSMM)
- Abadie, Joel (UFC ENSMM)
- Oster, Stéphane (Femto-st)

**Meeting Room 1 (Chief Black Eagle)**

17:45-18:00

### TuD02

**Humanoid Motion Planning and Control** (Regular Session)

**Meeting Room 2 (Chief Red Wing)**

**Chair:** Park, Frank (Seoul National Univ.)

**Co-Chair:** Khatib, Oussama (Stanford Univ.)

**16:30-16:45 TuD02.1**

**Controlling the Planar Motion of a Heavy Object by Pushing with a Humanoid Robot Using Dual-Arm Force Control**, pp. 1428-1435. **Attachment**

- Nozawa, Shunichi (The Univ. of Tokyo)
- Kakiuchi, Yohei (The Univ. of Tokyo)
- Okada, Kei (The Univ. of Tokyo)
- Inaba, Masayuki (The Univ. of Tokyo)

**16:45-17:00 TuD02.2**


- Ugurlu, Barkan (Toyota Tech. Inst.)
- Saglia, Jody Alessandro (Fondazione Istituto Italiano di Tecnologia)
- Tsagarakis, Nikolaos (Istituto Italiano di Tecnologia)
- Caldwell, Darwin G. (Italian Inst. of Tech.)

**17:00-17:15 TuD02.3**

**Humanoid Motion Optimization Via Nonlinear Dimension Reduction**, pp. 1444-1449.

- Kang, Hyuk (Seoul Nat'l Univ.)
- Park, Frank (Seoul National Univ.)

**17:15-17:30 TuD02.4**

**A Neurorobotic Model of Bipedal Locomotion Based on Principles of Human Neuromuscular Architecture**, pp. 1450-1455. **Attachment**

- Klein, Theresa (Univ. of Arizona)
- Lewis, M. Anthony (Univ. of Arizona)

**17:30-17:45 TuD02.5**

**Walking Control of Fully Actuated Robots Based on the Bipedal SLIP Model**, pp. 1456-1463.

- Garofalo, Gianluca (DLR)
- Ott, Christian (German Aerospace Center (DLR))
- Albu-Schäffer, Alin (DLR - German Aerospace Center)

**17:45-18:00 TuD02.6**


- Demircan, Emel (Stanford Univ.)
- Besier, Thor F. (Auckland Bioengineering Inst.)
- Khatib, Oussama (Stanford Univ.)

### TuD03

**Cable-Driven Mechanisms** (Regular Session)

**Meeting Room 3 (Mak’to)**

**Chair:** Gosselin, Clement (Univ. Laval)

**Co-Chair:** Ozawa, Ryuta (Ritsumeikan Univ.)

**16:30-16:45 TuD03.1**

**Novel Equilibrium-Point Control of Agonist-Antagonist System with Pneumatic Artificial Muscles**, pp. 1470-1475.
TuD03.2 Dynamic Trajectory Planning of a Two-DOF Cable-Suspended Parallel Robot, pp. 1476-1481.

Gosselin, Clement
Univ. Laval
Ren, Ping
Univ. Laval
Foucault, Simon
Univ. Laval

TuD03.3 Force-Closure of Spring- Loaded Cable-Driven Open Chains: Minimum Number of Cables Required & Influence of Spring Placements, pp. 1482-1487.

Mustafa, Shabbir Kurbanhusen
Singapore Inst. of Manufacturing Tech.
Agrawal, Sunil
Univ. of Delaware

TuD03.4 Development of a MR-Compatible Cable-Driven Manipulator: Design and Technological Issues, pp. 1488-1494.

Abdelaziz, Salih
LSIIT, Univ. of Strasbourg
Esteveny, Laure
LSIIT, Univ. of Strasbourg
Barbé, Laurent
Univ. of Strasbourg, LSIIT UMR CNRS
Renaud, Pierre
LSIIT, Strasbourg Univ.
Bayle, Bernard
Univ. of Strasbourg
de Mathelin, Michel
Univ. of Strasbourg

TuD03.5 Application of Unscented Kalman Filter to a Cable Driven Surgical Robot: A Simulation Study, pp. 1495-1500.

Ramadurai, Srikrishnan
Univ. of Washington
Nia Kosari, Sina
Univ. of Washington
King, H. Hawkeye
Univ. of Washington
Chizeck, Howard
Univ. of Washington
Hannahford, Blake
Univ. of Washington

TuD044.1 Joint Control of Tendon-Driven Mechanisms with Branching Tendons, pp. 1501-1507.

Sawada, Daisuke
Ritsumeikan Univ.
Ozawa, Ryuta
Ritsumeikan Univ.

TuD04

Force, Torque and Contacts in Grasping and Assembly (Regular Session) Meeting Room 4 (Chief Wabasha)

Chair: Prattichizzo, Domenico
Univ. di Siena
Co-Chair: Johansson, Rolf
Lund Univ.

Object Motion-Decoupled Internal Force Control for a Compliant Multifingered Hand, pp. 1508-1513.

Prattichizzo, Domenico
Univ. di Siena
Malvezzi, Monica
Univ. of Siena
Wimboeck, Thomas
German Aerospace Center (DLR)
Aggravi, Marco
Univ. of Siena

Robust, Inexpensive Resonant Frequency Based Contact Detection for Robotic Manipulators, pp. 1514-1519.

Backus, Spencer
Yale Univ.
Dollar, Aaron
Yale Univ.


Roberts, Dustyn
Pol. Inst. of New York Univ. (NYU-Pol.)
Poon, Jack
Pol. Inst. of New York Univ.
Patrick, Daniella
Pol. Inst. of New York Univ.
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#### 17:15-17:30
**Learning Grasping Force from Demonstration**, pp. 1526-1531.

- Kim, Joo H.  
  Pol. Inst. of New York Univ. (NYU-Pol.)

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- Lin, Yun  
  Univ. of South Florida
- Ren, Shaogang  
  Univ. of South Florida
- Clevenger, Matthew  
  Univ. of South Florida
- Sun, Yu  
  Univ. of South Florida

### TuD05

#### 16:30-16:45
**Distributed Value Functions for Multi-Robot Exploration**, pp. 1544-1550.

- Matignon, Laetitia  
  Univ. de Caen Basse-Normandie - GREYC/CNRS
- Jeanpierre, Laurent  
  Univ. of Caen
- Mouaddib, Abdel-Illah  
  GREYC-UMR 6072

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- Wang, Hua  
  Stevens Inst. of Tech.
- Guo, Yi  
  Stevens Inst. of Tech.

#### 17:15-17:30
**Distributed Formation Control of Unicycle Robots**, pp. 1564-1569.

- Sadowska, Anna  
  Queen Mary Univ. of London
- Kostic, Dragan  
  Eindhoven Univ. of Tech.
- van de Wouw, Nathan  
  Eindhoven Univ. of Tech.
- Huijbers, Henri  
  Queen Mary, Univ. of London
- Nijmeijer, Hendrik  
  Eindhoven Univ. of Tech.

#### 17:30-17:45

- Krontris, Athanasios  
  Univ. of Nevada, Reno
- Louis, Sushil  
  Univ. of Nevada, Reno
- Bekris, Kostas E.  
  Univ. of Nevada, Reno

### TuD06

#### 17:45-18:00

- Farrokhsiar, Morteza  
  UBC
- Najjaran, Homayoun  
  Univ. of British Columbia

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**TuD05**

**Multi-Robot Systems II (Regular Session)**

- **Chair:** Bekris, Kostas E.  
  Univ. of Nevada, Reno
- **Co-Chair:** Guo, Yi  
  Stevens Inst. of Tech.

- **Meeting Room 5 (Ska)**

#### 16:30-16:45
**Distributed Value Functions for Multi-Robot Exploration**

- Matignon, Laetitia  
  Univ. de Caen Basse-Normandie - GREYC/CNRS
- Jeanpierre, Laurent  
  Univ. of Caen
- Mouaddib, Abdel-Illah  
  GREYC-UMR 6072

#### 17:00-17:15
**Minimal Persistence Control on Dynamic Directed Graphs for Multi-Robot Formation**

- Wang, Hua  
  Stevens Inst. of Tech.
- Guo, Yi  
  Stevens Inst. of Tech.

#### 17:15-17:30
**Distributed Formation Control of Unicycle Robots**

- Sadowska, Anna  
  Queen Mary Univ. of London
- Kostic, Dragan  
  Eindhoven Univ. of Tech.
- van de Wouw, Nathan  
  Eindhoven Univ. of Tech.
- Huijbers, Henri  
  Queen Mary, Univ. of London
- Nijmeijer, Hendrik  
  Eindhoven Univ. of Tech.

#### 17:30-17:45
**Multi-Level Formation Roadmaps for Collision-Free Dynamic Shape Changes with Non-Holonomic Teams**

- Krontris, Athanasios  
  Univ. of Nevada, Reno
- Louis, Sushil  
  Univ. of Nevada, Reno
- Bekris, Kostas E.  
  Univ. of Nevada, Reno

#### 17:45-18:00
**An Unscented Model Predictive Control Approach to the Formation Control of Nonholonomic Mobile Robots**

- Farrokhsiar, Morteza  
  UBC
- Najjaran, Homayoun  
  Univ. of British Columbia
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**Needle Steering (Regular Session)**

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Tun Latt, Win  
Yang, Guang-Zhong |
| 16:45-17:00  | TuD06.2 | An Optical Actuation System and Curvature Sensor for a MR-Compatible Active Needle, pp. 1589-1594. | Ryu, Seok Chang  
Quek, Zhan Fan  
Renaud, Pierre  
Black, Richard J.  
Daniel, Bruce  
Cutkosky, Mark |
| 17:00-17:15  | TuD06.3 | Semi-Automatic Needle Steering System with Robotic Manipulator, pp. 1595-1600. | Bernardes, Mariana Costa  
Adorno, Bruno Vilhena  
Poignet, Philippe  
Borges, Geovany Araujo |
| 17:15-17:30  | TuD06.4 | Torsional Dynamics Compensation Enhances Robotic Control of Tip-Steerable Needles, pp. 1601-1606. | Swensen, John  
Cowan, Noah J. |
| 17:30-17:45  | TuD06.5 | The Impact of Interaction Model on Stability and Transparency in Bilateral Teleoperation for Medical Applications, pp. 1607-1613. | Sanchez Secades, Luis Alonso  
Le, Minh-Quyen  
Liu, Chao  
Zemiti, Nabil  
Poignet, Philippe |
| 17:45-18:00  | TuD06.6 | Towards a Discretely Actuated Steerable Cannula, pp. 1614-1619. | Ayvali, Elif  
Desai, Jaydev P. |

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Himmelsbach, Michael  
Wuensche, Hans J |
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From Object Categories to Grasp Transfer Using Probabilistic Reasoning, pp. 1716-1723.


Xu, Zhe, The Univ. of Sydney
Fitch, Robert, Univ. of Sydney
Sukkarieh, Salah, Univ. of Sydney

Short Range 3D Depth Sensing Via Multiple Intensity Differentiation, pp. 1760-1765.

Um, Dugan, Texas A&M Univ. - CC
Ryu, Dongseok, Texas A&M Univ. Christi
Kal, Myung Joon, DINAST
Kang, Sungchul, Korea Inst. of Science & Tech.

A Conditional Random Field Model for Place and Object Classification, pp. 1766-1772.

Rogers III, John G., Georgia Inst. of Tech.
Christensen, Henrik Iskov, Georgia Inst. of Tech.

XRobots: A Flexible Language for Programming Mobile Robots Based on Hierarchical State Machines, pp. 1773-1778.

Tousignant, Steve, Univ. of Minnesota
Van Wyk, Eric, Univ. of Minnesota
Gini, Maria, Univ. of Minnesota

The Toggle Local Planner for Sampling-Based Motion Planning, pp. 1779-1786.

Denny, Jory, Texas A&M Univ.
Amato, Nancy, Texas A&M Univ.

Cautious Greedy Strategy for Bearing-Based Active Localization: Experiments and Theoretical Analysis, pp. 1787-1792.

Vander Hook, Joshua, Univ. of Minnesota
Tokekar, Pratap, Univ. of Minnesota
Isler, Volkman, Univ. of Minnesota

Compact Covariance Descriptors in 3D Point Clouds for Object Recognition, pp. 1793-1798.

Fehr, Duc, Univ. of Minnesota
Cherian, Anoop, U. of Minnesota
Sivalingam, Ravishankar, Univ. of Minnesota
Nickolay, Sam, UMN
Morellas, Vassilios, U. of Minnesota
Papanikolopoulos, Nikos, Univ. of Minnesota

On-Line Next Best Grasp Selection for In-Hand Object 3D Modeling with Dual-Arm Coordination, pp. 1799-1804.

Tsuda, Atsushi, The Univ. of Tokyo
Kakiuchi, Yohei, The Univ. of Tokyo
Nozawa, Shunichi, The Univ. of Tokyo
Ueda, Ryohei, The Univ. of Tokyo
Okada, Kei, The Univ. of Tokyo
Inaba, Masayuki, The Univ. of Tokyo
### Efficient Task Execution and Refinement through Multi-Resolution Corrective Demonstration, pp. 1805-1810.

Mericli, Cetin  
Veloso, Manuela  
Akin, H. Levent  

Carnegie Mellon Univ.  
Carnegie Mellon Univ.  
Bogazici Univ.

### TuD310

**Interactive Session TuD-3 (Interactive Session)**

| Chair: Meng, Max Q.-H. | The Chinese Univ. of Hong Kong |
| Co-Chair: Tokekar, Pratap | Univ. of Minnesota |

17:30-18:00  

**TuD310.1**

*Maintaining Visibility for Leader-Follower Formations in Obstacle Environments, pp. 1811-1816.*

Panagou, Dimitra  
Kumar, Vijay  

National Tech. Univ. of Athens  
Univ. of Pennsylvania

17:30-18:00  

**TuD310.2**

**WISS, a Speaker Identification System for Mobile Robots, pp. 1817-1822.**

Grondin, Francois  
Michaud, Francois  

Univ. de Sherbrooke  
Univ. de Sherbrooke

17:30-18:00  

**TuD310.3**

**A Novel Correspondence Searching Strategy in Multiocular Vision, pp. 1823-1828.**

Wei, Ning  
Li, Baopu  
He, Qing  
Hu, Chao  
Meng, Max Q.-H.  

Shenzhen Inst. of Advanced Tech. Chinese Acad. of Sci  
Chinese Univ. of Hong Kong  
Shenzhen Inst. of Advanced Tech. CAS  
SIAT  
The Chinese Univ. of Hong Kong

17:30-18:00  

**TuD310.4**

**Results with Autonomous Vehicles Operating in Specialty Crops, pp. 1829-1835.**

Bergerman, Marcel  
Singh, Sanjiv  
Hamner, Brad  

Carnegie Mellon Univ.  
Carnegie Mellon Univ.  
Carnegie Mellon Univ.

17:30-18:00  

**TuD310.5**

**RDIS: Generalizing Domain Concepts to Specify Device to Framework Mappings, pp. 1836-1841.**

Anderson, Monica  
Kilgo, Paul  
Bowman, Jason  

The Univ. of Alabama  
The Univ. of Alabama  
The Univ. of Alabama
### Technical Program for Wednesday May 16, 2012

#### WeA01

**Meeting Room 1 (Mini-sota)**

### Learning and Adaptation Control of Robotic Systems II (Regular Session)

**Chair:** Billard, Aude  
**Co-Chair:** Zucker, Matthew  
*EPFL*

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| 08:30-08:45   | WeA01.1 | Online Learning of Varying Stiffness through Physical Human-Robot Interaction, pp. 1842-1849. Attachment | Kronander, Klas  
               |                     | Billard, Aude  
               |         | Learning Algorithms and Systems Lab. EPFL  
               |         | EPFL |
| 08:45-09:00   | WeA01.2 | Reinforcement Planning: RL for Optimal Planners, pp. 1850-1855. Attachment | Zucker, Matthew  
               |                     | Bagnell, James  
               |         | Carnegie Mellon Univ. |
| 09:00-09:15   | WeA01.3 | Adaptive Collaborative Estimation of Multi-Agent Mobile Robotic Systems, pp. 1856-1861. | Nestinger, Stephen  
               |                     | Demetriou, Michael  
               |         | Worcester Pol. Inst.  
               |         | Worcester Pol. Inst. |
| 09:15-09:30   | WeA01.4 | Lingodroids: Learning Terms for Time, pp. 1862-1867. | Heath, Scott Christopher  
               |                     | Schulz, Ruth  
               |         | The Univ. of Queensland  
               |         | The Univ. of Queensland  
               |         | Univ. of Queensland |
| 09:30-09:45   | WeA01.5 | Teaching Nullspace Constraints in Physical Human-Robot Interaction Using Reservoir Computing, pp. 1868-1875. | Nordmann, Ame  
               |                     | Emmerich, Christian  
               |         | Bielefeld Univ.  
               |         | Bielefeld Univ. |
| 09:45-10:00   | WeA01.6 | A Bayesian Nonparametric Approach to Modeling Battery Health, pp. 1876-1882. | Joseph, Joshua  
               |                     | Doshi, Finale  
               |         | Massachusetts Inst. of Tech.  
               |         | MIT |

#### WeA02

**Meeting Room 2 (Chief Red Wing)**

### Multi-Legged Robots (Regular Session)

**Chair:** Sharf, Inna  
**Co-Chair:** Kim, Sangbae  
*McGill Univ.*  
*Massachusetts Inst. of Tech.*

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| 08:30-08:45   | WeA02.1 | Stable Dynamic Walking of a Quadruped "Kotetsu" Using Phase Modulations Based on Leg Loading/Unloading against a Lateral Perturbation, pp. 1883-1888. | Maufroy, Christophe  
               |                     | Kimura, Hiroshi  
               |         | Kyoto Inst. of Tech.  
               |         | Takemoto Denki Co. |
| 08:45-09:00   | WeA02.2 | Dynamic Torque Control of a Hydraulic Quadruped Robot, pp. 1889-1894. Attachment | Boaventura, Thiago  
               |                     | Semini, Claudio  
               |         | Italian Inst. of Tech.  
               |         | Italian Inst. of Tech.  
               |         | Italian Inst. of Tech.  
               |         | Italian Inst. of Tech. |
Frigerio, Marco, Univ. of Genoa and Italian Inst. of Tech.
Focchi, Michele, Italian Inst. of Tech.
Caldwell, Darwin G., Italian Inst. of Tech.

09:00-09:15, WeA02.3
Thomson, Travis, McGill Univ.
Sharf, Inna, McGill Univ.
Beckman, Blake, Defence Res. and Development Canada

09:15-09:30, WeA02.4
Valenzuela, Andres, Massachusetts Inst. of Tech.
Kim, Sangbae, Massachusetts Inst. of Tech.

09:30-09:45, WeA02.5
Piovan, Giulia, UCSB
Byl, Katie, UCSB

09:45-10:00, WeA02.6
Beranek, Richard, Carleton Univ.
Ahmadi, Mojtaba, Carleton Univ.

WeA03
Medical Robotics I (Regular Session)
Meeting Room 3 (Mak’to)
Chair: Simaan, Nabil, Vanderbilt Univ.
Co-Chair: Riviere, Cameron, Carnegie Mellon Univ.

08:30-08:45, WeA03.1
Gosline, Andrew, Children's Hospital Boston, Harvard Medical School
Vasilyev, Nikolay, Children's Hospital Boston and Harvard Medical School
Veeramani, Arun, MicroFabrica Inc, Van Nuys, CA
Wu, MingTing, MicroFabrica Inc, Van Nuys, CA
Schmitz, Greg, MicroFabrica Inc, Van Nuys, CA
Chen, Rich, Microfabrica, Inc.
Arabagi, Veaceslav, Children's Hospital Boston
Del Nido, Pedro, Children's Hospital Boston and Harvard Medical School
Dupont, Pierre, Children's Hospital Boston, Harvard Medical School

08:45-09:00, WeA03.2
Motion Planning for Multiple Millimeter-Scale Magnetic Capsules in a Fluid Environment, pp. 1927-1932.
Vartholomeos, Panagiotis, Children's Hospital Boston, Harvard Medical School
Akhavan-Sharif, Reza, Department of Radiology, Beth Israel Deaconess Medical Center, Boston
Dupont, Pierre, Children's Hospital Boston, Harvard Medical School

09:00-09:15, WeA03.3
Geometry Effect of Preloading Probe on Accurate Needle Insertion for Breast Tumor Treatment, pp. 1933-1938.
Hatano, Maya, Waseda Univ.
Kobayashi, Yo, Waseda Univ.
Suzuki, Makiko, Waseda Univ.
Fuji, Masakatsu G., Waseda Univ.
Shiraishi, Yasuyuki, Tohoku Univ.
Yambe, Tomoyuki, Tohoku Univ.
Hashizume, Makoto, Kyushu Univ.

09:15-09:30, WeA03.4
Design and Analysis of 6 DOF Handheld Micromanipulator, pp. 1946-1951.
Yang, Sungwook Carnegie Mellon Univ.
MacLachlan, Robert A. Carnegie Mellon Univ.
Riviere, Cameron Carnegie Mellon Univ.

Florez, Juan Manuel Inst. de Systèmes Intelligents et de Robotique - Univ. P
Szewczyk, Jérôme Univ. Pierre et Marie Curie-Paris 6
Morel, Guillaume Univ. Pierre et Marie Curie - Paris 6

Okada, Masafumi Tokyo Inst. of Tech.
Takeda, Yushi Tokyo Inst. of Tech.

Hirose, Toshinori Panasonic Corp.
Fujikoka, Soichiro Panasonic Corp.
Mizuno, Osamu Panasonic Corp.
Nakamura, Tohru Panasonic Corp.

Chen, Fei Nagoya Univ.
Sekiyama, Kosuke Nagoya Univ.
Di, Pei Nagoya Univ.
Huang, Jian Huazhong Univ. of Science and Tech.
Fukuda, Toshio Nagoya Univ.

Yamada, Hiroya Tokyo Inst. of Tech.

### WeA05

**Embodied Intelligence - Icub (Invited Session)**

**Chair:** Metta, Giorgio  
**Co-Chair:** Natale, Lorenzo

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| WeA05.1 | Learning Reusable Task Components Using Hierarchical Activity Grammars with Uncertainties (I) | Lee, Kyuhwa, Imperial Coll. of Science, Tech. and Medicine  
Kim, Tae-Kyun, Imperial Coll. London  
Demiris, Yiannis, Imperial Coll. London |
| WeA05.2 | Stabilization for the Compliant Humanoid Robot COMAN Exploiting Intrinsic and Controlled Compliance (I) | Li, Zhibin, Italian Inst. of Tech.  
Vanderborght, Bram, Vrije Univ. Brussel  
Tsagarakis, Nikolaos, Istituto Italiano di Tecnologia  
Colasanto, Luca, Istituto Italiano di Tecnologia  
Caldwell, Darwin G., Italian Inst. of Tech. |
| WeA05.3 | Efficient Human-Like Walking for the COmpliant Humanoid COMAN Based on Kinematic Motion Primitives (kMPs) (I) | Moro, Federico Lorenzo, Istituto Italiano di Tecnologia  
Tsagarakis, Nikolaos, Istituto Italiano di Tecnologia  
Caldwell, Darwin G., Italian Inst. of Tech. |
| WeA05.4 | Closed-Loop Primitives: A Method to Generate and Recognize Reaching Actions from Demonstration (I) | Parlaktuna, Mustafa, Middle East Tech. Univ.  
Tunaoglu, Doruk, Middle East Tech. Univ.  
Ugur, Emre, National Inst. of Information and Communications Tech. (Sahin, Erol, Middle East Tech. Univ. |
| WeA05.5 | Active Object Recognition on a Humanoid Robot (I) | Browatzki, Bjoern, Max Planck Inst. for Biol. Cybernetics  
Tikhanoff, Vadim, Italian Inst. of Tech.  
Metta, Giorgio, Istituto Italiano di Tecnologia (IIT)  
Buelthoff, Heinrich H., Max Planck Inst. for Biol. Cybernetics  
Wallraven, Christian, Korea Univ. |
| WeA05.6 | Imitation Learning of Non-Linear Point-To-Point Robot Motions Using Dirichlet Processes (I) | Krueger, Volker, Aalborg Univ.  
Tikhanoff, Vadim, Italian Inst. of Tech.  
Natale, Lorenzo, Istituto Italiano di Tecnologia  
Sandini, Giulio, ITALIAN Inst. OF Tech. |

### WeA06

**Trajectory Planning and Generation (Regular Session)**

**Chair:** Kroeger, Torsten  
**Co-Chair:** Hauser, Kris

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| WeA06.1 | Optimal Acceleration-Bounded Trajectory Planning in Dynamic Environments Along a Specified Path | Johnson, Jeffrey, Indiana Univ.  
Hauser, Kris, Indiana Univ. |
| WeA06.2 | Robot Excitation Trajectories for Dynamic Parameter Estimation Using Optimized B-Splines | Johnson, Jeffrey, Indiana Univ.  
Hauser, Kris, Indiana Univ. |
On-Line Trajectory Generation: Nonconstant Motion Constraints, pp. 2048-2054.

Setpoint Scheduling for Autonomous Vehicle Controllers, pp. 2055-2060.

A Real-Time Motion Planner with Trajectory Optimization for Autonomous Vehicles, pp. 2061-2067.

Improved Non-Linear Spline Fitting for Teaching Trajectories to Mobile Robots, pp. 2068-2073.

On the Number of Local Minima to the Point Feature Based SLAM Problem, pp. 2074-2079.

On the Comparison of Uncertainty Criteria for Active SLAM, pp. 2080-2087.

Continuous-Time Batch Estimation Using Temporal Basis Functions, pp. 2088-2095.

SLAM with Single Cluster PHD Filters, pp. 2096-2101.

Simultaneous Localization and Scene Reconstruction with Monocular Camera, pp. 2102-2107.
Rhythm-Based Adaptive Localization in Incomplete RFID Landmark Environments, pp. 2108-2114.
- Kodaka, Kenri
- Ogata, Tetsuya
- Sugano, Shigeki

Motion Path Planning I (Regular Session)
Chair: Dasgupta, Raj
Co-Chair: Simmons, Reid

Navigation Functions for Everywhere Partially Sufficiently Curved Worlds, pp. 2115-2120.
- Filippidis, Ioannis
- Kyriakopoulos, Kostas

A Singularity-Free Path Planner for Closed-Chain Manipulators, pp. 2128-2134.
- Bohigas, Oriol
- Henderson, Michael E.
- Ros, Lluis
- Porta, Josep M

Comparison of Constrained Geometric Approximation Strategies for Planar Information States, pp. 2135-2140.
- Song, Yang
- O’Kane, Jason

Voxel-Based Motion Bounding and Workspace Estimation for Robotic Manipulators, pp. 2141-2146. Attachment
- Anderson-Sprecher, Peter
- Simmons, Reid

Branch and Bound for Informative Path Planning, pp. 2147-2154.
- Binney, Jonathan
- Sukhatme, Gaurav

- Amigoni, Francesco
- Basilico, Nicola

Online Patrolling Using Hierarchical Spatial Representations, pp. 2163-2169.
- Basilico, Nicola
- Carpin, Stefano
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Shao, Xiaowei
Zhang, Quanshi
Shibasaki, Ryosuke
Zhao, Huijing
Zha, Hongbin

Univ. of Tokyo
Univ. of Tokyo
Univ. of Tokyo
Univ. of Tokyo
Peking Univ.
Peking Univ.

09:15-09:30
WeA09.4

Strong Shadow Removal Via Patch-Based Shadow Edge Detection, pp. 2177-2182.

Wu, Qi
Zhang, Wende
Vijaya Kumar, B.V.K

Carnegie Mellon Univ.
General Motors
Carnegie Mellon Univ.

09:30-09:45
WeA09.5

Integrated Probabilistic Generative Model for Detecting Smoke on Visual Images, pp. 2183-2188. Attachment

Vidal-Calleja, Teresa A.
Agamennoni, Gabriel

Univ. of Sydney
The Univ. of Sydney

09:45-10:00
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Lourenço, Miguel
Pedro, Vitor Manuel
Barreto, João P.

Univ. of Coimbra
Univ. of Coimbra
Univ. of Coimbra

WeA110
Interactive Session WeA-1 (Interactive Session)

Chair: Christensen, Henrik Iskov
Co-Chair: Luo, Ren

Georgia Inst. of Tech.
National Taiwan Univ.

08:30-09:00
WeA110.1

Control of Biological Clock Activity Capsulated by Lipid-Mono-Layer, pp. 2196-2201.

Kojima, Masaru
Nakajima, Masahiro
Takiguchi, Kingo
Kondo, Takao
Homma, Michio
Fukuda, Toshio

Nagoya Univ.
Nagoya Univ.
Nagoya Univ.
Nagoya Univ.
Nagoya Univ.
Nagoya Univ.

08:30-09:00
WeA110.2

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Sa, Inkyu
Corke, Peter

Queensland Univ. of Tech.
QUT

08:30-09:00
WeA110.3


Murakami, Kouji
Matsuo, Kazuya
Hasegawa, Tsutomu
Kurazume, Ryo

Kyushu Sangyo Univ.
RIKEN
Kyushu Univ.
Kyushu Univ.

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A New Strategy for Making a Knot with a General-Purpose Arm, pp. 2217-2222.

Trinh, Van Vinh
Tomizawa, Tetsuo
Kudoh, Shunsuke
Suehiro, Takashi

The Univ. of Electro-Communications
Univ. of Electoronics and Communications
The Univ. of Electro-Communications
the Univ. of Electro-Communications

08:30-09:00
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Impact Dynamics of a Finger Mechanism with Application to Onset of a Cart Motion, pp. 2223-2228. Attachment
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Chair: Christensen, Henrik Iskov
Co-Chair: Luo, Ren

09:00-09:30
Sadrpour, Amir
Jin, Jionghua
Ulsoy, A. Galip

09:00-09:30
Region of Attraction Estimation for a Perching Aircraft: A Lyapunov Method Exploiting Barrier Certificates, pp. 2235-2242.
Glassman, Elena Leah
Lussier Desbiens, Alexis
Tobenkin, Mark
Cutkosky, Mark
Tedrake, Russ

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Concurrent Indoor Map Construction and Patterns of Interests Recognition Using Sensory Fusion Approach for Service Robotics, pp. 2243-2248.
Luo, Ren
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Simple Model and Deformation Control of a Flexible Rope Using Constant, High-Speed Motion of a Robot Arm, pp. 2249-2254.
Yamakawa, Yuji
Namiki, Akio
Ishikawa, Masatoshi

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Tietz, Brian R.
Bender, John A.
Webster, Victoria A.
Szczechinski, Nicholas S.
Branicky, Michael
Ritzmann, Roy Earl
Quinn, Roger, D.

WeA310
Interactive Session WeA-3 (Interactive Session)

Chair: Christensen, Henrik Iskov
Co-Chair: Luo, Ren

09:30-10:00
A Stochastic Algorithm for Explorative Goal Seeking Extracted from Cockroach Walking Data, pp. 2261-2268
Daltorio, Kathryn A
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De Schutter, Joris
Bruyninckx, Herman
Katholieke Univ. Leuven

Kim, Hanguen
Lee, Taehwan
Chung, Hyun
Sun, Namsun
Myung, Hyun
KAIST
Korea Ocean Res. and Development Inst.

Pick and Place Planning for Dual-Arm Manipulators, pp. 2281-2286. Attachment
Harada, Kensuke
Foissotte, Torea
Tsujii, Tokuo
Nagata, Kazuyuki
Yamanobe, Natsuki
Nakamura, Akira
Kawai, Yoshiiro
National Inst. of AIST
Vision and Manipulation Res. Group, Intelligent SystemsResea
National Inst. of AIST
National Inst. of AIST
Advanced Industrial Science and Tech.
National Inst. of Advanced Industrial Science andTechnology
National Inst. of Advanced Industrial Science and Tech.

Learning Human Reach-To-Grasp Strategies: Towards EMG-Based Control of Robotic Arm-Hand Systems, pp. 2287-2292.
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Artemiadis, Panagiotis
Katsiaris, Pantelis
Kyriakopoulos, Kostas
Manolakos, Elias
National Tech. Univ. of Athens
Arizona State Univ.
National Tech. Univ. of Athens
National Tech. Univ. of Athens
Department of Informatics and Telecommunications, Univ. of

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Chair: Merlet, Jean-Pierre
Co-Chair: Gouttefarde, Marc
INRIA
LIRMM

The Octahedral Manipulator Revisited, pp. 2293-2298.
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Borràs Sol, Júlia
Thomas, Federico
IRI (CSIC-UPC)
Yale Univ.
CSIC-UPC

Simplified Static Analysis of Large-Dimension Parallel Cable-Driven Robots, pp. 2299-2305.
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Collard, Jean-François
Riehl, Nicolas
Baradat, Cédric
LIRMM
Lab. d'Informatique, de Robotique et de Microélectronique
LIRMM
Fondation Tecnalia

Yu, Yong
Liang, WenYuan
Yagoshima Univ.
Univ. of Science and Tech. of China

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Merlet, Jean-Pierre
INRIA

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<td>Chai, Xiaoming Tsinghua Univ. Tang, Xiaoqiang Tsinghua Univ. Tang, Lewei Tsinghua Univ. Lu, Qiujian Tsinghua Univ.</td>
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<td>Co-Chair: Clark, Jonathan Florida State Univ.</td>
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<td>An, Sang-ik Korea Advanced Inst. of Science and Tech. (KAIST) Oh, Yonghwan KIST Kwon, Dong-Soo KAIST</td>
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<td>Co-Chair: Saxena, Ashutosh Cornell Univ.</td>
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<td>Hudson, Nicolas Jet Propulsion Lab.</td>
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Pastor, Peter Univ. of Southern California
Kalakrishnan, Mrinal Univ. of Southern California
Righetti, Ludovic Univ. of Southern California
Asfour, Tamim Karlsruhe Inst. of Tech. (KIT)
Schaal, Stefan Univ. of Southern California

11:00-11:15 WeB03.3
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Jiang, Yun Cornell Univ.
Amend, John Cornell Univ.
Lipson, Hod Cornell Univ.
Saxena, Ashutosh Cornell Univ.

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Dang, Hao Columbia Univ.
Allen, Peter Columbia Univ.

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Learning to Slide a Magnetic Card through a Card Reader, pp. 2398-2404. Attachment
Sukhoy, Vladimir Iowa State Univ.
Georgiev, Veselin Southeast Missouri State Univ.
Wegter, Todd Iowa State Univ.
Sweidan, Ramy Rice Univ.
Stoytchev, Alexander Iowa State Univ.

11:45-12:00 WeB03.6
Combined Shape, Appearance and Silhouette for Simultaneous Manipulator and Object Tracking, pp. 2405-2412.
Hebert, Paul California Inst. of Tech.
Hudson, Nicolas Jet Propulsion Lab.
Ma, Jeremy Jet Propulsion Lab.
Howard, Tom Jet Propulsion Lab.
Fuchs, Thomas California Inst. of Tech.
Bajracharya, Max JPL
Burdick, Joel California Inst. of Tech.

WeB04
Networked Robots (Regular Session)
Meeting Room 4 (Chief Wabasha)
Chair: Chopra, Nikhil Univ. of Maryland, Coll. Park
Co-Chair: Kim, H. Jin Seoul National Univ.

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Bae, Joonbum UNIST
Zhang, Wenlong Univ. of California at Berkeley
Tomizuka, Masayoshi Univ. of California
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   Fink, Jonathan ARL
   Ribeiro, Alejandro Univ. of Pennsylvania
   Kumar, Vijay Univ. of Pennsylvania

11:00-11:15 WeB04.3

Decentralised Information Gathering with Communication Costs, pp. 2427-2432.
   Kassir, Abdallah ACFR, The Univ. of Sydney
   Fitch, Robert Univ. of Sydney
   Sukkarieh, Salah Univ. of Sydney

11:15-11:30 WeB04.4

Decentralized Connectivity Maintenance for Networked Lagrangian Dynamical Systems, pp. 2433-2438. Attachment
   Sabattini, Lorenzo Univ. of Modena and Reggio Emilia
   Secchi, Cristian Univ. of Modena & Reggio Emilia
   Chopra, Nikhil Univ. of Maryland, Coll. Park

11:30-11:45 WeB04.5

   Kim, Woojin Seoul National Univ.
   Yoo, Jae Hyun Seoul National Univ.
   Kim, H. Jin Seoul National Univ.

11:45-12:00 WeB04.6

   Rust, Ian MIT
   Asada, Harry MIT

WeB05

Rehabilitation Robotics (Regular Session)

Chair: Dubey, Rajiv Univ. of South Florida
Co-Chair: Masia, Lorenzo Italian Inst. of Tech.

10:30-10:45 WeB05.1

WeeBot: A Novel Method for Infant Control of a Robotic Mobility Device, pp. 2451-2456.
   Stansfield, Sharon Ithaca Coll.
   Dennis, Carole Ithaca Coll.
   Larin, Helene Ithaca Coll.

10:45-11:00 WeB05.2

Transition from Mechanical Arm to Human Arm with CAREX: A Cable Driven Arm Exoskeleton (CAREX) for Neural Rehabilitation, pp. 2457-2462.
   Mao, Ying Univ. of Delaware
   Agrawal, Sunil Univ. of Delaware

11:00-11:15 WeB05.3

   Grimmer, Martin TU Darmstadt
   Seyfarth, Andre TU Darmstadt
   Eslamy, Mahdy Lauflabor Jena

11:15-11:30 WeB05.4

Measuring End-Point Stiffness by Means of a Modular Mechatronic System, pp. 2471-2478. Attachment
   Masia, Lorenzo Italian Inst. of Tech.
   Squeri, Valentina Univ. di Genova
   Sandini, Giulio Italian Inst. of Tech.
   Morasso, Pietro Giovanni Univ. of Genoa

11:30-11:45 WeB05.5
Ergin, Mehmet Alper  
Patoglu, Volkan  
Sabanci Univ.

11:45-12:00  
**WeB05.6**

**Adaptive Control of a Human-Driven Knee Joint Orthosis**, pp. 2486-2491.
Rifai, Hala  
Mohammed, Samer  
Daachi, Boubaker  
Amirat, Yacine  
Univ. of Paris Est Créteil  
Univ. of Paris Est Créteil - (UPEC)  
Univ. of Paris Est Créteil (UPEC)  
Univ. of Paris Est Créteil (UPEC)

**WeB06**  
**Micro and Nano Robots II (Regular Session)**  
Meeting Room 6 (Oya'te)

Chair: Akella, Srinivas  
Co-Chair: Arai, Fumihito  
Univ. of North Carolina at Charlotte  
Nagoya Univ.

10:30-10:45  
**WeB06.1**

**Motion Control of Tetrahymena Pyriformis Cells with Artificial Magnetotaxis: Model Predictive Control (MPC) Approach**, pp. 2492-2497.
Ou, Yan  
Kim, Dal Hyung  
Kim, Paul  
Kim, MinJun  
Julius, Agung  
Rensselaer Pol. Inst.  
Drexel Univ.  
Drexel Univ.  
Drexel Univ.  
Rensselaer Pol. Inst.

10:45-11:00  
**WeB06.2**

Marino, Hamal  
Bergeles, Christos  
Nelson, Bradley J.  
Scuola Superiore Sant'Anna  
ETH Zurich  
ETH Zurich

11:00-11:15  
**WeB06.3**

Khorami Llewellyn, Maral  
Dario, Paolo  
Menciassi, Arianna  
Sinibaldi, Edoardo  
Scuola Superiore Sant'Anna, Piazza Martiri della Libertà, Pisa (I)  
Scuola Superiore Sant'Anna  
Scuola Superiore Sant'Anna - SSSA  
Istituto Italiano di Tecnologia

11:15-11:30  
**WeB06.4**

Ma, Zhijiang  
Akella, Srinivas  
UNC Charlotte  
Univ. of North Carolina at Charlotte

11:30-11:45  
**WeB06.5**

Hagiwara, Masaya  
Kawahara, Tomohiro  
iijima, Toru  
Arai, Fumihito  
Nagoya Univ.  
Kyushu Inst. of Tech.  
Muroran Inst. Tech.  
Nagoya Univ.

11:45-12:00  
**WeB06.6**

**Mobility and Kinematic Analysis of a Novel Dexterous Micro Gripper**, pp. 2523-2528.
Xiao, Shunli  
Li, Yangmin  
Univ. of Macau  
Univ. of Macau

**WeB07**  
**Sampling-Based Motion Planning (Regular Session)**  
Meeting Room 7 (Remnicha)

Chair: Amato, Nancy  
Co-Chair: Bretl, Timothy  
Texas A&M Univ.  
Univ. of Illinois at Urbana-Champaign

10:30-10:45  
**WeB07.1**
A Scalable Method for Parallelizing Sampling-Based Motion Planning Algorithms, pp. 2529-2536.

Jacobs, Sam Ade Texas A&M Univ.
Manavi, Kasra Texas A & M Univ.
Burgos, Juan Texas A & M Univ.
Denny, Jory Texas A&M Univ.
Thomas, Shawna Texas A&M Univ.
Amato, Nancy Texas A&M Univ.

10:45-11:00 WeB07.2
LQR-RRT*: Optimal Sampling-Based Motion Planning with Automatically Derived Extension Heuristics, pp. 2537-2542.

Perez, Alejandro MIT
Platt, Robert MIT
Konidaris, George Dimitri MIT
Kaelbling, Leslie MIT
Lozano-Perez, Tomas MIT

11:00-11:15 WeB07.3
SR-RRT: Selective Retraction-Based RRT Planner, pp. 2543-2550. Attachment

Lee, Junghwan KAIST
Kwon, Osung KAIST
Zhang, Liangjun Stanford Univ.
Yoon, Sung-eui KAIST

11:15-11:30 WeB07.4
Sampling-Based Motion Planning with Dynamic Intermediate State Objectives: Application to Throwing, pp. 2551-2556. Attachment

Zhang, Yajia Indiana Univ. Bloomington
Luo, Jingru Indiana Univ. Bloomington
Hauser, Kris Indiana Univ.

11:30-11:45 WeB07.5
Towards Small Asymptotically Near-Optimal Roadmaps, pp. 2557-2562.

Marble, James Univ. of Nevada Reno
Bekris, Kostas E. Univ. of Nevada Reno

11:45-12:00 WeB07.6
Proving Path Non-Existence Using Sampling and Alpha Shapes, pp. 2563-2569. Attachment

McCarthy, Zoe Univ. of Illinois at Urbana-Champaign
Bretl, Timothy Univ. of Illinois at Urbana-Champaign
Hutchinson, Seth Univ. of Illinois

WeB08 Meeting Room 8 (Wacipi)
Parts Handling and Manipulation (Regular Session)

Chair: Schimmels, Joseph Marquette Univ.
Co-Chair: Kim, ChangHwan Korea Inst. of Science and Tech.

10:30-10:45 WeB08.1
Design of Parts Handling and Gear Assembling Device, pp. 2570-2577. Attachment

Yamaguchi, Kengo Tohoku Univ.
Hirata, Yasuhiisa Tohoku Univ.
Kaisumi, Aya Tohoku Univ.
Kosuge, Kazuhiro Tohoku Univ.

10:45-11:00 WeB08.2

Wiener, Steven Quarles & Brady LLP
Schimmels, Joseph Marquette Univ.

11:00-11:15 WeB08.3
The Effect of Anisotropic Friction on Vibratory Velocity Fields, pp. 2584-2591. Attachment

Umbanhowar, Paul Northwestern Univ.
11:15-11:30  WeB08.4
Sparse Spatial Coding: A Novel Approach for Efficient and Accurate Object Recognition, pp. 2592-2598.

Leivas, Gabriel  
Nascimento, Erickson  
Wilson Vieira, Antonio  
Campos, Mario Montenegro  
Univ. Federal de Minas Gerais  
Univ. Federal de Minas Gerais (UFMG)  
Univ. Federal de Minas Gerais

11:30-11:45  WeB08.5
Humanoid’s Dual Arm Object Manipulation Based on Virtual Dynamics Model, pp. 2599-2604.

Shin, Sung Yul  
Lee, Jun won  
Kim, Chang Hwan  
Korea Inst. of Science and Tech.  
KIST

11:45-12:00  WeB08.6
A Kernel-Based Approach to Direct Action Perception, pp. 2605-2610.

Kroemer, Oliver  
Ugur, Emre  
Oztop, Erhan  
Peters, Jan  
Max-Planck Inst. for Biological Cybernetics  
National Inst. of Information and Communications Tech.  
Ozyegin Univ.  
Tech. Univ. Darmstadt

10:30-10:45  WeB09.1
Road Vehicle Localization with 2D Push-Broom Lidar and 3D Priors, pp. 2611-2617.

Baldwin, Ian Alan  
Newman, Paul  
Oxford  
Oxford Univ.

10:45-11:00  WeB09.2

Vivet, Damien  
Checchin, Paul  
Chapuis, Roland  
Lasmea - Blaise Pascal Univ.  
LASMEA  
LASMEA/FR-TIMS

11:00-11:15  WeB09.3

Stewart, Alex  
Newman, Paul  
Oxford Univ.  
Oxford Univ.

11:15-11:30  WeB09.4

Smith, Aaron  
Chang, H. Jacky  
Blanchard, Edward  
Precise Path Robotics  
Precise Path Robotics Inc.  
Precise Path Robotics

11:30-11:45  WeB09.5
Curb-Intersection Feature Based Monte Carlo Localization on Urban Roads, pp. 2640-2646.

Qin, Baoxing  
Chong, Zhuang Jie  
Bandyopadhyay, Tirthankar  
Ang Jr, Marcelo H  
Frazzoli, Emilio  
Rus, Daniela  
NUS  
NUS  
Singapore MIT Alliance for R & T  
National Univ. of Singapore  
Massachusetts Inst. of Tech.  
MIT
### WeB10
#### Interactive Session WeB-1 (Interactive Session)

| Chair: Roumeliotis, Stergios | Univ. of Minnesota |
| Co-Chair: Song, Jae-Bok | Korea Univ. |

#### 10:30-11:00

| ModelRob: A Simulink Library for Model-Based Development of Robot Manipulators, pp. 2654-2659. | Unv. of California, Los Angeles |
| Saha, Indranil | SRI International |
| Shankar, Natarajan | |

| Resonant Wireless Power Transfer to Ground Sensors from a UAV, pp. 2660-2665. | Univ. of Nebraksa-Lincoln |
| Griffin, Brent Austin | |
| Detweiler, Carrick | |

#### 10:30-11:00

| Implementing a Variable Impedance Actuator, pp. 2666-2672. | Faculty of Engineering - Univ. of Pisa |
| Catalano, Manuel | Univ. di Pisa |
| Grioli, Giorgio | Univ. di Pisa |
| Garabini, Manolo | Univ. of Pisa |
| Belo, Felipe | Istituto Italiano di Tecnologia |
| Di Basco, Andrea | Univ. of Pisa |
| Tzagarakis, Nikolaos | |
| Bicchi, Antonio | Univ. of Pisa |

#### 10:30-11:00

| A Study on Sinus-Lifting Motion of a Snake Robot with Energetic Efficiency, pp. 2673-2678. | Kyoto Univ. |
| Toyoshima, Satoshi | |
| Matsuno, Fumitoshi | |

#### 10:30-11:00

| Dogramadzi, Sanja | |
| Dogramadzi, Sanja | |

### WeB20
#### Interactive Session WeB-2 (Interactive Session)

| Chair: Roumeliotis, Stergios | Univ. of Minnesota |
| Co-Chair: Song, Jae-Bok | Korea Univ. |

#### 11:00-11:30

| Lee, Sang-Duck | |
| Kim, Byeong-Sang | |
| Song, Jae-Bok | |

#### 11:00-11:30

| Trajectory Generation for Swing-Free Maneuvers of a Quadrotor with Suspended Payload: A Dynamic Programming Approach, pp. 2691-2697. | Univ. of New Mexico |
| Palunko, Ivana | Université de Montréal |
| Fierro, Rafael | Université de Montréal |
| Cruz, Patricio | Université de Montréal |

#### 11:00-11:30

| Adaptive Modeling of a Fully Hysteretic Magneto-Rheological Clutch, pp. 2698-2703. | The Univ. of Western Ontario |
| Yadmellat, Peyman | |
M3Express: A Low-Cost Independently-Mobile Reconfigurable Modular Robot, pp. 2704-2710.
Wolfe, Kevin Johns Hopkins Univ.
Moses, Matthew S Johns Hopkins Univ.
Kutzer, Michael Dennis Mays Johns Hopkins Univ. Applied Physics Lab.
Chirikjian, Gregory Johns Hopkins Univ.

Kiguchi, Kazuo Saga Univ.
Hayashi, Yoshiaki Saga Univ.

Interactive Session WeB-3 (Interactive Session)
Chair: Roumeliotis, Stergios Univ. of Minnesota
Co-Chair: Song, Jae-Bok Korea Univ.

Park, Young Jin POSTECH
Lee, Hosun Korea Inst. of Science and Tech.
Oh, Yonghwan KIST
Chung, Wan Kyun POSTECH

Guaranteed Safe Online Learning Via Reachability: Tracking a Ground Target Using a Quadrotor, pp. 2723-2730. Attachment
Gillula, Jeremy Stanford Univ.
Tomlin, Claire UC Berkeley

SMD Pluggable Tactile Display Driven by Soft Actuator, pp. 2731-2736.
Lee, HyungSeok Sungkyunkwan Univ.
Kwon, Hyeokyoung Sungkyunkwan Univ.
Kim, Daegyeong Sungkyunkwan Univ.
Kim, Ukyum Sungkyunkwan Univ.
Linh, Nguyenngoc Sungkyunkwan Univ.
Toan, Nguyencanh Sungkyunkwan Univ.
Moon, Hyungpil Sungkyunkwan Univ.
Koo, Ja Choon Sungkyunkwan Univ.
Nam, Jaedo Sungkyunkwan Univ.
Choi, Hyouk Ryeol Sungkyunkwan Univ.

Combot: Compliant Climbing Robotic Platform with Transitioning Capability and Payload Capacity, pp. 2737-2742. Attachment
Lee, Giuk Seoul National Univ.
Wu, Geeyun Seoul National Univ.
Kim, Sun Ho Seoul National Univ.
Kim, Jongwon Seoul National Univ.
Seo, TaeWon Yeungnam Univ.

Strength Testing Machines for Wearable Walking Assistant Robots Based on Risk Assessment of Robot Suit HAL, pp. 2743-2748.
Nabeshima, Cota CYBERDYNE Inc.
Kawamoto, Hiroaki Univ. of Tsukuba
Sankai, Yoshiyuki Univ. of Tsukuba
Micro/Nanoscale Automation II (Regular Session)

Chair: Gupta, Satyandra K.  
Co-Chair: Fukuda, Toshio

14:30-14:45  WeC01.1

Gripper Synthesis for Indirect Manipulation of Cells Using Holographic Optical Tweezers, pp. 2749-2754. Attachment
Chowdhury, Sagar  
Svec, Petr  
Wang, Chenlu  
Losert, Wolfgang  
Gupta, Satyandra K.

14:45-15:00  WeC01.2

Robotic Pick-Place of Nanowires for Electromechanical Characterization, pp. 2755-2760.
Ye, Xutao  
Zhang, Yong  
Sun, Yu

15:00-15:15  WeC01.3

Xu, Zhonghua  
Lenaghan, Scott  
Gilmore, David  
Xia, Lijin  
Zhang, Mingjun

15:15-15:30  WeC01.4

Non-Vector Space Control for Nanomanipulations Based on Compressive Feedbacks, pp. 2767-2772.
Song, Bo  
Zhao, Jianguo  
Xi, Ning  
Lai, King Wai Chiu  
Yang, Ruiguo  
Qu, Chengeng  
Chen, Hongzhi

15:30-15:45  WeC01.5

Nanotool Exchanger System Based on E-SEM Nanorobotic Manipulation System, pp. 2773-2778.
Nakajima, Masahiro  
Kawamoto, Takuya  
Hirano, Takahiro  
Kojima, Masaru  
Fukuda, Toshio

15:45-16:00  WeC01.6

Controlled Positioning of Biological Cells Inside a Micropipette, pp. 2779-2784. Attachment
Zhang, Xuping  
Leung, Clement  
Lu, Zhe  
Esfandiari, Navid  
Casper, Robert  
Sun, Yu

WeC02

Compliance Devices and Control (Regular Session)

Chair: Tsagarakis, Nikolaos  
Co-Chair: Caldwell, Darwin G.

14:30-14:45  WeC02.1


Hammond III, Frank L. Harvard Univ.
Weisz, Jonathan Columbia Univ.
de la Llera Kurth, Andres Harvard Univ.
Allen, Peter Columbia Univ.
Howe, Robert D. Harvard Univ.

Seashell Effect Pretouch Sensing for Robotic Grasping, pp. 2851-2858. Attachment
Jiang, Liang-Ting Univ. of Washington
Smith, Joshua R. Univ. of Washington

Position Control of Tendon-Driven Fingers with Position Controlled Actuators, pp. 2859-2864.
Abdallah, Muhammad General Motors R&D
Platt, Robert MIT
Hargrave, Brian Oceaneering Space Systems
Permenter, Frank Oceaneering Space Systems

Stochastic Motion Planning (Regular Session)
Chair: Frazzoli, Emilio Massachusetts Inst. of Tech.
Co-Chair: Laugier, Christian INRIA Rhône-Alpes

An Incremental Sampling-Based Algorithm for Stochastic Optimal Control, pp. 2865-2872.
Huynh, Vu Anh MIT
Karaman, Sertac Massachusetts Inst. of Tech.
Frazzoli, Emilio Massachusetts Inst. of Tech.

Stochastic Distributed Multi-Agent Planning and Applications to Traffic, pp. 2873-2879.
Lim, Sejoon MIT
Rus, Daniela MIT

Rios-Martinez, Jorge INRIA Rhone-Alpes
Renzaglia, Alessandro INRIA
Spalanzani, Anne INRIA / UPMF-Grenoble 2
Martinelli, Agostino INRIA Grenoble-Rhone-Alpes
Laugier, Christian INRIA Rhône-Alpes

Probabilistic Path Planning for Multiple Robots with Subdimensional Expansion, pp. 2886-2892. Attachment
Wagner, Glenn Carnegie Mellon
Kang, Minsu Seoul National Univ.
Choset, Howie Carnegie Mellon Univ.

Shah, Shridhar Univ. of Delaware
Pahilajani, Chetan Univ. of Delaware
Lacock, Nicholas Univ. of Delaware
Tanner, Herbert G. Univ. of Delaware

High-Speed Flight in an Ergodic Forest, pp. 2899-2906.
Karaman, Sertac Massachusetts Inst. of Tech.
WeC05
Image-Guided Interventions (Regular Session)  
Meeting Room 5 (Ska)

Chair: Dupont, Pierre  
Co-Chair: Hager, Gregory

14:30-14:45  
Tubular Enhanced Geodesic Active Contours for Continuum Robot Detection Using 3D Ultrasound, pp. 2907-2912.  
Ren, Hongliang  
Dupont, Pierre

14:45-15:00  
Ultrasound and Optically Controlled Robotic Instrument for Resternotomy in Cardiothoracic Surgery, pp. 2913-2918.  
Korff, Alexander  
Jansen, Arne  
Kunze, Sandra  
Jalowy, Thomas  
Kunze, Sandra  
Dohmen, Guido  
Heger, Stefan  
Kunze, Sandra  
Radermacher, Klaus

15:00-15:15  
Full State Visual Forceps Tracking under a Microscope Using Projective Contour Models, pp. 2919-2925. Attachment  
Baek, Young Min  
Tanaka, Shinichi  
Harada, Kanako  
Sugita, Naohiko  
Morita, Akio  
Sora, Shigeo  
Mochizuki, Ryo  
Mitsuishi, Mamoru

15:15-15:30  
Castro, Cristian  
Smith, Sara  
Alqassis, Adham  
Ketterl, Thomas  
Sun, Yu  
Ross, Sharon  
Rosemurgy, Alexander  
Savage, Peter  
Gitlin, Richard

15:30-15:45  
Motion Planning for the Virtual Bronchoscopy, pp. 2932-2937. Attachment  
Rosell, Jan  
Pérez, Alexander  
Cabras, Paolo  
Rosell, Antoni

15:45-16:00  
Pose Reconstruction of Flexible Instruments from Endoscopic Images Using Markers, pp. 2938-2943. Attachment  
Reilink, Rob  
Stramigioli, Stefano  
Misra, Sarthak
### Mobile Manipulation: Planning & Control (Regular Session)

**Chair:** Lozano-Perez, Tomas  
**Co-Chair:** Ryu, Jeha  

**14:30-14:45**  
**Planning with Adaptive Dimensionality for Mobile Manipulation**, pp. 2944-2951. [Attachment](#)  
**Gochev, Kalin**  
**Safonova, Alla**  
**Likhachev, Maxim**

**14:45-15:00**  
**Unifying Perception, Estimation and Action for Mobile Manipulation Via Belief Space Planning**, pp. 2952-2959.  
**Kaelbling, Leslie**  
**Lozano-Perez, Tomas**

**15:00-15:15**  
**Distributed Cooperative Object Attitude Manipulation**, pp. 2960-2965.  
**Markdahl, Johan**  
**Karayiannidis, Yiannis**  
**Hu, Xiaoming**  
**Kragic, Danica**

**15:15-15:30**  
**Petrov, Plamen**  
**Boussard, Clément**  
**Ammoun, Samer**  
**Nashashibi, Fawzi**

**15:30-15:45**  
**Convex Hull-Based Power Manipulability Analysis of Robot Manipulators**, pp. 2972-2977.  
**Choi, Hee-Byoung**  
**Ryu, Jeha**

**15:45-16:00**  
**On Continuous Null Space Projections for Torque-Based, Hierarchical, Multi-Objective Manipulation**, pp. 2978-2985. [Attachment](#)  
**Dietrich, Alexander**  
**Albu-Schäffer, Alin**  
**Hirzinger, Gerd**

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### Environment Mapping (Regular Session)

**Chair:** Choi, Jongsuk  
**Co-Chair:** Tomono, Masahiro

**14:30-14:45**  
**Schneider, Sven**  
**Meikumyan, Arman**  
**Murphy, Richard**  
**Nettleton, Eric**

**14:45-15:00**  
**A Dependable Perception-Decision-Execution Cycle for Autonomous Robots**, pp. 2992-2998. [Attachment](#)  
**Gspandl, Stephan**  
**Podesser, Siegfried**  
**Reip, Michael**  
**Steinbauer, Gerald**  
**Wolfram, Máté**

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**Chair:** Choi, Jongsuk  
**Co-Chair:** Tomono, Masahiro  

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**Chair:** Lozano-Perez, Tomas  
**Co-Chair:** Ryu, Jeha  

**14:30-14:45**  
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**Likhachev, Maxim**

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**Hirzinger, Gerd**

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**Chair:** Choi, Jongsuk  
**Co-Chair:** Tomono, Masahiro  

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**Schneider, Sven**  
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**Murphy, Richard**  
**Nettleton, Eric**

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**Podesser, Siegfried**  
**Reip, Michael**  
**Steinbauer, Gerald**  
**Wolfram, Máté**

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**Chair:** Lozano-Perez, Tomas  
**Co-Chair:** Ryu, Jeha  

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**Likhachev, Maxim**

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**Dietrich, Alexander**  
**Albu-Schäffer, Alin**  
**Hirzinger, Gerd**
<table>
<thead>
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<tr>
<td>15:00-15:15</td>
<td>WeC07.3</td>
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| Efficient Change Detection in 3D Environment for Autonomous Surveillance Robots Based on Implicit Volume, pp. 2999-3004. | Wilson Vieira, Antonio  
Univ. Federal de Minas Gerais  
Drews Jr, Paulo  
Federal Univ. of Rio Grande (FURG)  
Campos, Mario Montenegro  
Univ. Federal de Minas Gerais |
| 15:15-15:30  | WeC07.4   |
| Image-Based Planar Reconstruction for Dense Robotic Mapping, pp. 3005-3012. | Tomono, Masahiro  
Chiba Inst. of Tech. |
| 15:30-15:45  | WeC07.5   |
| Stochastic Source Seeking in Complex Environments, pp. 3013-3018. Attachment | Atanasov, Nikolay  
Le Ny, Jerome  
Michael, Nathan  
Pappas, George J.  
Univ. of Pennsylvania |
| 15:45-16:00  | WeC07.6   |
| Robust Sound Localization for Various Platform of Robots Using TDOA Map Adaptation, pp. 3019-3024. | Shen, Guanghu, Guanghu  
Hwang, Dohyung  
Nguyen, Quang  
Choi, Jongsuk  
KIST, Biomedical Res. Inst.  
Korea Inst. of Science and Tech.  
Korea Inst. of Sci. and Tech. |
| 14:30-14:45  | WeC08.1   |
| Efficient Data-Driven MCMC Sampling for Vision-Based 6D SLAM, pp. 3025-3032. | Min, Jihong  
Kim, Jungho  
Shin, Seunghak  
Kweon, In So  
KAIST  
KAIST  
KAIST  
KAIST |
| 14:45-15:00  | WeC08.2   |
| Scan Segments Matching for Pairwise 3D Alignment, pp. 3033-3040. | Douillard, Bertrand  
Quadros, Alastair James  
Morton, Peter  
Underwood, James Patrick  
De Deuge, Mark  
Hugosson, Simon  
Hallström, Manfred  
Bailey, Tim  
Univ. of Sydney  
The Univ. of Sydney  
Univ. of Sydney  
The Univ. of Sydney  
The Univ. of Sydney  
Linköping Univ.  
Linköping Univ.  
Univ. of Sydney |
| 15:00-15:15  | WeC08.3   |
| Planar Surface SLAM with 3D and 2D Sensors, pp. 3041-3048. | Trevor, Alexander J B  
Rogers III, John G.  
Christensen, Henrik Iskov  
Georgia Inst. of Tech.  
Georgia Inst. of Tech.  
Georgia Inst. of Tech. |
| 15:15-15:30  | WeC08.4   |
| Uncertainty Estimation for a 6-DoF Spectral Registration Method As Basis for Sonar-Based Underwater 3D SLAM, pp. 3049-3054. | Pfingsthorn, Max  
Birk, Andreas  
Buelow, Heiko  
Jacobs Univ.  
Jacobs Univ.  
Jacobs Univ. |
| 15:30-15:45  | WeC08.5   |
Interactive Acquisition of Residential Floor Plans, pp. 3055-3062. Attachment

Kim, Young Min  Stanford Univ.
Dolson, Jennifer  Stanford Univ.
Sokolsky, Michael  Stanford Univ.
Koltun, Vladlen  Stanford Univ.
Thrun, Sebastian  Stanford Univ.

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CFastSLAM: A New Jacobian Free Solution to SLAM Problem, pp. 3063-3068.

Song, Yu  Beijing Jiaotong Univ.
Li, Qingling  China Univ. of Mining & Tech.
Kang, Yifei  Beijing Jiaotong Univ.
Song, Yongduan  Beijing Jiaotong Univ.

WeC09

Visual Tracking (Regular Session)

Chair: Maye, Jerome  ETH Zurich
Co-Chair: Hadj-Abdelkader, Hicham  IBISC

14:30-14:45  WeC09.1

Generic Realtime Kernel Based Tracking, pp. 3069-3074. Attachment

Hadj-Abdelkader, Hicham  IBISC
Mezouar, Youcef  Blaise Pascal Univ.
Chateau, Thierry  Blaise Pascal Univ.

14:45-15:00  WeC09.2

Generative Object Detection and Tracking in 3D Range Data, pp. 3075-3081.

Kaestner, Ralf  ETH Zurich
Maye, Jerome  ETH Zurich
Pilat, Yves  ETH Zurich
Siegwart, Roland  ETH Zurich

15:00-15:15  WeC09.3

Moving Vehicle Detection and Tracking in Unstructured Environments, pp. 3082-3087. Attachment

Wojke, Nicolai  Univ. of Koblenz-Landau
Häselich, Marcel  Univ. of Koblenz-Landau

15:15-15:30  WeC09.4

Learning to Place New Objects, pp. 3088-3095. Attachment

Jiang, Yun  Cornell Univ.
Zheng, Changxi  Cornell Univ.
Lim, Marcus  Cornell Univ.
Saxena, Ashutosh  Cornell Univ.

15:30-15:45  WeC09.5

Lost in Translation (and Rotation): Rapid Extrinsic Calibration for 2D and 3D LIDARs, pp. 3096-3102. Attachment

Maddern, William  Queensland Univ. of Tech.
Harrison, Alastair  Univ. of Oxford
Newman, Paul  Oxford Univ.

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Automatic and Self-Contained Calibration of a Multi-Sensorial Humanoid's Upper Body, pp. 3103-3108. Attachment

Birbach, Oliver  DFKI
Bäuml, Berthold  German Aerospace Center (DLR)
Frese, Udo  Univ. of Bremen

WeC110

Interactive Session WeC-1 (Interactive Session)

Chair: Lee, C. S. George  Purdue Univ.
Co-Chair: Han, Chang-Soo  Hanyang Univ.
14:30-15:00 WeC110.1
A Three-Link Module for Modular Dynamics and Control of High-Dimensional Humanoids, pp. 3109-3115.
Hemami, Hooshang
Zheng, Yuan F.
The Ohio State Univ.

14:30-15:00 WeC110.2
Kinetic Scrolling-Based Position Mapping for Haptic Teleoperation of Unmanned Aerial Vehicles, pp. 3116-3121.
Mersha, Abeje Y.
Rüesch, Andreas
Stramigioli, Stefano
Carloni, Raffaella
Univ. of Twente
ETHZ
Univ. of Twente
Univ. of Twente

14:30-15:00 WeC110.3
A Bio-Inspired Compliant Parallel Mechanism for High-Precision Robots, pp. 3122-3127.
Kozuka, Hiroaki
Arata, Jumpei
Okuda, Kenji
Onaga, Akinori
Ohno, Motoshi
Sano, Akihito
Fujimoto, Hideo
Nagoya Inst. of Tech.
Nagoya Inst. of Tech.
Brother Industries, Ltd.
Brother Industries, Ltd.
Brother Industries, Ltd.
Nagoya Inst. of Tech.

14:30-15:00 WeC110.4
Analysis Framework for Cooperating Mobile Cable Robots, pp. 3128-3133.
Zhou, Xiaobo
Tang, Chinpei
Krovi, Venkat
SUNY at Buffalo
Caterpillar Inc.
Univ. at Buffalo (SUNY)

14:30-15:00 WeC110.5
Understanding and Reproducing Waltz Dancers’ Body Dynamics in Physical Human-Robot Interaction, pp. 3134-3140.
Wang, Hongbo
Kosuge, Kazuhiro
Tohoku Univ.
Tohoku Univ.

15:00-15:30 WeC210.1
Xu, Chunquan
Ming, Aiguo
Shimojo, Makoto
The Univ. of Electro-Communications
The Univ. of Electro-Communications
Univ. of Electro-Communications

15:00-15:30 WeC210.2
Mechanical Design of a Manipulation System for Unmanned Aerial Vehicles, pp. 3147-3152.
Keemink, Arvid Q.L.
Fumagalli, Matteo
Stramigioli, Stefano
Carloni, Raffaella
Univ. of Twente
Univ. of Twente
Univ. of Twente
Univ. of Twente

15:00-15:30 WeC210.3
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Nakata, Yoshihiro
Ide, Atsuhiro
Nakamura, Yutaka
Hirata, Katsuhiko
Ishiguro, Hiroshi
Osaka Univ.
Osaka Univ.
Osaka Univ.
Osaka Univ.
Osaka Univ.

15:00-15:30 WeC210.4
Modeling Human Motion Patterns for Multi-Robot Planning, pp. 3161-3166.

Karnad, Nikhil, Univ. of Minnesota, Twin-Cities
Isler, Volkan, Univ. of Minnesota


Lee, HanJin, KIST
Kim, Keehoon, Korea Inst. of Science and Tech.
Park, Myoung Soo, Korea Inst. of Science and Tech.
Park, Jong Hyeon, Hanyang Univ.
Oh, Sang-Rok, KIST

**Improving Endurance of Autonomous Aerial Vehicles through Intelligent Service-Station Placement**, pp. 3179-3184.

Byeong-kyu, Lee, Hanyang Univ.
Hee-Don, Lee, Hanyang Univ.
Lee, Ji-Yeong, Hanyang Univ.
Shin, Kyosokik, Hanyang Univ.
Han, Jungsoo, Hansung Univ.
Han, Chang-Soo, Hanyang Univ.


Ikemoto, Shuhei, Graduate School of Information Science and Tech.
Nishigori, Yoichi, Osaka Univ.
Hosoda, Koh, Osaka Univ.

**A Sampling-Based Approach to Probabilistic Pursuit Evasion**, pp. 3192-3199.

Mahadevan, Aditya, Texas A&M Univ.
Amato, Nancy, Texas A&M Univ.


Pitzer, Benjamin, Robert Bosch LLC
Osentoski, Sarah, Robert Bosch LLC
Jay, Graylin, Brown Univ.
Crick, Christopher, Brown Univ.
Jenkins, Odest Chadwicke, Brown Univ.


Karydis, Konstantinos, Univ. of Delaware
Valbuena, Luis, Univ. of Delaware
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Regularity Properties and Deformation of Wheeled Robots Trajectories, pp. 3212-3217.

Pham, Quang-Cuong
Nakamura, Yoshihiko

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A Homicidal Differential Drive Robot, pp. 3218-3225.

Ruiz, Ubaldo
Murrieta-Cid, Rafael

WeD01.4


Svinin, Mikhail
Morinaga, Akihiro
Yamamoto, Motoji

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Ruggiero, Fabio
Lynch, Kevin

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van den Berg, Jur
Alterovitz, Ron

WeD02

Meeting Room 2 (Chief Red Wing)

Grasping and Manipulation (Regular Session)

Chair: Moon, Hyungpil
Co-Chair: Beetz, Michael

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Movement-Aware Action Control - Integrating Symbolic and Control-Theoretic Action Execution, pp. 3245-3251.

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Beetz, Michael

WeD02.2

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Tahara, Kenji
Maruta, Keigo
Kawamura, Akihiro
Yamamoto, Motoji

WeD02.3


Kim, Junggon
Iwamoto, Kunihiro
Kuffner, James
Ota, Yasuhiro
Pollard, Nancy S

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Carpin, Stefano

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<td>Rubenstein, Michael (Harvard Univ.), Ahler, Christian (Harvard Univ.), Nagpal, Radhika (Harvard Univ.)</td>
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<td>An, Byoungkwon (MIT, CSAIL), Rus, Daniela (MIT)</td>
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<td>Zhang, Yu (Tony) (Univ. of Tennessee), Parker, Lynne (Univ. of Tennessee)</td>
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Garabini, Manolo  
Bonomo, Fabio  
Bicchi, Antonio

Mancini, Michele  
Grioli, Giorgio  
Catalano, Manuel  
Garabini, Manolo  
Bonomo, Fabio  
Bicchi, Antonio

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Belo, Felipe  
Salans, Paolo  
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Bicchi, Antonio

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Stramigioli, Stefano  
Carloni, Raffaella

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Tagliamonte, Nevio Luigi  
Carpino, Giorgio  
Sergi, Fabrizio  
Di Palo, Michelangelo  
Guglielmelli, Eugenio

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Chair: Balakirsky, Stephen
Co-Chair: Gorman, Jason
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Abbeel, Pieter

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Ichim, Alexandru-Eugen
Birk, Andreas

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Girdhar, Yogesh
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<th>Authors</th>
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<td>Osaka Univ.</td>
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<td>National Inst. of AIST</td>
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<td>Drexel Univ.</td>
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<td>Univ. of Zagreb</td>
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<td>Lockheed Martin Advanced Tech. Lab.</td>
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<td>Tadakuma, Kenjiro, Tadakuma, Riichiro, Ioka, Kyohei, Kudo, Takeshi, Takagi, Minoru, Tsumaki, Yuichi, Higashimori, Mitsuru, Kaneko, Makoto</td>
<td>Osaka Univ.</td>
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<td>Case Western Res. Univ.</td>
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Hak, Sovannara
Mansard, Nicolas
Ramos, Oscar E.
Saab, Layale
Stasse, Olivier
LAAS-CNRS, INSA Toulouse
CNRS
LAAS-CNRS
CNRS

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Steager, Edward
Sakar, Mahmut Selman
Magee, Ceridwen
Kennedy III, Monroe
Cowley, Anthony
Kumar, Vijay
Univ. of Pennsylvania
Massachusetts Inst. of Tech.
Univ. of Pennsylvania
Univ. of Maryland Baltimore County
Univ. of Pennsylvania
Univ. of Pennsylvania

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Cornell Univ.
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Cornell Univ.
Cornell Univ.

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Basu, Gaurab
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Saxena, Ashutosh
IIT Kharagpur
Cornell Univ.
Cornell Univ.

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Frost, Matthew
King, Jonathan
Thatte, Nitish
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NASA Jet Propulsion Lab.
The Ohio State Univ.
Rutgers Univ.

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Perzylo, Alexander Clifford
Waibel, Markus
van de Molengraft, Marinus Jacobus Gerardus
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Univ. of Stuttgart
Univ. of Stuttgart
Univ. of Stuttgart
TU München
I3A. Univ. de Zaragoza
Inst. de Investigación en Ingeniería de Aragón, Univ. o
Univ. de Zaragoza
I3A. Univ. de Zaragoza
Tech. Univ. Muenchen
ETH Zurich
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Ma, Raymond
Dollar, Aaron
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Yale Univ.
Yale Univ.

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Co-Chair: Fierro, Rafael

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Saripalli, Srikanth Arizona State Univ.

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Co-Chair: Fierro, Rafael Univ. of New Mexico

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Rahman, Tauhidur Univ. of Texas at Dallas
Busso, Carlos Univ. of Texas at Dallas
Gans, Nicholas Univ. of Texas at Dallas

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Choi, Jinwoo POSTECH
Nam, Sang Yep Kookje Coll.
Chung, Wan Kyun POSTECH

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Cobano, Jose A. Univ. o Seville
Trujillo, Miguel Angel Center for Advanced Aerospace Tech.
Viguria, Antidio Center for Advanced Aerospace Tech. (CATEC)
Rodriguez Castaño, Angel Univ. of Seville
Ollero, Anibal Univ. of Seville

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Chair: Sugano, Shigeki Waseda Univ.
Co-Chair: Fierro, Rafael Univ. of New Mexico

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**Technical Program for Thursday May 17, 2012**

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Tresch, Matthew Northwestern Univ.
Memberg, William Case Western Res. Univ.
Kirsch, Robert Case Western Res. Univ.
Lynch, Kevin Northwestern Univ.

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Vander Poorten, Emmanuel B
Demeester, Eric
Reekmans, Eli
Philips, Johan
Huntemann, Alexander
De Schutter, Joris

Vander Poorten, Emmanuel B Katholieke Univ. Leuven
Demeester, Eric Katholieke Univ. Leuven
Reekmans, Eli Katholieke Univ. Leuven
Philips, Johan K.U.Leuven
Huntemann, Alexander Katholieke Univ. Leuven
De Schutter, Joris Katholieke Univ. Leuven

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Hirokawa, Masakazu
Uesugi, Naohisa
Furugori, Satoru
Kitagawa, Tomoko
Suzuki, Kenji

Hirokawa, Masakazu Univ. of Tsukuba
Uesugi, Naohisa Mazda Motor Corp.
Furugori, Satoru Mazda Motor Corp.
Kitagawa, Tomoko Mazda Motor Corp.
Suzuki, Kenji Univ. of Tsukuba

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Talasaz, Ali
Patel, Rajnikant V.

Talasaz, Ali Univ. of Western Ontario
Patel, Rajnikant V. The Univ. of Western Ontario

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Nageotte, Florent
Zanne, Philippe
de Mathelin, Michel

Bardou, Berengere Univ. of Strasbourg
Nageotte, Florent Univ. of Strasbourg
Zanne, Philippe Univ. of Strasbourg
de Mathelin, Michel Univ. of Strasbourg

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Co-Chair: Cutkosky, Mark Stanford Univ.

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Kano, Takeshi
Watanabe, Yuki
Ishiguro, Akio

Kano, Takeshi Tohoku Univ.
Watanabe, Yuki Res. Inst. of Electrical Communication, Tohoku Univ.
Ishiguro, Akio Tohoku Univ.

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Nokata, Makoto

Nokata, Makoto Ritsumeikan Univ.

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Dastoor, Sanjay
Cutkosky, Mark

Dastoor, Sanjay Stanford Univ.
Cutkosky, Mark Stanford Univ.

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Tanaka, Hirokazu
Yasuda, Kazuki
Nakamura, Yoshihiko

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Asada, Harry  
Massachusetts Inst. of Tech.  
MIT  
MIT

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Co-Chair: Trinkle, Jeff  
Willow Garage Inc.  
Rensselaer Pol. Inst.

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Univ. of Southern Denmark  
Univ. of Southern Denmark

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Univ. of Hamburg  
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Piatier, Justus  
Kragic, Danica  
Royal Inst. of Tech. (KTH)  
Royal Inst. of Tech.  
Royal Inst. of Tech. (KTH), Sweden  
Univ. of Innsbruck  
KTH

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Baeg, Moon-Hong  
Oh, Sang-Rok  
Korea Inst. of Industrial Tech.  
KITECH, Univ. of Science & Tech.  
KIST  
Korea Inst. of Industrial Tech.  
KIST

Zhang, Li  
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Scuola Superiore Sant'Anna

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Laschi, Cecilia  
Scuola Superiore Sant'Anna  
The BioRobotics Inst. Scuola Superiore Sant'Anna Pisa  
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Tsakiris, Dimitris  
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Foundation for Res. & Tech. - Hellas (FORTH)  
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Inst. of Applied and Computational Mathematics, Foundation f  
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Univ. of Reading  
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Sinibaldi, Edoardo  
Mazzolai, Barbara  
Scuola Superiore Sant'Anna, Italian Inst. of Tech.  
Istituto Italiano di Tecnologia  
Scuola Superiore Sant'Anna, Italian Inst. of Tech.  
Istituto Italiano di Tecnologia  
Istituto Italiano di Tecnologia

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Co-Chair: Sturm, Jürgen  
Katholieke Univ. Leuven  
Tech. Univ. of Munich

Ruehr, Thomas  
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Cremers, Daniel  
Tech. Univ. Muenchen  
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TU München  
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Intel Corp. Intel Science and Tech. Center  
Univ. of Washington  
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Univ. of Southern California  
Univ. of Southern California

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Univ. Laval  
Univ. Laval  
Univ. Laval

Morimoto, Jun  
Noda, Tomoyuki  
Hyon, Sang-Ho  
ATR Computational Neuroscience Lab.  
ATR Computational Neuroscience Lab.  
Ritsumeikan Univ.

Parker, Chris  
Croft, Elizabeth  
Univ. of British Columbia  
Univ. of British Columbia

Xu, Anqi  
Dudek, Gregory  
McGill Univ.  
McGill Univ.

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Univ. of Nebraska, Omaha

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UPMC Pierre and Marie Curie Univ.
CNRS
Univ. Pierre et Marie Curie
Univ. de Franche Comté
Interactive Session ThA-2 (Interactive Session)  
**Chair:** Beard, Randy  
**Co-Chair:** Zheng, Yuan F.  

09:00-09:30  
**ThA210.1**  
*Attachment*  
Meirion-Griffith, Gareth  
Spenko, Matthew  

09:00-09:30  
**ThA210.2**  
Paul, Rohan  
Rus, Daniela  
Newman, Paul  

09:00-09:30  
**ThA210.3**  
Sjöö, Kristoffer  

09:00-09:30  
**ThA210.4**  
*Computing Occupancy Grids from Multiple Sensors Using Linear Opinion Pools*, pp. 4074-4079.  
Adarve, Juan David  
Perrollaz, Mathias  
Makris, Alexandros  
Laugier, Christian  

09:00-09:30  
**ThA210.5**  
*Rotation of Bacteria Sheet Driven Micro Gear in Open Micro Channel*, pp. 4080-4085.  
Miyamoto, Tatsuya  
Kojima, Masaru  
Nakajima, Masahiro  
Homma, Michio  
Fukuda, Toshio  

Interactive Session ThA-3 (Interactive Session)  
**Chair:** Beard, Randy  
**Co-Chair:** Zheng, Yuan F.  

09:30-10:00  
**ThA310.1**  
*A Car Transportation System Grasping Two Drive Wheels*, pp. 4086-4091.  
Yonezawa, Naoaki  
Kashiwazaki, Koshi  
Kosuge, Kazuhiro  
Hirata, Yasuhisa  
Sugahara, Yusuke  
Endo, Mitsuru  
Kanbayashi, Takashi  
Suzuki, Kouki  
Murakami, Kazunori  
Nakamura, Kenichi  

09:30-10:00  
**ThA310.2**  
*Motion Segmentation of Multiple Objects from a Freely Moving Monocular Camera*, pp. 4092-4099.  
Namdev, Rahul Kumar  
Kundu, Abhijit  
Krishna, Madhava  
Jawahar, C.V.  

Ballroom D
09:30-10:00 ThA310.3


Huang, Han-Pang
National Taiwan Univ.

Wu, Po-Wei
Mechanical Engineering Department, National TaiwanUniversity

09:30-10:00 ThA310.4


Al Azrai, Rami
Purdue Univ.

Lee, C. S. George
Purdue Univ.

09:30-10:00 ThA310.5

On-Chip Manipulation and Sensing of Microorganisms by Magnetically Driven Microtools with a Force Sensing Structure, pp. 4112-4117. Attachment

Kawahara, Tomohiro
Kyushu Inst. of Tech.

Sugita, Masakuni
Nagoya Univ.

Hagiwara, Masaya
Nagoya Univ.

Yamanishi, Yoko
Nagoya Univ.

Arai, Fumihito
Nagoya Univ.

Kawano, Hiroyuki
RIKEN

Shihira-Ishikawa, Ikuko
RIKEN

Miyawaki, Atsushi
RIKEN

ThB01

Meeting Room 1 (Mini-sota)

Mechanism Design of Mobile Robots (Regular Session)

Chair: Choi, Hyouk Ryeol
Sungkyunkwan Univ.

Co-Chair: Youcef-Toumi, Kamal
Massachusetts Inst. of Tech.

10:30-10:45 ThB01.1

Design and Analysis of Novel Friction Controlling Mechanism with Minimal Energy for In-Pipe Robot Applications, pp. 4118-4123.

Choi, Changrak
Massachusetts Inst. of Tech.

Youcef-Toumi, Kamal
Massachusetts Inst. of Tech.

Chatzigeorgiou, Dimitris
Massachusetts Inst. of Tech.

Ben-Mansour, Rached
KFUPM

10:45-11:00 ThB01.2

Developing a Gait Enhancing Mobile Shoe to Alter Over-Ground Walking Coordination, pp. 4124-4129. Attachment

Handzic, Ismet
Univ. of South Florida

Vasudevan, Erin
Moss Rehabilitation Res. Inst.

Reed, Kyle Brandon
Univ. of South Florida

11:00-11:15 ThB01.3


Sensinger, Jonathon
Northwestern Univ.

Lipsey, James
Rehabilitation Inst. of Chicago

11:15-11:30 ThB01.4

Robot Environment for Combat Vehicle Driving Simulation, pp. 4136-4141.

Kamnik, Roman
Univ. of Ljubljana, Faculty of Electrical Engineering

Ambrož, Miha
Univ. of Ljubljana, Faculty of Mechanical Engineering

Kuželički, Jernej
Iskra Avtoelektrika d.d.

Prebil, Ivan
Univ. of Ljubljana, Faculty of Mechanical Engineering

Munih, Marko
Univ. of Ljubljana

11:30-11:45 ThB01.5

Frictional Step Climbing Analysis of Tumbling Locomotion, pp. 4142-4147.

Hemes, Brett
CSE, UMN

Papanikolopoulos, Nikos
Univ. of Minnesota

11:45-12:00 ThB01.6

**ThB02**

**Grasping: Modeling, Analysis and Planning (Regular Session)**

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<td><strong>On the Caging Region of a Third Finger with Object Boundary Clouds and Two Given Contact Positions, pp. 4154-4161.</strong></td>
<td>Wan, Weiwei, Fukui, Rui, Shimosaka, Masamichi, Sato, Tomomasa, Kuniyoshi, Yasuo</td>
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<td>10:45-11:00</td>
<td><strong>Independent Contact Regions Based on a Patch Contact Model, pp. 4162-4169.</strong></td>
<td>Charusta, Krzysztof Andrzej, Krug, Robert, Dimitrov, Dimitar Nikolaev, Iliev, Boyko</td>
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<td>11:00-11:15</td>
<td><strong>A Grasping Force Optimization Algorithm for Dexterous Robotic Hands, pp. 4170-4175.</strong></td>
<td>Lippiello, Vincenzo, Siciliano, Bruno, Villani, Luigi</td>
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<td>11:15-11:30</td>
<td><strong>Local Force Closure, pp. 4176-4182.</strong></td>
<td>Kruger, Heinrich, Rimon, Elon, van der Stappen, Frank</td>
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<td>11:30-11:45</td>
<td><strong>Two-Fingered Caging of Polygons Via Contact-Space Graph Search, pp. 4183-4189.</strong></td>
<td>Allen, Thomas F, Burdick, Joel, Rimon, Elon</td>
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<td>11:45-12:00</td>
<td><strong>Object Categorization and Grasping by Parts from Range Scan Data, pp. 4190-4196.</strong></td>
<td>Aleotti, Jacopo, Lodi Rizzini, Dario, Caselli, Stefano</td>
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**ThB03**

**Biologically Inspired Robotics II (Regular Session)**

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<td><strong>Approximating the Stance Map of the SLIP Runner Based on Perturbation Approach, pp. 4197-4203.</strong></td>
<td>Yu, Haitao, Li, Mantian, Cai, Hegao</td>
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<td>10:45-12:00</td>
<td><strong>Analysis of Dynamics and Planar Motion Strategies of a Swimming Microorganism -- Giardia Lamblia, pp. 4204-4209.</strong></td>
<td>Chen, Jun</td>
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Against the Flow: A Braitenberg Controller for a Fish Robot, pp. 4210-4215. Attachment
Salumae, Taavi
Rano, Inaki
Akanyeti, Otar
Kruusmaa, Maarja

Simplified Motion Modeling for Snake Robots, pp. 4216-4221. Attachment
Enner, Florian
Rollinson, David
Choset, Howie

Conical Sidewinding, pp. 4222-4227.
Gong, Chaohui
Hatton, Ross
Choset, Howie

Altitude Feedback Control of a Flapping-Wing Microrobot Using an On-Board Biologically Inspired Optical Flow Sensor, pp. 4228-4235. Attachment
Duhamel, Pierre-Emile
Perez-Arancibia, Nestor O
Barrows, Geoffrey
Wood, Robert

Low-Cost Collaborative Localization for Large-Scale Multi-Robot Systems, pp. 4236-4241.
Prorok, Amanda
Bahr, Alexander
Martinoli, Alcherio

Robotic Manifold Tracking of Coherent Structures in Flows, pp. 4242-4247. Attachment
Hsieh, M. Ani
Forgoston, Eric
Mather, T, William
Schwartz, Ira

Ensemble Synthesis of Distributed Control and Communication Strategies, pp. 4248-4253.
Mather, T, William
Hsieh, M. Ani

Almost-Uniform Sampling of Rotations for Conformational Searches in Robotics and Structural Biology (I), pp. 4254-4259.
Yan, Yan
Chirikjian, Gregory

Randomly Distributed Delayed Communication and Coherent Swarm Patterns (I), pp. 4260-4265. Attachment
Lindley, Brandon
Mier-Y-Teran-Romero, Luis

Stochastic in Robotics and Biological Systems (Invited Session)
Chair: Hsieh, M. Ani
Co-Chair: Chirikjian, Gregory

Randomly Distributed Delayed Communication and Coherent Swarm Patterns (II), pp. 4275-4280. Attachment
Lindley, Brandon
Mier-Y-Teran-Romero, Luis

Mermoud, Gregory  
Mastrangeli, Massimo  
Upadhay, Utkarsh  
Martinoli, Alcherio

10:30-10:45  
Bilateral Teleoperation of Cooperative Manipulators, pp. 4274-4279.

Aldana, Carlos Iván  
Nuno, Emmanuel  
Basanez, Luis

10:45-11:00  
Direct Force Reflecting Teleoperation with a Flexible Joint Robot, pp. 4280-4287. Attachment

Tobergte, Andreas  
Albu-Schäffer, Alin

11:00-11:15  
Dynamic Scaling Interface for Assisted Teleoperation, pp. 4288-4293. Attachment

Munoz, Luis Miguel  
Casals, Alicia

11:15-11:30  
A Proportional Plus Damping Injection Controller for Teleoperators with Joint Flexibility and Time-Delays, pp. 4294-4299.

Nuno, Emmanuel  
Sarras, Ioannis  
Basanez, Luis  
Kinnaert, Michel

11:30-11:45  
Stability of Position-Based Bilateral Telemanipulation Systems by Damping Injection, pp. 4300-4306.

Franken, Michel  
Misra, Sarthak  
Stramigioli, Stefano

11:45-12:00  
Bilateral Teleoperation of a Group of UAVs with Communication Delays and Switching Topology, pp. 4307-4314. Attachment

Secchi, Cristian  
Franchi, Antonio  
Buelthoff, Heinrich H.  
Robuffo Giordano, Paolo

Development of Linear Inchworm Drive Using Flexible Pneumatic Actuator for Active Scope Camera, pp. 4315-4321.

Wakana, Kazuhito  
Ishikura, Michihisa  
Konyo, Masashi
### ThB06.2

**Robotic Body Extension Based on Hot Melt Adhesives**, pp. 4322-4327. Attachment

- **Tadokoro, Satoshi** Tohoku Univ.
- **Brodbeck, Luzius** Bio-Inspired Robotics Lab. ETH Zurich
- **Wang, Liyu** Bio-Inspired Robotics Lab. ETH Zurich
- **Iida, Fumiya** ETH Zurich

**11:00-11:15**

**Design and Analysis of a Robust, Low-Cost, Highly Articulated Manipulator Enabled by Jamming of Granular Media**, pp. 4328-4333. Attachment

- **Cheng, Nadia** Massachusetts Inst. of Tech.
- **Lobovsky, Maxim** Massachusetts Inst. of Tech.
- **Keating, Steven** Massachusetts Inst. of Tech.
- **Setapen, Adam** MIT Media Lab.
- **Gero, Katy Ilonka** MIT
- **Hosoi, Anette** MIT
- **Iagnemma, Karl** MIT

**11:15-11:30**

**Path Planning for Belt Object Manipulation**, pp. 4334-4339.

- **Wakamatsu, Hidefumi** Grad. School of Eng., Osaka Univ.
- **Morinaga, Eiji** Osaka Univ.
- **Arai, Eiji** Graduate School of Eng., Osaka Univ.
- **Hirai, Shinichi** Ritsumeikan Univ.

**11:30-11:45**

**Exact and Efficient Collision Detection for a Multi-Section Continuum Manipulator**, pp. 4340-4346.

- **Li, Jinglin** Univ. of North Carolina - Charlotte
- **Xiao, Jing** UNC-Charlotte

**11:45-12:00**


- **Wright, III, Cornell** Carnegie Mellon Univ.
- **Buchan, Austin D** UC Berkeley
- **Brown, H. Ben** Carnegie Mellon Univ.
- **Geist, Jason C.** Carnegie-Mellon Univ.
- **Schwerin, Michael** Carnegie-Mellon Univ.
- **Rollinson, David** Carnegie Mellon Univ.
- **Tesch, Matthew** Carnegie Mellon Univ.
- **Choset, Howie** Carnegie Mellon Univ.

### ThB07

#### AI Reasoning Methods (Regular Session)

**Meeting Room 7 (Remnicha)**

- **Chair**: v. Wichert, Georg Siemens AG
- **Co-Chair**: Joshi, Saket Oregon State Univ.

**10:30-10:45**


- **Wang, Yali** Laval Univ.
- **Chaib-draa, Brahim** Laval Univ.

**10:45-11:00**


- **Liu, Ziyuan** Inst. of Automatic Control Engineering, Tech.
- **Chen, Dong** Tech. Univ. München
- **v. Wichert, Georg** Siemens AG

**11:00-11:15**

**Game Solving for Industrial Automation and Control**, pp. 4367-4372.

- **Cheng, Chih-Hong** fortiss GmbH
- **Buckl, Christian** fortiss

Abstract Planning for Reactive Robots, pp. 4379-4384.

Searching Objects in Large-Scale Indoor Environments: A Decision-Theoretic Approach, pp. 4385-4390.
An Integrated 2D and 3D Location Measurement System Using Spiral Motion Positioner, pp. 4422-4427.
Lee, Geunho
Noguchi, Naoto
Kawasaki, Nobuya
Chong, Nak Young
Japan Advanced Inst. of Sci. & Tech.
Japan Advanced Inst. of Science and Tech.
Japan Advanced Institute of Science and Tech.
Japan Advanced Inst. of Sci. and Tech.

11:45-12:00 ThB08.6
An Occlusion-Aware Feature for Range Images, pp. 4428-4435.
Quadros, Alastair James
Underwood, James Patrick
Douillard, Bertrand
The Univ. of Sydney
The Univ. of Sydney
Univ. of Sydney

ThB09
Vision-Based Attention and Interaction (Regular Session)
Chair: Spinello, Luciano
Co-Chair: Song, Dezhen
Univ. of Freiburg
Texas A&M Univ.

10:30-10:45 ThB09.1
Zhao, Yipu
He, Mengwen
Zhao, Huijing
Davoine, Franck
Zha, Hongbin
Peking Univ.
Peking Univ.
Peking Univ.
CNRS
Peking Univ.

10:45-11:00 ThB09.2
Nunez-Varela, Jose
Ravindran, Balaraman
Wyatt, Jeremy
Univ. of Birmingham
IIT Madras
Univ. of Birmingham

11:00-11:15 ThB09.3
3D AAM Based Face Alignment under Wide Angular Variations Using 2D and 3D Data, pp. 4450-4455. Attachment
Wang, Chieh-Chih
Dopfer, Andreas
National Taiwan Univ.
National Taiwan Univ.

11:15-11:30 ThB09.4
Robots That Validate Learned Perceptual Models, pp. 4456-4462.
Klank, Ulrich
Mösenlechner, Lorenz
Maldonado, Alexis
Beetz, Michael
Tech. Univ. München
Tech. Univ. München
Tech. Univ. München
Tech. Univ. München

11:30-11:45 ThB09.5
Marshall, Matthew
Matthews, James
Hu, Ai-Ping
McMurray, Gary
Lipkin, Harvey
Georgia Tech. Res. Inst.
Georgia Tech. Res. Inst.
Georgia Tech. Res. Inst.
Georgia Tech.
x

11:45-12:00 ThB09.6
Leveraging RGB-D Data: Adaptive Fusion and Domain Adaptation for Object Detection, pp. 4469-4474.
Spinello, Luciano
Arras, Kai Oliver
Univ. of Freiburg
Univ. of Freiburg

ThB110
Interactive Session ThB-1 (Interactive Session)
Chair: Dillmann, Rüdiger
Co-Chair: Likhachev, Maxim
KIT Karlsruhe Inst. for Tech.
Carnegie Mellon Univ.
10:30-11:00 ThB110.1

A Compact 3-DOF Compliant Serial Mechanism for Trajectory Tracking with Flexures Made by Rapid Prototyping, pp. 4475-4480.

Zhao, Su Nanyang Tech. Univ.
Aye, Yan Naing Nanyang Tech. Univ.
Shee, Cheng Yap Nanyang Tech. Univ. Singapore
Chen, I-Ming Nanyang Tech. Univ.
Ang, Wei Tech Nanyang Tech. Univ.

10:30-11:00 ThB110.2

A System That Assists Group Conversation of Older Adults by Evaluating Speech Duration and Facial Expression of Each Participant During Conversation, pp. 4481-4486.

Yamaguchi, Taichi Univ. of Tokyo
Ota, Jun The Univ. of Tokyo
Otake, Mihoko The Univ. of Tokyo

10:30-11:00 ThB110.3


Kamezaki, Mitsuhiro Waseda Univ.
Iwata, Hiroyasu Waseda Univ.
Sugano, Shigeki Waseda Univ.

10:30-11:00 ThB110.4

Localization and Road Boundary Recognition in Urban Environments Using Digital Street Maps, pp. 4493-4499.

Irie, Kiyoshi Chiba Institute of Tech.
Tomono, Masahiro Chiba Institute of Tech.

10:30-11:00 ThB110.5

Combining Global and Local Planning with Guarantees on Completeness, pp. 4500-4506. Attachment

Zhang, Haojie Beijing Inst. of Tech.
Butzke, Jonathan Carnegie Mellon Univ.
Likhachev, Maxim Carnegie Mellon Univ.

ThB210 Interactive Session ThB-2 (Interactive Session) Ballroom D

Chair: Dillmann, Rüdiger KIT Karlsruhe Inst. for Tech.
Co-Chair: Likhachev, Maxim Carnegie Mellon Univ.

11:00-11:30 ThB210.1


Le, Dinh Phong Korea Inst. of Science and Tech.
Choi, Junho Korea Inst. of Science & Tech.
Kang, Sungchul Korea Inst. of Science & Tech.

11:00-11:30 ThB210.2

Alternative Interface System by Using Surface Electromyogram from Unusual Muscles Contraction, pp. 4513-4518.

Takahashi, Junji Univ. of Tsukuba
Hasegawa, Yasuhiisa Univ. of Tsukuba
Sankai, Yoshiyuki Univ. of Tsukuba

11:00-11:30 ThB210.3

Analytical Time-Optimal Trajectories for an Omni-Directional Vehicle, pp. 4519-4524.

Wang, Weifu Dartmouth Coll.
Balkcom, Devin Dartmouth Coll.

11:00-11:30 ThB210.4


Churchill, Winston Oxford Univ.
Newman, Paul Oxford Univ.

11:00-11:30 ThB210.5
### ThB310

**Interactive Session ThB-3 (Interactive Session)**

**Chair:** Dillmann, Rüdiger  
**Co-Chair:** Likhachev, Maxim  

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Mittendorfer, Philipp  
Cheng, Gordon  
| 11:30-12:00  | **Intuitive Operability Evaluation of Robotic Surgery Using Brain Activity Measurement to Identify Hand-Eye Coordination**, pp. 4546-4552. **Attachment**  
Miura, Satoshi  
Kobayashi, Yo  
Seki, Masatoshi  
Noguchi, Takehiko  
Kasuya, Masahiro  
Yokoo, Yuki  
Fujie, Masakatsu G.  
| 11:30-12:00  | **Formation Control of Mobile Robots Subject to Wheel Slip**, pp. 4553-4558.  
Tian, Yu  
Sarkar, Nilanjan  
| 14:30-14:45  | **Automated Parallel Cell Isolation and Deposition Using Microwell Array and Optical Tweezers**, pp. 4571-4576. **Attachment**  
Wang, Xiaolin  
Yan, Xiao  
Chen, Shuxun  
Sun, Dong  
| 14:45-15:00  | **Modeling and Compensation of Multivariable Creep in Multi-DOF Piezoelectric Actuators**, pp. 4577-4581.  
Rakotondrabe, Micky  
| 15:00-15:15  | **High Speed Cell Patterning by Dielectrophoresis and On-Chip Fabrication of Microstructure Embedding Patterned Cells**, pp. 4582-4587.  
Yue, Tao  
Nakajima, Masahiro  

Kojima, Masaru Nagoya Univ.
Fukuda, Toshio Nagoya Univ.

15:15-15:30 ThC01.4

Chen, Haoyao Harbin Inst. of Tech. Shenzhen Graduate School
Sun, Dong City Univ. of Hong Kong

15:30-15:45 ThC01.5

Development of the Auto Manipulation System towards the Single Cell Automatic Analysis Inside an Environmental SEM, pp. 4594-4599.
Shen, Yajing Nagoya Univ.
Nakajima, Masahiro Nagoya Univ.
Di, Pei Nagoya Univ.
Yue, Tao Nagoya Univ.
Kojima, Seiji Nagoya Univ.
Homma, Michio Nagoya Univ.
Fukuda, Toshio Nagoya Univ.

15:45-16:00 ThC01.6

μ-Cell Fatigue Test, pp. 4600-4605.
Fukui, Wataru Osaka Univ.
Kaneko, Makoto Osaka Univ.
Sakuma, Shinya Tohoku Univ.
Kawahara, Tomohiro Nagoya Univ.
Arai, Fumihito Nagoya Univ.

---

ThC02

Control of UAVs (Regular Session)

Chair: Bergbreiter, Sarah
Co-Chair: Byl, Katie

Meeting Room 2 (Chief Red Wing)

14:30-14:45 ThC02.1

Modeling and Control of a Quadrotor UAV with Tilting Propellers, pp. 4606-4613. Attachment
Ryll, Markus Max Planck Inst. for Biological Cybernetics
Buelthoff, Heinrich H. Max Planck Inst. for Biol. Cybernetics
Robuffo Giordano, Paolo Max Planck Inst. for Biological Cybernetics

14:45-15:00 ThC02.2

Mersha, Abeje Y. Univ. of Twente
Stramigioli, Stefano Univ. of Twente
Carloni, Raffaella Univ. of Twente

15:00-15:15 ThC02.3

Tunable Impedance: A Semi-Passive Approach to Practical Motion Control of Insect-Inspired MAVs, pp. 4621-4628.
Mahjoubi, Hosein Univ. of California Santa Barbara
Byl, Katie UCSB

15:15-15:30 ThC02.4

Learning Hover with Scarce Samples, pp. 4629-4634. Attachment
Lau, Tak Kit The Chinese Univ. of Hong Kong
Liu, Yunhui Chinese Univ. of Hong Kong

15:30-15:45 ThC02.5

A Bio-Inspired Active Tail Control Actuator for Nano Air Vehicles, pp. 4635-4640.
Penskiy, Ivan Univ. of Maryland, Coll. Park
Samuel, Paul Daedalus Flight Systems, LLC
Humbert, James Sean Univ. of Maryland
Bergbreiter, Sarah Univ. of Maryland, Coll. Park

15:45-16:00 ThC02.6
### ThC03

**Soft Tissue Interaction** (Regular Session)  
Meeting Room 3 (Mak'to)

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<td>Nia Kosari, Sina, Ramadurai, Srikrishnan, Chizeck, Howard, Hannaford, Blake</td>
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<td>Moreira, Pedro, Liu, Chao, Zemiti, Nabil, Poignet, Philippe</td>
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<td>Modeling of a Steerable Catheter Based on Beam Theory, pp. 4681-4686.</td>
<td>Khoshnam, Mahta, Azizian, Mahdi, Patel, Rajnikant V.</td>
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### ThC04

**Formal Methods** (Regular Session)  
Meeting Room 4 (Chief Wabasha)

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<td>Ding, Xu Chu, Wang, Jing, Lahijanian, Morteza, Paschalidis, Yannis, Belta, Calin</td>
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Robust Multi-Robot Optimal Path Planning with Temporal Logic Constraints, pp. 4693-4698. Attachment
Ulusoy, Alphan
Smith, Stephen L.
Ding, Xu Chu
Belta, Calin

15:00-15:15

Stunt Driving Via Policy Search, pp. 4699-4704. Attachment
Lau, Tak Kit
Liu, Yunhui

15:15-15:30

Probabilistic Control from Time-Bounded Temporal Logic Specifications in Dynamic Environments, pp. 4705-4710.
Medina Ayala, Ana Ivonne
Andersson, Sean
Belta, Calin

15:30-15:45

Non-Gaussian Belief Space Planning: Correctness and Complexity, pp. 4711-4717.
Platt, Robert
Tedrake, Russ
Kaelbling, Leslie
Lozano-Perez, Tomas

15:45-16:00

Proving the Correctness of Concurrent Robot Software, pp. 4718-4723.
Kazanzides, Peter
Kouskoulas, Yanni
Deguet, Anton
Shao, Zhong

ThC05

Robotic Software, Programming Environments, and Frameworks (Regular Session)

Chair: Anderson, Monica
Co-Chair: Jenkins, Odest Chadwicke

14:30-14:45

Kessens, Chad C.
Smith, Daniel
Osteen, Philip

14:45-15:00

OpenFABMAP: An Open Source Toolbox for Appearance-Based Loop Closure Detection, pp. 4730-4735.
Glover, Arren
Maddern, William
Warren, Michael
Reid, Stephanie
Milford, Michael J
Wyeth, Gordon

15:00-15:15

A Scripting-Based Approach to Robot Behavior Engineering Using Hierarchical Generators, pp. 4736-4741.
de Haas, Thij Jeffry
Laue, Tim
Röfer, Thomas

15:15-15:30

High-Resolution Depth Maps Based on TOF-Stereo Fusion, pp. 4742-4749.
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Chair: Yong, Yuen Kuan
Co-Chair: Leang, Kam K.
The Univ. of Newcastle
Univ. of Nevada, Reno

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Cornell Univ.
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Univ. of Nevada, Reno

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Univ. of Adelaide

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Univ. of Newcastle

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FAMU-FSU Coll. of Engineering, Florida State Univ.
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FAMU-FSU Coll. of Engineering
Barbu, Adrian
Florida State Univ.

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MIT
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MIT

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Kavraki, Lydia
Rice Univ.

Navigation and Visual Sensing (Regular Session) Meeting Room 8 (Wacipi)
Chair: Chaumette, Francois
INRIA Rennes-Bretagne Atlantique
Co-Chair: LaValle, Steven M
Univ. of Illinois


Erickson, Lawrence H
Univ. of Illinois at Urbana-Champaign
LaValle, Steven M
Univ. of Illinois

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Song, Meng
Nankai Univ.
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MIT

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Miksik, Ondrej
Brno Univ. of Tech.

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LIRMM - Univ. de Montpellier 2 CNRS
Spindler, Fabien
INRIA
Chaumette, Francois
INRIA Rennes-Bretagne Atlantique

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Li, Tao
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Kroeger, Torsten
Stanford Univ.
Padial, Jose
Stanford Univ.

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Chair: Bishop, Bradley
United States Naval Acad.
Co-Chair: Silvestre, Carlos
Inst. Superior Tecnico

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Macdonald, John  
McLain, T.W.  
Beard, Randy

ThC210  

Interactive Session ThC-2 (Interactive Session)

Chair: Kyriakopoulos, Kostas  
National Tech. Univ. of Athens  
Co-Chair: Moon, Hyungpil  
Sungkyunkwan Univ.

15:00-15:30 ThC210.1

A Dedicated Solver for Fast Operational-Space Inverse Dynamics, pp. 4943-4949.

Mansard, Nicolas  
CNRS

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Renda, Federico  
Levy, Guy  
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15:00-15:30 ThC210.3

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15:00-15:30 ThC210.4

Inverse Optimal Control for a Hybrid Dynamical System with Impacts, pp. 4962-4967.

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Bretl, Timothy

15:00-15:30 ThC210.5

Fabrication and Analysis of Planar Dielectric Elastomer Actuators Capable of Complex 3-D Deformation, pp. 4968-4973.

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Bastawros, Ashraf  
Hong, Wei  
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Interactive Session ThC-3 (Interactive Session)

Chair: Kyriakopoulos, Kostas  
National Tech. Univ. of Athens
15:30-16:00  ThC310.1

**A New Coriolis Matrix Factorization**, pp. 4974-4979.

Bjerkeng, Magnus  
Norwegian Univ. of Science and Tech.

Pettersen, Kristin Y.  
Norwegian Univ. of Science and Tech.

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**Pneumatic Muscle Actuated Continuum Arms: Modeling and Experimental Assessment**, pp. 4980-4985. [Attachment]

Godage, Isuru S.  
Istituto Italiano di Tecnologia

Branson, David  
Istituto Italiano di Tecnologia (IIT)

Guglielmino, Emanuele  
Istituto Italiano di Tecnologia

Caldwell, Darwin G.  
Italian Inst. of Tech.

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Stegall, Paul  
Univ. of Delaware

Winfree, Kyle  
Univ. of Delaware

Agrawal, Sunil  
Univ. of Delaware

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Anati, Roy  
Univ. of Pennsylvania

Scaramuzza, Davide  
Univ. of Pennsylvania

Derpanis, Konstantinos  
Univ. of Pennsylvania

Daniilidis, Kostas  
Univ. of Pennsylvania

15:30-16:00  ThC310.5

**Point Clouds Can Be Represented As Implicit Surfaces for Constraint-Based Haptic Rendering**, pp. 5000-5005. [Attachment]

Leeper, Adam Eric  
Stanford Univ.

Chan, Sonny  
Stanford Univ.

Salisbury, Kenneth  
Stanford Univ.

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**ThD01**

**Animation & Simulation** (Regular Session)

Chair: Murphey, Todd  
Northwestern Univ.

Co-Chair: Fiorini, Paolo  
Univ. of Verona

16:30-16:45  ThD01.1


Seghete, Vlad  
Northwestern Univ.

Murphey, Todd  
Northwestern Univ.

16:45-17:00  ThD01.2


Comella, Jordi  
Joint Res. Centre - European Commission

Zerbato, Davide  
Univ. of Verona

Giona, Luca  
Univ. of Verona

Fiorini, Paolo  
Univ. of Verona

Sequeira, Vitor  
Joint Res. Centre

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Butail, Sachit  
Univ. of Maryland

Chicoli, Amanda  
Univ. of Maryland

Paley, Derek  
Univ. of Maryland

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Allotta, Benedetto  
Univ. of Florence

Becciolini, Lorenzo  
Univ. di Firenze

Costanzi, Riccardo  
Univ. di Firenze
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Rander, Peter

Carnegie Mellon Univ.

17:45-18:00 ThD01.6

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Morales, Antonio

Lappeenranta Univ. of Tech.

16:30-16:45 ThD02.1

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Cheng, Fan-Tien
Hung, Min-Hsiung

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National Cheng Kung Univ.
Chinese Culture Univ.

16:45-17:00 ThD02.2

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Univ. of Toronto
Univ. of Toronto

17:00-17:15 ThD02.3

Qiao, Yan
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Zhou, MengChu

Guangdong Univ. of Tech.
Guangdong Univ. of Tech.
New Jersey Inst. of Tech.

17:15-17:30 ThD02.4

Lee, Jun-Ho
Lee, Tae-Eog

KAIST (Korea Advanced Inst. of Science and Tech.
KAIST

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Weigel-Jech, Michael
Fatikow, Sergej

Carl von Ossietzky Univ. Oldenburg, Div.
Univ. of Oldenburg

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Zheng, Li
Li, Jingshan

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Tsinghua Univ.
Univ. of Wisconsin - Madison
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<td>Bristol Robotics Lab.</td>
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<td>Yokohama National Univ.</td>
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<td>Yale Univ.</td>
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Univ. of Southern California  
Univ. of Washington  
Univ. of Washington

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Schiele, Andre  
Delft Univ. of Tech.  
DLR, German Aerospace Center  
German Aerospace Center (DLR)  
European Space Agency

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Tokyo Univ.  
Univ. of Tokyo  
Univ. of Tokyo

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Oh, Yonghwan  
Oh, Sang-Rok  
Korea Inst. of Science and Tech.  
KIST  
KIST

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Kuniyoshi, Yasuo  
The Univ. of Tokyo  
The Univ. of Tokyo  
Univ. of Tokyo  
The Univ. of Tokyo

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Yokohama National Univ.  
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Fainekos, Georgios Arizona State Univ.
Sankaranarayanan, Sriram Univ. of Colorado, Boulder

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Chen, Yushan Boston Univ.
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Belta, Calin Boston Univ.

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Chinchali, Sandeep Caltech
Livingston, Scott California Inst. of Tech.
Topcu, Ufuk California Inst. of Tech.
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Murray, Richard California Inst. of Tech.

17:45-18:00 ThD05.6
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Magnusson, Martin Örebro Univ.
Lilienthal, Achim, J. Örebro Univ.

16:45-17:00 ThD06.2
Dong-Si, Tue-Cuong Univ. of California, Riverside
Mourikis, Anastasios Univ. of California, Riverside

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Martinez-Carranza, Jose Univ. of Bristol
Calway, Andrew Univ. of Bristol

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Scherer, Sebastian Andreas Univ. of Tuebingen
Dube, Daniel Univ. of Tuebingen
Zell, Andreas Univ. of Tübingen

17:30-17:45 ThD06.5
A Visual Marker for Precise Pose Estimation Based on Lenticular Lenses, pp. 5222-5227. **Attachment**
Tanaka, Hideyuki National Inst. of AdvancedIndustrialScienceandTechnology (AI
Sumi, Yasushi National Inst. of Advanced Industrial Science andTechnology (AI
Matsumoto, Yoshio National Inst. of Advanced Industrial ScienceandTechnology (AI

17:45-18:00 ThD06.6
Robot Semantic Mapping through Wearable Sensor-Based Human Activity Recognition, pp. 5228-5233.
Sheng, Weihua Oklahoma State Univ.
Li, Gang Oklahoma State Univ.
Zhu, Chun Oklahoma State Univ.
Du, Jianhao Oklahoma State Univ.
Cheng, Qi Oklahoma State Univ.
### ThD07
#### Industrial Robotics (Regular Session)

**Chair:** Tomizuka, Masayoshi  
**Co-Chair:** Hamel, William R.

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Karlsson, Rickard  
Norrlof, Mikael  | Linköping Univ.  
Linkoping Univ.  
Linköping Univ. |
| 16:45-17:00   | ThD07.2       | A Sensor-Based Approach for Error Compensation of Industrial Robotic Workcells, pp. 5240-5245. | Tao, Pey Yuen  
Yang, Guilin  
Tomizuka, Masayoshi  | SIMTech  
Singapore Inst. of Manufacturing Tech.  
Univ. of California |
| 17:00-17:15   | ThD07.3       | A Modular and Extensible Framework for Real and Virtual Bin-Picking Environments, pp. 5246-5251. | Schyja, Adrian  
Hypki, Alfred  
Kuhlenkötter, Bernd  | TU Dortmund  
TU Dortmund  
TU Dortmund, Chair of Industrial Robotics and Production Automat |
| 17:15-17:30   | ThD07.4       | Robot End-Effector Sensing with Position Sensitive Detector and Inertial Sensors, pp. 5252-5257. | Wang, Cong  
Chen, Wenjie  
Tomizuka, Masayoshi  | Univ. of California, Berkeley  
Univ. of California, Berkeley  
Univ. of California |
| 17:30-17:45   | ThD07.5       | Experiments towards Automated Sewing with a Multi-Robot System, pp. 5258-5263. | Schrimpf, Johannes  
Wetterwald, Lars Erik  | NTNU  
SINTEF Raufoss Manufacturing |
| 17:45-18:00   | ThD07.6       | Automated Throwing and Capturing of Cylinder-Shaped Objects, pp. 5264-5270. | Frank, Thorsten  
Janoske, Uwe  
Mittnacht, Anton  
Schroedter, Christian  | Heilbronn Univ.  
Univ. of Wuppertal  
Reinhold-Wuerth-Univ.  
Heilbronn Univ. Campus Kuenzelsau Reinhold-Wuerth-Univ. |

### ThD08
#### Embodied Soft Robots (Invited Session)

**Chair:** Cianchetti, Matteo  
**Co-Chair:** Laschi, Cecilia

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Follador, Maurizio  
Mazzolai, Barbara  
Dario, Paolo  
Laschi, Cecilia  | Scuola Superiore Sant'Anna  
Scuola Superiore Sant'Anna  
Istituto Italiano di Tecnologia  
Scuola Superiore Sant'Anna  
Scuola Superiore Sant'Anna |
| 16:45-17:00   | ThD08.2       | The Application of Embodiment Theory to the Design and Control of an Octopus-Like Robotic Arm (I), pp. 5277-5282. | Guglielmino, Emanuele  
Zullo, Letizia  | Istituto Italiano di Tecnologia  
Italian Inst. of Tech. |
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17:45-18:00 ThD08.6

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Opportunistic Localization of Underwater Robots Using Drifters and Boats, pp. 5307-5314. Attachment

16:45-17:00 ThD09.2
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17:15-17:30 ThD09.4
Ho, Colin Arizona State Univ.
Mora, Andres Arizona State Univ.
Saripalli, Srikanth Arizona State Univ.

17:30-17:45 ThD09.5
Troni, Giancarlo Johns Hopkins Univ.
Yoerger, Dana Woods Hole Oceanographic Inst.
Whitcomb, Louis The Johns Hopkins Univ.

17:45-18:00 ThD09.6
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El Daou, Hadi Tallinn Univ. of Tech. Centre of Biorobotics
Salumae, Taavi Tallinn Univ. of Tech.
Tarning, Gert Tallinn Univ. of Tech.
Kruusmaa, Maarja Tallinn Univ. of Tech.

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Interactive Session ThD-1 (Interactive Session)
Chair: Gini, Maria Univ. of Minnesota
Co-Chair: Lee, Sukhan Sungkyunkwan Univ.

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Bui, Lam Quang Sungkyunkwan Univ.
Lee, Sukhan Sungkyunkwan Univ.

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Porikli, Fatih Mitsubishi Electric Res. Lab.
Papanikolopoulos, Nikos Univ. of Minnesota

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Li, Min King's Coll. London
Liu, Hongbin King's Coll. London
Li, Jichun King's Coll. London, Univ. of London
Seneviratne, Lakmal Kings Coll. London
Althoefer, Kaspar Kings Coll. London

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Kostarigka, Artemis Aristotele Univ. of Thessaloniki
Doulgeri, Zoe Aristotele Univ. of Thessaloniki
Rovithakis, George Aristotele Univ. of Thessaloniki

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<td>Univ. of Wisconsin-Madison, Univ. of Wisconsin-Madison, Univ. of Wisconsin - Madison</td>
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