

## IROS 2014 Program At A Glance

	Track 1 Grand Ballroom	Track 2 State Ballroom	Track 3 Red Lacquer Room	Interactive Salons	Crystal Room	Exhibit Hall	
<b>Sunday September 14</b>							
8:30-17:00	Workshops and Tutorials					Setup	
18:00-19:30	<b>Welcome Reception</b>						
<b>Monday September 15</b>							
8:00-8:20	Conference Welcome						
8:20-9:10	Plenary I: The Quest for Robotic Vision Peter Corke, Queensland U of Technology						
9:20-10:40	MoA1 Manipulation and Grasping I Robust and Optimal Control	MoA2 Localization and Mapping I Motion and Path Planning I	MoA3 Bioinspired Robots I Multi-Robot Coordination			Exhibits	
10:40-11:10	<b>Coffee Break</b>						
11:10-12:30	MoB1 Calibration and Identification Kinematics and Mechanism Design I	MoB2 Soft-Bodied Robotics Robot Learning I	MoB3 Navigation Visual Servoing	MoA Talks			
12:30-13:50	<b>Lunch; RSJ Power Lunch</b>						
13:50-15:10	MoC1 Micro-Nano Robots I Manipulation and Grasping II	MoC2 Humanoids and Bipeds I Computer Vision I	MoC3 Bioinspired Robots II Distributed Robotics	MoB Talks	Government Forum		
15:20-16:40	MoD1 Haptics Surgical Robotics I	MoD2 Human-Robot Interaction I Robot Learning II	MoD3 Formal Methods Software and Architecture	MoC Talks			
Evening	<b>Explore Chicago Social Events</b>						
<b>Tuesday September 16</b>							
8:00-8:50	Plenary II: Development of Neural Interfaces for Robotic Prosthetic Limbs Todd Kuiken, Rehab Inst of Chicago and Northwestern Univ						
9:00-10:20	TuA1 Manipulation and Grasping III Parallel Robotics	TuA2 Motion and Path Planning II Localization and Mapping II	TuA3 Search, Rescue, and Audition Field Robotics	MoD Talks			Exhibits
10:20-10:50	<b>Coffee Break</b>						
10:50-12:10	TuB1 Medical Robots and Systems I Rehabilitation Robotics I	TuB2 Human-Robot Interaction II Robot Learning III	TuB3 Marine Robotics Space Robotics	TuA Talks	Industry Forum: Perspectives on Entrepre- neurship in Robotics and Automation		
12:10-13:30	<b>Lunch; IEEE RAS Women in Engineering Lunch</b>						
13:30-14:50	TuC1 Dynamics and Control Manipulation and Grasping IV	TuC2 Humanoids and Bipeds II Domestic and Interactive Robots	TuC3 Localization and Mapping III Visual Servoing and Tracking	TuB Talks			
15:00-16:20	TuD1 Actuators Kinematics and Mechanism Design II	TuD2 Reasoning and AI Planning Path and Task Planning	TuD3 Sensing I Sensing for Human Environments	TuC Talks			
16:20-16:50	<b>Coffee Break</b>						
16:50-17:55	TuE1 Constrained and Underactuated Robots Legged Robots I	TuE2 Human-Robot Interaction III Grasp Learning	TuE3 Unmanned Aerial Systems I Localization and Pose Estimation	TuD Talks			
18:30-21:30	<b>Banquet at the Art Institute of Chicago, 111 S Michigan Ave</b>						
<b>Wednesday September 17</b>							
8:00-8:50	Plenary III: From Visual SLAM to Generic Real-time 3D Scene Perception Andrew Davison, Imperial College London						
9:00-10:20	WeA1 Medical Robots and Systems II Rehabilitation Robotics II	WeA2 Motion and Path Planning III Planning, Failure Detection and Recovery	WeA3 Networked Robots Swarm Robotics	TuE Talks		Exhibits	
10:20-10:50	<b>Coffee Break</b>						
10:50-12:10	WeB1 Mechanisms and Actuators Force and Tactile Sensing	WeB2 Humanoids and Bipeds III Human Detection and Tracking	WeB3 Collision Detection and Avoidance Sensing II	WeA Talks			
12:10-13:10	<b>Lunch; IEEE RAS Young Professional Lunch and IEEE RAS Student Lunch with Leaders</b>						
13:10-13:50	Awards Ceremony						
14:00-15:20	WeC1 Surgical Robotics II Teleoperation and Telerobotics	WeC2 Learning by Demonstration Industrial and Manufacturing Robots	WeC3 Localization and Mapping IV Locomotion, Navigation, and Mobility	WeB Talks			
15:20-15:50	<b>Coffee Break</b>						
15:50-17:10	WeD1 Micro-Nano Robots II Impedance, Compliance, and Force Control	WeD2 Unmanned Aerial Systems II Legged Robots II	WeD3 Computer Vision II Recognition	WeC Talks			
17:20-19:00	<b>Final Interactive Presentations (WeD Talks) and Farewell Party in the Interactive Salons</b>						
<b>Thursday September 18</b>							
8:30-17:00	Workshops and Tutorials					Navigation Contest	

## Welcome from the General and Program Chairs

Dear IROS 2014 Attendees,

Welcome to Chicago! We are honored to host you at the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems. We hope you enjoy the technical excellence and innovation on display at IROS 2014.

We received over 1600 paper submissions and nearly 50 workshop and tutorial submissions. Ultimately 750 papers and 27 workshops and tutorials were selected for the final program, with authors from nearly 50 countries from around the world.

This year, for the first time, IROS is experimenting with a new format, where each paper is assigned a 3-minute oral presentation and an 80-minute interactive presentation. Each oral session consists of up to 20 3-minute presentations along with one session keynote. In the session immediately following an oral presentation, the presenter presents the work in an interactive session, with the aid of their laptop and an LCD screen, to any attendee whose interest was piqued by the oral presentation. This format allows the number of parallel oral sessions to be shrunk to three, potentially providing larger audiences for the oral presentation, while creating an opportunity for more significant interaction with attendees with related interests.

This "pitch plus interactive" format has been used with success in the smaller, single-track RSS conference. It was also experimented with for a subset of papers at IROS 2011. At ICRA 2012 and ICRA 2013, some papers were chosen for purely interactive presentations (no oral presentations) while others were purely oral presentations. As the robotics community continues to experiment with formats to best serve conference-goers, we decided to try the experiment of treating all papers identically, as "pitch plus interactive." This contrasts with ICRA 2014, which used up to 19 parallel sessions in the "traditional" format. Feedback on the merits of these approaches will be sought from the robotics community, and this feedback will influence future conference organization.

Potential benefits of the "pitch plus interactive" format include a conference that is more physically compact and easier to navigate; potentially wider exposure for presenters' work; encouraging concise and effective presentations; a possibility to see a wider cross-section of current work in robotics; and greater opportunity for significant interaction and networking, particularly for more junior researchers. It also allows each paper to be treated identically, instead of some papers being selected for interactive presentations and some for oral presentations. Challenges include greater A/V support and technical and timing requirements; less in-depth technical presentations on topics that are of interest to you; moving between rooms during talks; and predicting attendance at oral vs. interactive presentations.

In addition to the new conference format, IROS 2014 features 39 session keynotes by leaders in the field; three plenary speeches; a vibrant industrial exhibition and talks from sponsors; special forums and panels on industry and entrepreneurship and government policy as it relates to robotics; and a number of other special events including lunches sponsored by the Robotics Society of Japan and the IEEE Robotics and Automation Society.

Time to socialize with colleagues and potential collaborators is also vital to a good conference, and IROS 2014 provides plenty of opportunities. In addition to the welcome and farewell receptions, the coffee breaks in the Exhibit Hall, and the banquet at the Art Institute of Chicago, the Monday night *Explore Chicago* social events allow attendees to customize their Chicago experience to their own interests. You can experience one of a variety of uniquely Chicago events: a river and lake architecture cruise, a Chicago Cubs baseball game, a show at the Second City Comedy Club, a blues show at Buddy Guy's Legends, or a bicycle ride along the Chicago lakefront, among others.

Putting together an event like this requires a tremendous amount of volunteer effort. We are fortunate to have an outstanding Organizing Committee. If you see one of them, please thank them for their effort!

Special recognition must go to the Conference Paper Review Board, which handled over 5000 reviews of the submitted papers and helped the Senior Program Committee pick the very best contributions for IROS 2014. The technical expertise of the CPRB was invaluable. Our deepest gratitude goes to Wolfram Burgard, the Editor-in-Chief of the CPRB, for his ethical, efficient, and professional handling of the entire review process.

Again, welcome to Chicago. We hope you find IROS 2014 both professionally and personally rewarding!



*Kevin M. Lynch*

Kevin Lynch  
Northwestern University  
IROS 2014 General Chair



*Lynne E. Parker*

Lynne Parker  
University of Tennessee  
IROS 2014 Program Chair

#### **Program Co-Chairs**

Seth Hutchinson (UIUC)  
Jose Neira (U Zaragoza)  
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Wolfram Burgard (U Freiburg)

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#### **Finance**

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#### **Awards**

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Brad Nelson (ETH Zurich)  
Kazuhito Yokoi (AIST)

#### **Publicity and Media**

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Howie Choset (Carnegie Mellon U)

#### **Competitions**

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#### **Local Arrangements**

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Satoshi Tadokoro (Tohoku U)  
Richard Vaughan (Simon Fraser U)  
Jing Xiao (UNC Charlotte)  
Kazuhito Yokoi (AIST)  
Jianwei Zhang (U Hamburg)

## Sessions and Exhibits

### Oral Sessions

Each oral session track is broken into two, possibly unrelated, half-sessions of approximately 10 papers. Each oral session is kicked off by an invited keynote not tied to a particular paper.

There are three parallel tracks for oral “pitches” in the Grand Ballroom, State Ballroom, and Red Lacquer Room. Speakers should sit at the front of the room during their session. Speakers with odd-numbered talks (talks 1, 3, 5, etc.) speak from the podium on the left side from the audience’s viewpoint. Speakers with even-numbered talks (2, 4, 6, etc.) speak from the podium on the right side. While the previous person is speaking, the next speaker has three minutes to connect their laptop to the projector. The projector and microphone inputs switch to the other podium after 3 minutes. Each talk must complete in three minutes, and there will be no time for questions.

Speakers can test their laptops on a simulated setup in the Ashland Room (see the hotel map) to make sure everything is working properly.

### Interactive Sessions

In the session immediately following an oral presentation (or the next morning if the talk is in the last session of the day), speakers present their work in the Interactive Salons, as shown on the hotel map. Speakers have an LCD screen to connect to their laptops and 80 minutes.

### Exhibits

Many thanks to our sponsors and exhibitors for their support of IROS 2014. You can see the latest robot products and services in the Exhibits Hall.

Gold Sponsor



Silver Sponsors



Bronze Sponsors



Exhibitors

- |                            |                                   |                        |
|----------------------------|-----------------------------------|------------------------|
| Adept Mobile Robots        | Haption                           | RoadNarrows Robotics   |
| Applied Dexterity          | Hokuyo Automatic Co, Ltd          | Robotnik               |
| ATI Industrial Automation  | IEEE Media Recruitment Services   | Robotiq                |
| Barrett Technology, Inc.   | Kinova                            | Robotis                |
| Butterfly Haptics, LLC     | Mathworks                         | RT Corporation         |
| Cambridge University Press | MIT Press                         | Shadow Robot Company   |
| Clearpath Robotics         | Natural Machine Motion Initiative | Smokie Robotics        |
| Engineered Arts            | Occam Vision Group                | Springer               |
| Festo                      | OptoForce                         | SimLab                 |
| Harmonic Drive, LLC        | Phoenix Technologies              | SynTouch, LLC          |
|                            |                                   | VectorNav Technologies |

## Plenaries



### Plenary I

#### **The Quest for Robotic Vision**

Peter Corke, Queensland University of Technology  
Monday, September 15, 8:20-9:10  
Grand/State Ballroom



### Plenary II

#### **Development of Neural Interfaces for Robotic Prosthetic Limbs**

Todd Kuiken, Rehabilitation Inst of Chicago and Northwestern University  
Tuesday, September 16, 8:00-8:50  
Grand/State Ballroom



### Plenary III

#### **From Visual SLAM to Generic Real-time 3D Scene Perception**

Andrew Davison, Imperial College London  
Wednesday, September 17, 8:00-8:50  
Grand/State Ballroom

## Government Forum

*Monday September 15, 13:50-16:40*

*Crystal Room*

*Chair: Vijay Kumar, University of Pennsylvania*

Policy makers from funding agencies in Asia, North America and Europe will talk about government funding priorities and government policy as it relates to robotics, and leaders in academia will outline new opportunities for engaging with government agencies to promote robotics research and development. The forum will consist of two sessions. Each session will consist of opening statements and a moderated question and answer session in which active audience participation is encouraged.

Panelists include Herman Bruyninckx (SPARC Initiative, Europe), Greg Hager (Computing Community Consortium, USA), Juha Heikkila (European Commission), Zexiang Li (Hong Kong University of Science and Technology), Atsushi Mano (NEDO, Japan), Sang-Rok Oh (KAIST, Korea), Jeff Trinkle (National Science Foundation, USA), Richard Voyles (White House Office of Science and Technology, USA), and Alex Zelinsky (Chief Defense Scientist, Australia).

## Industry Forum: Perspectives on Entrepreneurship in Robotics and Automation

*Tuesday September 16, 9:00-17:55*

*Crystal Room*

*Chairs: Raj Madhavan, University of Maryland and Torsten Kroeger, Google*

This forum brings together leading robotics companies and startups to formulate an action plan on the topic of entrepreneurship. This forum will provide a platform for stakeholders from academia, industry, government, and end-user communities to share their experiences, failures, suggestions, and wishlists. The forum will consist of 12-15 speakers and a panel discussion with participation from all attendees.

Speakers include Brandon Basso (3D Robotics, USA), Francois Boucher (Kinova, Canada), Guy Caverot (BA Systemes, France), Renaud Champion (Robolution Capital, France), Shahin Farschi (Lux Capital, USA), Ryan Gariepy (Clearpath Robotics, Canada), SK Gupta (National Science Foundation, USA), Ayanna Howard (Zyrobotics, USA), Christopher Parlitz (SCHUNK, Germany), Michael Peshkin (Northwestern U, USA), Erwin Prassler (euRobotics TG Entrepreneurship), and Shafa Wala (Tarsier Inc., USA).

## Special Events

### Welcome Reception

*Sunday September 14, 18:00-19:30*

*Grand/State Ballrooms*

Meet some friends, have a drink, and kickoff IROS 2014 in style.

### Conference Welcome

*Monday September 15, 8:00-8:20*

*Grand/State Ballrooms*

*Chair: Kevin Lynch*

The official conference welcome will be just in advance of Plenary I.

### Coffee Breaks

Most coffee breaks will take place in the Exhibit Hall.

### Sponsored Lunches

The Robotics Society of Japan and the IEEE Robotics and Automation Society are sponsoring several lunches at the Palmer House during IROS 2014.

- **RSJ Power Lunch (Monday):** Hear about new technologies and products from representatives of IROS 2014 exhibitors and sponsors while you eat lunch. Lunch is complimentary but first-come first-served. Grand, State, and Red Lacquer Rooms.
- **IEEE RAS Women in Engineering Luncheon (Tuesday):** The WiE luncheon provides an opportunity for all female and male professionals who are interested in women engineering education to discuss the subjects of career path, career/family choices, and other topics. Chicago Room, 5th floor. \$5 USD registration required; see <http://www.iros2014.org/program/luncheons>.
- **IEEE RAS Lunch with Leaders (LwL) – Student Luncheon (Wednesday):** Lunch with Leaders (LwL) offers IEEE student members an opportunity to network with RAS leaders, and get advice and mentoring on their career and research. Crystal Room. \$5 USD registration required; see <http://www.iros2014.org/program/luncheons>.
- **IEEE RAS Young Professionals Lunch (Wednesday):** This luncheon is open to recent IEEE graduates, so that they can network with peers and find out more about the benefits of RAS. Chicago Room, 5th floor. \$5 USD registration required; see <http://www.iros2014.org/program/luncheons>.

### Explore Chicago Social Events

*Monday evening, September 15*

More information on the Monday night *Explore Chicago* social events can be found on the next pages.

### Conference Banquet

*Tuesday September 16, 18:30-21:30*

*Art Institute of Chicago, 111 S Michigan Ave*

The world-famous collection of the Art Institute of Chicago is just a two-block walk from the Palmer House Hilton. Some of the galleries will be open for viewing, and there will be multiple indoor and outdoor food and drink stations.

## **Awards Ceremony**

*Wednesday September 17, 13:10-13:50*

*Grand/State Ballrooms*

IROS 2014 will present the following awards at a ceremony after lunch on Wednesday:

- IROS Harashima Award for Innovative Technologies
- Best Paper Award
- ABB Best Student Paper Award
- ICROS Best Application Paper Award
- NTF Award for Entertainment Robots and Systems
- JTCF Novel Technology Paper Award for Amusement Culture
- RoboCup Best Paper Award
- CoTeSys Cognitive Robotics Best Paper Award

## **Farewell Party**

*Wednesday September 17, 17:20-19:00*

*Interactive Salons*

The Farewell Party will be in conjunction with the final interactive session. Robots, beer, and wine, not bad!

## **Kinect Autonomous Mobile Robot Navigation Contest**

*Thursday September 18, 8:00-17:00*

*Exhibit Hall*

On Thursday September 18, the Exhibit Hall transforms into the site for this day-long mobile robot navigation contest, sponsored by Microsoft and Adept Mobile Robots. Ten pre-qualified teams will compete for navigation supremacy in a natural café-like environment.

## **Technical Tour of the Rehabilitation Inst of Chicago and Northwestern University**

*Thursday September 18, 15:30-17:30*

*345 East Superior St*

This tour will visit robotics labs of the Rehabilitation Institute of Chicago (RIC), the world's leading hospital and research enterprise in physical medicine and rehabilitation, and Northwestern University's Neuroscience and Robotics Lab (NxR). The tour will take place entirely on the downtown campus (no trip to Northwestern's main campus in Evanston). Attendees are responsible for their own transportation to RIC. Tickets are purchased through the registration site.

## **Hops 'n Bots at the Adler Planetarium**

*Thursday September 18, 18:00-22:00*

*Adler Planetarium, 1300 S Lake Shore Drive*

In honor of IROS 2014, the Adler Planetarium will be holding an after-hours robot-themed craft beer party on Thursday night. This is part of the *Adler After Dark* series, a monthly social event popular with young Chicagoans. See the planetarium, listen to bands, try the featured craft beers, and get the best views of the Chicago skyline, while members of the IROS community participate in a panel discussion and other events. The Adler Planetarium sits on the easternmost point of the Museum Campus, right on Lake Michigan, and is a pleasant 3 km walk from the Palmer House through Grant Park. Tickets are \$20 at the door. You can find more information at <http://www.adlerplanetarium.org/adler-after-dark/>.

## **Explore Chicago Social Events**

### **Monday September 15**

On Monday night, there will be eight social events at various spots around Chicago. Each conference registration comes with a ticket to one event. All transit to the social events will be by walking or public transportation (the L). To take the L, use a single-ride ticket when you enter (available for purchase at all stations for \$3 if you don't have one); it's not needed at the exit.

It is highly recommended that you meet your group in the Palmer House lobby or near the registration desks at the times indicated below. Further information on the social event locations is given below in case you get separated from your group. Remember the Palmer House is at 17 E Monroe St, at the corner of Monroe St and Wabash Ave.

**Bicycling the Lakefront Trail (meet at 5:00 PM in lobby):** Bicycles will be leaving from the Bike and Roll storefront at 239 E Randolph St in Millennium Park. This is a 1 km walk from the Palmer House. Go east on Monroe St to Michigan Ave, north on Michigan Ave to Randolph St, and east on Randolph St to 239 E Randolph.

**Blues Show at Buddy Guy's Legends (meet at 7:00 PM at the registration desks):** Buddy Guy's is at 700 S Wabash Ave, a 1 km walk from the Palmer House. Walk south on Wabash Ave. Dinner will be provided at the show.

**Chicago Cubs Baseball Game at Wrigley Field (meet at 5:50 PM in lobby):** Wrigley Field is a 20-minute ride on the CTA L Red Line (10 km by taxi). Take the Red Line toward Howard from the Monroe station at the corner of State St and Monroe St (½ block west of the Palmer House) and get off at the Addison stop. To return, you can take the Red Line back from Addison, but the station may be very crowded at the end of the game. In that case, it is recommended you make a group of three or four people and take a taxi back to the Palmer House (approximately \$20). You may need to walk east on Addison a couple of blocks to get away from the crowds to find an open taxi. Alternatively, leave before the end of the game or hit a Wrigleyville bar after the game until the crowds dissipate. Bars on Clark St are especially popular.

**Chicago River and Lake Michigan Cruise (meet at 5:30 PM in lobby):** The cruise boats will leave from the dock east of the Trump Tower north of the Chicago River. It is a 1 km walk north on Wabash Ave. After crossing the river, go down to the walkway along the river and go east to the Wendella dock. Drinks will be provided on the boat, but no food.

**Chocolate Tasting Tour of Chicago (meet at 5:10 PM in lobby):** The tour will start at the Visitor Information Center in the lower level of the Macy's building at 111 N State St. Walk west a half block and then north on State St (less than ½ km).

**Goose Island Brew Pub and Brewery Tour (meet at 6:20 PM in lobby):** Goose Island is at 1800 N Clybourn Ave, 5 km from the Palmer House. To get there, take the CTA L Red Line toward Howard from the Monroe station at the corner of State St and Monroe St (½ block west of the Palmer House) and get off at the North/Clybourn stop. Walk ½ km northwest on Clybourn. Reverse the directions to get back.

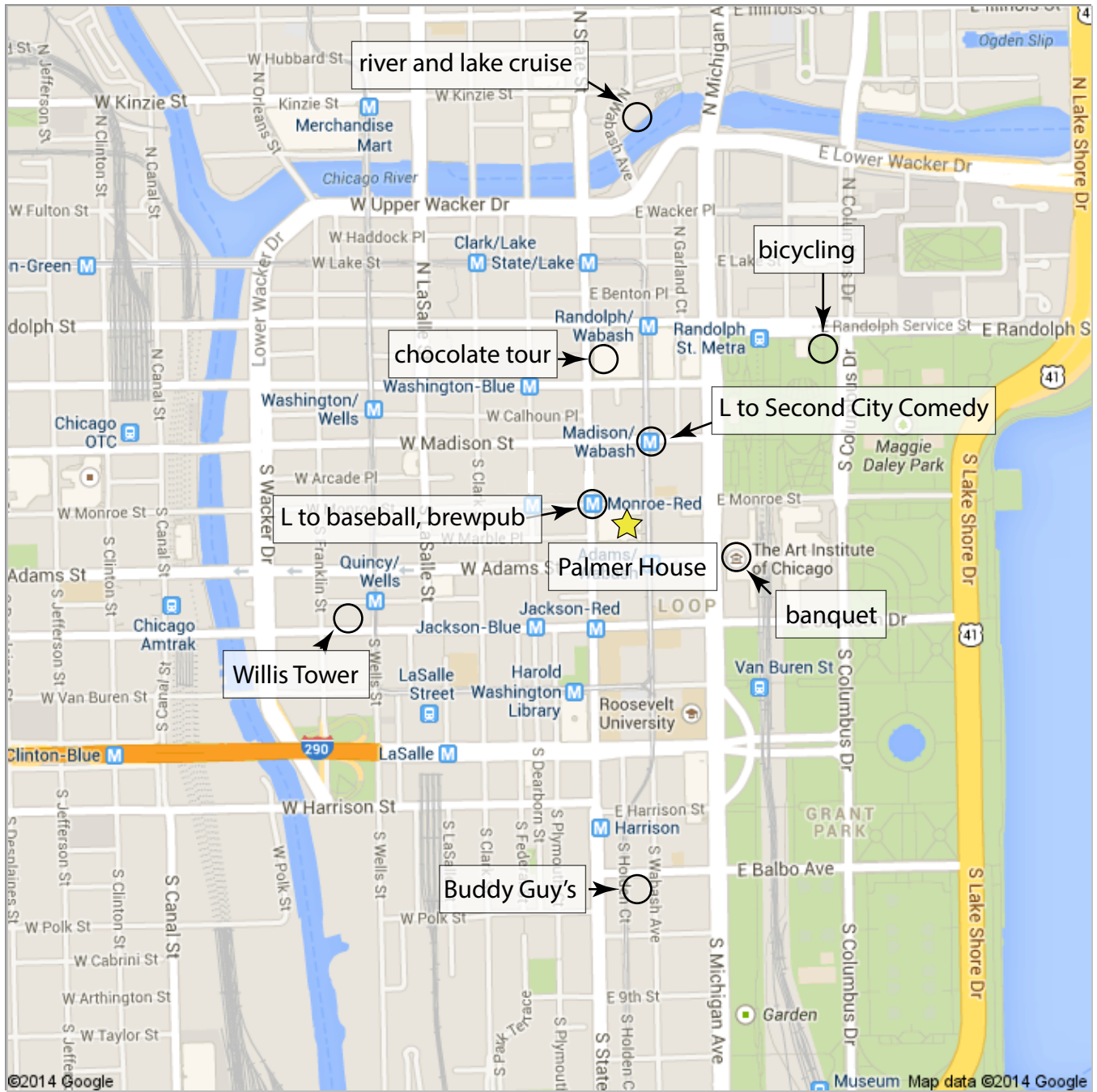
**Observation Deck at the Willis Tower (meet at 5:30 PM at the registration desks):** Enter the Willis Tower for the Skydeck on Jackson Ave between Franklin St and Wacker Dr, a 1 km walk. Go west on Monroe St to Franklin St, south on Franklin St, then west on Jackson Ave.

**Second City Comedy Show (meet at 6:45 PM in lobby):** Second City is at 1616 N Wells St, 4.5 km from the Palmer House. Take the CTA L Brown Line toward Kimball from the Madison/Wabash station (1 block north on Wabash) to the Sedgwick station. Then walk 1 block north to North Ave, east on North Ave to Wells St, then north on Wells St (about a ½ km walk). To go back to the Palmer House, you can take the Brown Line in the other direction, but it will loop around the downtown Loop before returning to Madison/Wabash, adding 5 minutes to your trip.

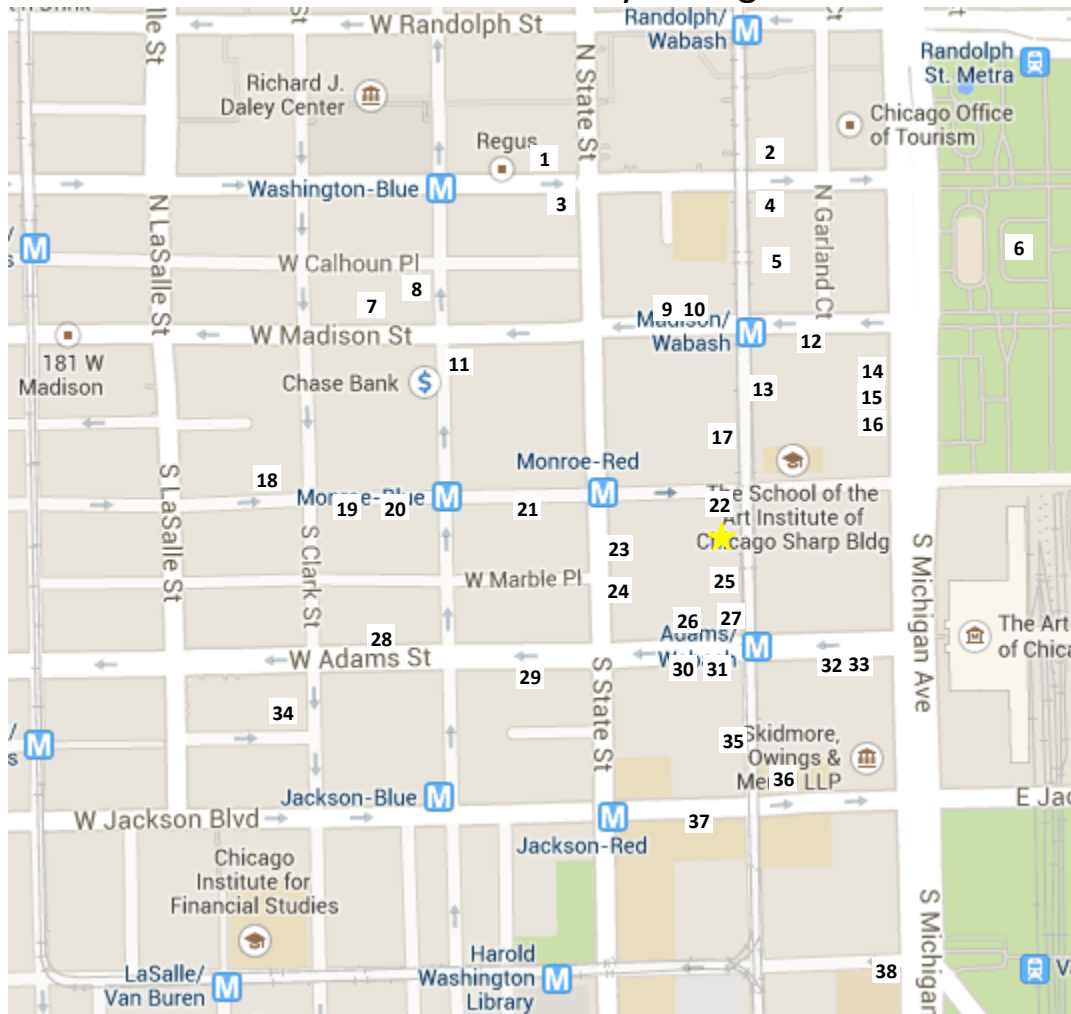


## Social Event Map

For the Monday night Explore Chicago events, please meet your group in the lobby or registration desk as indicated on the previous page; do not go directly to the event site.



## IROS 2014 Nearby Dining



### Inexpensive (\$)

1. Which Wich (Sandwiches)
4. Pittsfield Café (Diner, Brunch)
5. Oasis Café (Mediterranean)
9. Jimmy John's (Sandwiches)
10. Chipotle (Mexican, Fast Food)
13. Popeye's (Chicken, Fast Food)
18. I Dream of Falafel (Middle Eastern)
19. Pret A Manger (Café, Sandwiches)
20. Potbelly Sandwich Shop (Sandwiches)
22. Corner Bakery Café (Café, Bakery)
26. Max's Take Out (Fast Food)
27. McDonalds (Fast Food)
28. Zoup! (Café, Sandwiches)
30. America's Dog (Hot Dogs, Fast Food)
31. Halo Asian Mix (Asian Fusion)
32. Panda Express (Chinese, Fast Food)
36. Abou Andre (Middle Eastern, Mediterranean)
38. Osaka Express (Japanese)

### Moderate (\$\$)

2. Heaven on Seven (Southern, Cajun/Creole)
6. Park Grill (New American)
7. Rosebud Theater District (Italian)
12. Pizano's Pizza & Pasta (Pizza, Italian)
16. Hot Woks Cool Sushi (Japanese, Asian)
17. Flat Top Stir-Fry Grill (Asian Fusion, Grill)
21. The Grillroom (Steakhouse)
23. Freshii (Vegetarian, New American)
24. Beef and Brandy (Traditional American)
25. Miller's Pub (Pub, Traditional American)
29. Berghoff Restaurant (German)
34. Native Foods Café (Vegetarian)
35. Exchequer (Pub, Pizza, Steakhouse)
37. Pazzo's Cucina Italiana (Italian)

### Expensive (\$\$\$)

- Lockwood Palmer House (New American)
3. Atwood Café (New American)
8. Trattoria No. 10 (Italian)
11. Rosebud Prime (Steakhouse)
14. Henri (French)
15. The Gage (New American, Gastropub)
33. Russian Tea Time (Russian)

<b>Restaurant Name</b>	<b>Price</b>	<b>Style</b>	<b>Address</b>	<b>Website</b>	<b>Phone Number</b>
Lockwood (Palmer House)	\$\$\$	American (New)	17 East Monroe Street	www.lockwoodrestaurant.com	(312) 917-3404
1 Which Wich	\$	Sandwiches	108 North State Street #002	www.whichwich.com	(312) 658-0030
2 Heaven on Seven	\$\$	Southern, Cajun/Creole	111 North Wabash Avenue	www.heavenonseven.com	(312) 263-6443
3 Atwood	\$\$\$	American (New)	1 West Washington Street	www.atwoodcafe.com	(312) 368-1900
4 Pittsfield Cafe	\$	Diner, Brunch	55 East Washington Street	www.pittsfield55.com	(312) 641-1806
5 Oasis Cafe	\$	Mediterranean	21 North Wabash Avenue #11	www.oasiscafeone.com	(312) 443-9534
6 Park Grill	\$\$	American (New)	11 North Michigan Avenue	www.parkgrillchicago.com	(312) 521-7275
7 Rosebud Theater District	\$\$	Italian	70 West Madison Street	www.rosebudrestaurants.com	(312) 332-9500
8 Trattoria No. 10	\$\$\$	Italian	10 North Dearborn Street #1	www.trattoriaten.com	(312) 984-1718
9 Jimmy John's	\$	Sandwiches, Deli	6 East Madison Street	www.jimmyjohns.com	(312) 368-4444
10 Chipotle	\$	Mexican, Fast Food	8 East Madison Street	www.chipotle.com	(312) 629-3662
11 Rosebud Prime	\$\$\$	Steakhouse	1 South Dearborn Street	www.rosebudrestaurants.com	(312) 384-1900
12 Pizano's Pizza & Pasta	\$\$	Pizza, Italian	61 East Madison Street	www.pizanoschicago.com	(312) 236-1777
13 Popeye's	\$	Fast Food, Chicken	17 South Wabash Avenue	www.popeyes.com	(312) 372-8855
14 Henri	\$\$\$	French	18 South Michigan Avenue	www.henrichicago.com	(312) 578-0763
15 The Gage	\$\$\$	American (New), Gastropub	24 South Michigan Avenue	www.thegagechicago.com	(312) 372-4243
16 Hot Woks Cool Sushi	\$\$	Japanese, Chinese, Thai	30 South Michigan Avenue	www.hotwokscoolsushi.com	(312) 345-1234
17 Flat Top Stir-Fry Grill	\$\$	Asian Fusion, Grill	30 South Wabash Avenue	www.flatopgrill.com	(312) 726-8400
18 I Dream of Falafel	\$	Middle Eastern	112 West Monroe Street	www.idreamoffalafel.com	(312) 263-4363
19 Pret A Manger	\$	Cafe, Sandwiches	73 West Monroe Street	www.pret.com	(312) 260-4301
20 Potbelly Sandwich Shop	\$	Sandwiches, Deli	55 West Monroe Street	www.potbelly.com	(312) 577-0070
21 The Grillroom	\$\$	Steakhouse	33 West Monroe Street	www.grillroom-chicago.com	(312) 960-0000
22 Corner Bakery Cafe	\$	Cafe, Bakery	35 East Monroe Street	www.cornerbakerycafe.com	(312) 372-0072
23 Freshii Palmer House	\$\$	Vegetarian, American (New)	17 East Monroe Street #10	www.freshii.com	(312) 419-1777
24 Beef and Brandy	\$\$	American (Traditional)	127 South State Street	www.beefbrandy.net	(312) 372-3451
25 Miller's Pub	\$\$	Pub, American (Traditional)	134 South Wabash Avenue	www.millerspub.com	(312) 263-4988
26 Max's Take Out	\$	Fast Food	20 East Adams Street	www.maxstakeoutchicago.com	(312) 553-0170
27 McDonalds	\$	Fast Food	144 South Wabash Avenue	www.mcdonalds.com	(773) 218-8516
28 Zoupi	\$	Cafe, Sandwiches	62 West Adams Street	www.zoupi.com	(312) 470-9797
29 Berghoff Restaurant	\$\$	German	17 West Adams Street	www.theberghoff.com	(312) 427-3170
30 America's Dog	\$	Hot Dogs, Fast Food	21 East Adams Street	www.americasdogg.com	(312) 786-0100
31 Halo Asian Mix	\$	Asian Fusion	29 East Adams Street	www.haloasianmix.com	(312) 360-1111
32 Panda Express	\$	Chinese, Fast Food	77 East Adams Street	www.pandaeexpress.com	(312) 986-1043
33 Russian Tea Time	\$\$\$	Russian	77 East Adams Street	www.russianteatime.com	(312) 360-0000
34 Native Foods Cafe	\$\$	Vegetarian	218 South Clark Street	www.nativefoods.com	(312) 332-6332
35 Exchequer	\$\$	Pub, Pizza, Steakhouse	226 South Wabash Avenue	www.exchequerpub.com	(312) 939-5633
36 Abou Andre	\$	Middle Eastern, Mediterranean	60 East Jackson Boulevard	www.abouandre.com	(312) 386-1300
37 Pazzo's Cucina Italiana	\$\$	Italian	23 East Jackson Boulevard	www.pazzoscucina.com	(312) 386-9400
38 Osaka Express	\$	Japanese	400 South Michigan Avenue	www.osaka2go.com	(312) 566-0118

# IROS 2014 Workshops and Tutorials

Coffee breaks are at 10:00-10:30 and 15:00-15:30.

Sunday September 14		
SuAM1	8:30-12:00	Grand An Open-source Recipe for Teaching (and Learning) Robotics with a Simulator: Setup a Laptop in 5 Minutes, Write a Control, Navigation, Vision or Manipulation Program in 100 Lines of Code <i>Renaud Detry, Peter Corke, Marc Andreas Freese</i>
SuAM2	8:30-12:00	State Taxonomies of Interconnected Systems: Topology in Distributed Robotics <i>Ryan Williams, Andrea Gasparri, Gaurav Sukhatme</i>
SuPM1	13:30-17:00	Grand How to Use MATLAB-ROS Interface to Prototype Robotics Algorithms for ROS-powered Robots <i>Yanliang Zhang</i>
SuPM2	13:30-17:00	State Aerial Open Source Robotics <i>Lorenz Meier, Markus W. Achtelik, Brandon Basso</i>
SuFD3	8:30-17:00	Salon 1 Human-robot Collaboration in Standardization and R&D Activities <i>Gurvinder Singh Virk, Roger Bostelman, Seungbin B. Moon, Tamas Haidegger, Fabio Paolo Bonsignorio, Federico Vicentini, Paolo Barattini</i>
SuFD4	8:30-17:00	Salon 2 The 2014 IROS Workshop on AI and Robotics <i>Lorenzo Riano, Alessandro Saffiotti, Moritz Tenorth, George Dimitri Konidaris, Nick Hawes, Siddharth Srivastava</i>
SuFD5	8:30-17:00	Salon 3 Machine Learning in Planning and Control of Robot Motion Workshop <i>Maria Gini, Marco Morales, Angela P. Schoellig, Lydia Tapia, Aleksandra Faust, Farbod Farshidian</i>
SuFD6	8:30-17:00	Salon 5 Modular and Swarm Systems — from Nature to Robotics <i>Roderich Gross, Rico Moeckel, Michael Rubenstein, Kasper Stoy</i>
SuFD7	8:30-17:00	Salon 6 Micro-Nano Robotic Swarms for Biomedical Applications <i>Spring Berman, Sabine Hauert, Sangeeta Bhatia, Bradley Nelson, Vijay Kumar</i>
SuFD8	8:30-17:00	Salon 7 From Active Impedance to Intrinsically Compliant and Variable Impedance Actuators: Pros, Cons and Trade-offs <i>Nikolaos Tsagarakis, Bram Vanderborght, Luis Sentis</i>
SuFD9	8:30-17:00	Salon 8 Assistive Robots for Individuals with Disabilities: HRI Issues and Beyond <i>Hae Won Park, Momotaz Begum, Chung Hyuk Park</i>
SuFD10	8:30-17:00	Salon 9 Assistance and Service Robotics in a Human Environment <i>Anne Spalanzani, David Daney, Samer Mohammed, Yacine Amirat, Ren Luo, Rachid Alami, Christian Laugier</i>
SuFD11	8:30-17:00	Salon 10 Robot Manipulation: What Has Been Achieved and What Remains to Be Done? <i>Erol Sahin, Siddhartha Srinivasa</i>
SuFD12	8:30-17:00	Salon 12 6th Workshop on Planning, Perception and Navigation for Intelligent Vehicles <i>Philippe Martinet, Christian Laugier, Christoph Stiller, Urbano Nunes</i>

## Thursday September 18

ThAM1	8:30-12:00	State	3rd Workshop on Visual Control of Mobile Robots <i>Gonzalo Lopez-Nicolas, Youcef Mezouar</i>
ThPM1	13:30-17:00	State	Standardized Knowledge Representations and Ontologies for Robotics and Automation <i>Paulo Gonçalves, Craig Schlenoff, Edson Prestes, Tamas Haidegger</i>
ThFD2	8:30-17:00	Grand	Rehabilitation and Assistive Robotics: Bridging the Gap Between Clinicians and Roboticists <i>Brenna Argall, Siddhartha Srinivasa</i>
ThFD3	8:30-17:00	Salon 1	Towards Horizon 2020: Trends and Challenges in Micro/Nanorobotics <i>Michael Gauthier, Fumihito Arai, Metin Sitti, Bradley J. Nelson</i>
ThFD4	8:30-17:00	Salon 2	Real-time Motion Generation and Control — Constraint-based Robot Programming <i>Andrea Maria Zanchettin, Gianni Borghesan, Torsten Kroeger</i>
ThFD5	8:30-17:00	Salon 3	3rd Workshop on Robots in Clutter: Perception and Interaction in Clutter <i>Michael Zillich, Dejan Pangercic, Maren Bennewitz, Justus Piater, Maria Fox</i>
ThFD6	8:30-17:00	Salon 4	Community Consensus Benchmarks and Systems for Clinical Translation of Medical Robots <i>Nabil Simaan, Venkat Krovi, Peter Kazanzides, Simon P. DiMaio</i>
ThFD7	8:30-17:00	Salon 5	The Role of Human Sensorimotor Control in Surgical Robotics <i>Ilana Nisky, Tony Jarc</i>
ThFD8	8:30-17:00	Salon 6	Telerobotics for Real-Life Applications: Opportunities, Challenges, and New Developments <i>Dongjun Lee, Jordi Artigas, Shahin Sirouspour, Seiichiro Katsura</i>
ThFD9	8:30-17:00	Salon 7	Compliant Manipulation: Challenges in Learning and Control <i>Klas Kronander, Aude Billard, Etienne Burdet, Jonas Buchli</i>
ThFD10	8:30-17:00	Salon 8	Workshop on Active Touch Sensing in Robots and Animals <i>Yon Visell, Vincent Hayward, Mitra Hartmann, Nathan Lepora</i>
ThFD11	8:30-17:00	Salon 10	The Future of Multiple Robot Research and its Multiple Identities <i>Lorenzo Sabattini, Antonio Franchi, Dylan Shell, Nora Ayanian</i>
ThFD12	8:30-17:00	Salon 12	Whole-Body Control for Robots in the Real World <i>Federico Lorenzo Moro, Michael Gienger, Oussama Khatib, Eiichi Yoshida</i>

## Monday Session A, 09:20 - 10:40

<b>Grand Ballroom</b>	<b>State Ballroom</b>	<b>Red Lacquer Room</b>
<b>MoA1</b>	<b>MoA2</b>	<b>MoA3</b>
<b>Manipulation and Grasping I &amp; Robust and Optimal Control</b>	<b>Localization and Mapping I &amp; Motion and Path Planning I</b>	<b>Bioinspired Robots I &amp; Multi-Robot Coordination</b>

Chair	Khatib, Oussama (Stanford University)	Oriolo, Giuseppe (Sapienza University of Rome)	Gini, Maria (University of Minnesota)
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#	Time	Session Keynote	Session Keynote	Session Keynote
1	09:20-09:40	Keynote: What is Manipulation? <i>Mason, Matthew T.</i> Carnegie Mellon University	Keynote: Dense, Object-based 3D SLAM <i>Leonard, John</i> MIT	Keynote: Bio-inspired Multi-modal Flying Robots <i>Floreano, Dario</i> EPFL

		Manipulation and Grasping I	Localization and Mapping I	Bioinspired Robots I
2	09:40-09:43	Robotic Manipulation in Object Composition Space <i>Pajarinen, Joni; Kyrki, Ville</i>	Mining Visual Phrases for Long-Term Visual SLAM <i>Tanaka, Kanji; chokushi, yuuto; ando, masatoshi</i>	Modeling of Underwater Snake Robots Moving in a Vertical Plane in 3D <i>Kelasidi, Eleni; Pettersen, Kristin Y.; Gravdahl, Jan Tommy</i>
3	09:43-09:46	6D Proximity Servoing for Preshaping and Haptic Exploration Using Capacitive Tactile Proximity Sensors <i>Escaida Navarro, Stefan; Schonert, Martin; Hein, Björn; Woern, Heinz</i>	Towards Indoor Localization Using Visible Light Communication for Consumer Electronic Devices <i>Liu, Ming; Qiu, Kejie; Che, Fengyu; Li, Shaohua; Hussain, Babar; Wu, Liang; Yue, C. Patrick</i>	Actuation Strategy for Underactuated Anthropomorphic Hands <i>Tavakoli, Mahmoud; Enes, Baptiste; Marques, Lino; de Almeida, Anibal</i>
4	09:46-09:49	Multi-Joint Gripper with Differential Gear System <i>Tamamoto, Takumi; Sayama, Kazuhiro; Koganezawa, Koichi</i>	Network Localization from Relative Bearing Measurements <i>Kennedy, Ryan; Taylor, Camillo Jose</i>	New Rolling and Crawling Gaits for Snake-Like Robots <i>Primerano, Richard; Wolfe, Stephen</i>
5	09:49-09:52	Artificial Hand with Stiffness Adjuster <i>Koganezawa, Koichi; Ito, Akira</i>	2D-3D Camera Fusion for Visual Odometry in Outdoor Environments <i>Paudel, Danda Pani; Demonceaux, Cédric; Habed, Adlane; Vasseur, Pascal; Kweon, In So</i>	iSplash-MICRO: A 50mm Robotic Fish Generating the Maximum Velocity of Real Fish <i>Clapham, Richard James; Hu, Huosheng</i>
6	09:52-09:55	Design and Implementation of a Low-Cost and Lightweight Inflatable Robot Finger <i>Qi, Ronghua; Lam, Tin Lun; Xu, Yangsheng</i>	Position Control of a Robot End-Effector Based on Synthetic Aperture Wireless Localization <i>Vossiek, Martin; Konigorski, Ulrich; Marschall, Albert; Li, Gang; Voigt, Thorsten</i>	Mamba - A Waterproof Snake Robot with Tactile Sensing <i>Liljebäck, Pål; Stavdahl, Øyvind; Pettersen, Kristin Y.; Gravdahl, Jan Tommy</i>
7	09:55-09:58	Design of Hands for Aerial Manipulation: Actuator Number and Routing for Grasping and Perching <i>Backus, Spencer; Odhner, Lael; Dollar, Aaron</i>	Static forces weighted Jacobian motion models for improved Odometry <i>Hidalgo-Carrio, Javier; Babu, Ajish; Kirchner, Frank</i>	Multi-Arm Robotic Swimming with Octopus-Inspired Compliant Web <i>Sfakiotakis, Michael; Kazakidi, Asimina; Chatzidaki, Avgousta; Evdaimon, Theodoros; Tsakiris, Dimitris</i>
8	09:58-10:01	Robust Model Free Control of Robotic Manipulators with Prescribed Transient and Steady State Performance <i>Bechlioulis, Charalampos; Liarokapis, Minas; Kyriakopoulos, Kostas</i>	Visual Localization within LIDAR Maps for Automated Urban Driving <i>Wolcott, Ryan; Eustice, Ryan</i>	ReBiS - Reconfigurable Bipedal Snake Robot <i>Thakker, Rohan; Kamat, Ajinkya; Bharambe, Sachin; Chiddarwar, Shital; BHURCHANDI, KISHOR</i>
9	10:01-10:04	Dual Execution of Optimized Contact Interaction Trajectories <i>Toussaint, Marc; Ratliff, Nathan; Bohg, Jeannette; Righetti, Ludovic; Englert, Peter; Schaal, Stefan</i>	Decentralized Cooperative Trajectory Estimation for Autonomous Underwater Vehicles <i>Paull, Liam; Seto, Mae; Leonard, John</i>	Role of Compliant Leg in the Flea-Inspired Jumping Robot <i>Jung, Gwang-Pil; Kim, Ji-Suk; Koh, Je-Sung; Jung, Sunpill; Cho, Kyu-Jin</i>
10	10:04-10:07	Quasi-Static Manipulation of a Planar Elastic Rod Using Multiple Robotic Grippers <i>Mukadam, Mustafa; Borum, Andy; Bretl, Timothy</i>	Vision Based Robot Localization by Ground to Satellite Matching in GPS-Denied Situations <i>Viswanathan, Anirudh; Pires, Bernardo; Huber, Daniel</i>	Optimal Dynamic Force Mapping for Obstacle-Aided Locomotion in 2D Snake Robots <i>Holden, Christian; Stavdahl, Øyvind; Gravdahl, Jan Tommy</i>
11	10:07-10:10	Garment Perception and its Folding Using a Dual-arm Robot <i>Stria, Jan; Prusa, Daniel; Hlavac, Vaclav; Wagner, Libor; Petrik, Vladimir; Krsek, Pavel; Smutny, Vladimir</i>	Hybridization of Monte Carlo and Set-Membership Methods for the Global Localization of Underwater Robots <i>Neuland, Renata; Nicola, Jeremy; Maffei, Renan; Jaulin, Luc; Prestes, Edson; Kolberg, Mariana</i>	Empirical Investigation of Closed-Loop Control of Extensible Continuum Manipulators <i>Kapadia, Apoorva; Fry, Katelyn; Walker, Ian</i>

## Monday Session A, 09:20 - 10:40 (Continued)

		Grand Ballroom MoA1	State Ballroom MoA2	Red Lacquer Room MoA3
#	Time	Robust and Optimal Control	Motion and Path Planning I	Multi-Robot Coordination
12	10:10-10:13	Numerical Approximation for Visibility Based Pursuit Evasion Game <i>Bhattacharya, Sourabh; Basar, Tamer; Falcone, Maurizio</i>	A Novel RRT Extend Function for Efficient and Smooth Mobile Robot Motion Planning <i>Palmieri, Luigi; Arras, Kai Oliver</i>	Reactive Switching Protocols for Multi-Robot High-Level Tasks <i>Raman, Vasumathi</i>
13	10:13-10:16	Visibility-Based Motion Planning for Active Target Tracking and Localization <i>Wei, Hongchuan; Lu, Wenjie; Zhu, Pingping; Huang, Guoquan; Leonard, John; Ferrari, Silvia</i>	Guiding Sampling-Based Tree Search for Motion Planning with Dynamics Via Probabilistic Roadmap Abstractions <i>Le, Duong; Plaku, Erion</i>	Correlated Orienteering Problem and Its Application to Informative Path Planning for Persistent Monitoring Tasks <i>Yu, Jingjin; Schwager, Mac; Rus, Daniela</i>
14	10:16-10:19	Pursuit-Evasion Game for Normal Distributions <i>Jun, Chanyoung; Bhattacharya, Subhrajit; Ghrist, Robert</i>	Planning Agile Motions for Quadrotors in Constrained Environments <i>Boeuf, Alexandre; Cortes, Juan; Alami, Rachid; Simeon, Thierry</i>	Cooperative Control of a Heterogeneous Multi-Robot System based on Relative Localization <i>Cognetti, Marco; Oriolo, Giuseppe; Peliti, Pietro; Rosa, Lorenzo; Stegagno, Paolo</i>
15	10:19-10:22	Optimal control for robot-hand manipulation of an object using dynamic visual servoing <i>Jara, Carlos; Pomares, Jorge; Candelas Herías, Francisco Andrés; Torres, Fernando</i>	Optimal Navigation Functions for Nonlinear Stochastic Systems <i>Horowitz, Matanya; Burdick, Joel</i>	Three-Dimensional Multirobot Formation Control for Target Enclosing <i>Aranda, Miguel; Lopez-Nicolas, Gonzalo; Sagues, Carlos; Zavlanos, Michael M.</i>
16	10:22-10:25	Camera Control for Learning Nonlinear Target Dynamics Via Bayesian Nonparametric Dirichlet-Process Gaussian-Process (DP-GP) Models <i>Wei, Hongchuan; Lu, Wenjie; Zhu, Pingping; Ferrari, Silvia; Klein, Robert H; Omidshafiei, Shayegan; How, Jonathan Patrick</i>	A Lattice-Based Approach to Multi-Robot Motion Planning for Non-Holonomic Vehicles <i>Cirillo, Marcello; uras, tansel; Koenig, Sven</i>	Finding Optimal Routes for Multi-Robot Patrolling in Generic Graphs <i>Portugal, David; Pippin, Charles; Rocha, Rui P.; Christensen, Henrik Iskov</i>
17	10:25-10:28	Remote Operated Vehicle Tether Disturbances Analysis and Target Tracking Control <i>Huang, hai; sheng, ming-wei; Li, Yue-ming; Wan, Lei; Pang, Yongjie; di, wang</i>	Multi-Cost Robotic Motion Planning under Uncertainty <i>Simpson, Richard; Revell, James; Johansson, Anders; Richards, Arthur</i>	Fleet Size of Multi-Robot Systems for Exploration of Structured Environments <i>Cabrera-Mora, Flavio; Xiao, Jizhong</i>
18	10:28-10:31	Reactive Phase and Task Space Adaptation for Robust Motion Execution <i>Englert, Peter; Toussaint, Marc</i>	Constrained Path Optimization with Bezier Curve Primitives <i>Choi, Ji-wung; Huhtala, Kalevi</i>	Stable Formation of Groups of Robots Via Synchronization <i>Valbuena, Luis; Cruz, Patricio; Figueroa, Rafael; Sorrentino, Francesco; Fierro, Rafael</i>
19	10:31-10:34	Synchronization and Consensus of a Robot Network on an Underactuated Dynamic Platform <i>Nguyen, Kim Doang; Dankowicz, Harry</i>	Distance Metric Approximation for State-Space RRTs Using Supervised Learning <i>Bharatheesha, Mukunda; Caarls, Wouter; Wolfslag, Wouter; Wisse, Martijn</i>	The RoboCup 2013 Drop-In Player Challenges: Experiments in Ad Hoc Teamwork <i>MacAlpine, Patrick; Genter, Katie; Barrett, Samuel; Stone, Peter</i>
20	10:34-10:37	Robust Fixed Point Transformation Based Design for Model Reference Adaptive Control of a Modified TORA System <i>Tar, József Kázmér; Várkonyi, Teréz Anna; Kovács, Levente; Rudas, Imre J.; Haidegger, Tamas</i>	State Lattice with Controllers: Augmenting Lattice-Based Path Planning with Controller-Based Motion Primitives <i>Butzke, Jonathan; Sapkota, Krishna; Prasad, Kush; MacAllister, Brian; Likhachev, Maxim</i>	Aligning Coordinate Frames in Multi-Robot Systems with Relative Sensing Information <i>Nagavalli, Sasanka; Lybarger, Andrew; Luo, Lingzhi; Chakraborty, Nilanjan; Sycara, Katia</i>
21	10:37-10:40	Receding Horizon Optimization of Robot Motions Generated by Hierarchical Movement Primitives <i>Mühlig, Manuel; Hayashi, Akinobu; Gienger, Michael; Iba, Soshi; Yoshiike, Takahide</i>	Sponsor Talk: Motion Planning for Collaborative Robots <i>Barry, Jennifer</i> Rethink Robotics	A Mathematical Programming Approach to Collaborative Missions with Heterogeneous Teams <i>FEO, EDUARDO; Gambardella, Luca; Di Caro, Gianni A.</i>

## Monday Session B, 11:10 - 12:30

		Grand Ballroom MoB1 Calibration and Identification & Kinematics and Mechanism Design I	State Ballroom MoB2 Soft-Bodied Robotics & Robot Learning I	Red Lacquer Room MoB3 Navigation & Visual Servoing
Chair		Maciejewski, Anthony A. (Colorado State University)	Paik, Jamie (EPFL)	Hutchinson, Seth (University of Illinois)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	11:10-11:30	Keynote: Innovative Mechanical Systems to Address Current Robotics Challenges <i>Gosselin, Clement</i> Laval University	Keynote: Soft Robotics <i>Laschi, Cecilia</i> Scuola Superiore Sant'Anna di Pisa	Keynote: From Robotics to VR and Back <i>LaValle, Steven M</i> University of Illinois
		Calibration and Identification	Soft-Bodied Robotics	Navigation
2	11:30-11:33	Locally-Weighted Homographies for Calibration of Imaging Systems <i>Ranganathan, Pradeep; Olson, Edwin</i>	A New Coefficient-Adaptive Orthonormal Basis Function Model Structure for Identifying a Class of Pneumatic Soft Actuators <i>Wang, Xiaochen; Geng, Tao; Elsayed, Yahya; Ranzani, Tommaso; Saaj, Chakravarthini; Lekakou, Constantina</i>	Environment-Based Trajectory Clustering to Extract Principal Directions for Autonomous Vehicles <i>Tanzmeister, Georg; Wollherr, Dirk; Buss, Martin</i>
3	11:33-11:36	Towards Simultaneous Coordinate Calibrations for Cooperative Multiple Robots <i>Wang, Jiaole; Wu, Liao; Meng, Max Q.-H.; Ren, Hongliang</i>	Design of paper mechatronics: Towards a fully printed robot <i>Shigemune, Hiroki; Maeda, Shingo; Hara, Yusuke; Hashimoto, Shuji</i>	Wide-Field Optical Flow Aided Inertial Navigation for Unmanned Aerial Vehicles <i>Rhudy, Matthew; Chao, Haiyang; Gu, Yu</i>
4	11:36-11:39	Force Calibration of the the KUKA Lightweight Robot Including Embedded Joint Torque Sensors and Robot Structure <i>Gautier, Maxime; Jubien, Anthony</i>	Development of a Meal Assistive Exoskeleton Made of Soft Materials <i>Koo, Inwook; Yun, Chang-ho; Viana de Oliveira e Costa, Mateus; Scognamiglio, Joao; Yangali, Teodoro Andree; Park, Daeyeun; Cho, Kyu-Jin</i>	Experimental Study of Odometry Estimation Methods Using RGB-D Cameras <i>fang, zheng; Scherer, Sebastian</i>
5	11:39-11:42	Calibrating a Pair of Inertial Sensors at Opposite Ends of an Imperfect Kinematic Chain <i>Birbach, Oliver; Bäuml, Berthold</i>	Spatial Parallel Soft Robotic Architectures <i>Rivera, Jordan; Kim, Charles</i>	Precise Vision-Aided Aerial Navigation <i>Chiu, Han-Pang; Das, Aweek; Miller, Philip; Samarasekera, Supun; Kumar, Rakesh</i>
6	11:42-11:45	Extrinsic calibration of a set of range cameras in 5 seconds without any pattern <i>Fernández-Moral, Eduardo; González-Jiménez, Javier; Rives, Patrick; Arevalo, Vicente</i>	Whole Arm Planning for a Soft and Highly Compliant 2D Robotic Manipulator <i>Marchese, Andrew; Katschmann, Robert; Rus, Daniela</i>	Real-Time Autonomous 3D Navigation for Tracked Vehicles in Rescue Environments <i>Menna, Matteo; Gianni, Mario; Ferri, Federico; Pirri, Flora</i>
7	11:45-11:48	Extrinsic Calibration of Non-Overlapping Camera-Laser System Using Structured Environment <i>Bok, Yunsu; Choi, Dong - Geol; Vasseur, Pascal; Kweon, In So</i>	An Untethered Jumping Soft Robot <i>Tolley, Michael Thomas; Shepherd, Robert; Karpelson, Michael; Bartlett, Nicholas; Galloway, Kevin; Wehner, Michael; Nunes, Rui; Whitesides, George; Wood, Robert</i>	Interactive Navigation of Humans from a Game Theoretic Perspective <i>Turnwald, Annemarie; Olszowy, Wiktor; Wollherr, Dirk; Buss, Martin</i>
8	11:48-11:51	Magnetometer Bias Calibration Based on Relative Angular Position: Theory and Experimental Comparative Evaluation <i>Troni, Giancarlo; Eustice, Ryan</i>	Motion Pattern Discrimination for Soft Robots with Morphologically Flexible Sensors <i>Culha, Utku; Wani, Umar; Nurzaman, Surya G.; Clemens, Frank; Iida, Fumiya</i>	Layered Costmaps for Context-Sensitive Navigation <i>Lu, David V.; Hershberger, Dave; Smart, William</i>
9	11:51-11:54	Automatic Calibration of RGBD and Thermal Cameras <i>Lussier, Jake; Thrun, Sebastian</i>	An Active Compliant Control Mode for Interaction with a Pneumatic Soft Robot <i>Queisser, Jeffrey; Neumann, Klaus; Rolf, Matthias; Reinhart, Rene Felix; Steil, Jochen J.</i>	Omnidirectional 3D Reconstruction in Augmented Manhattan Worlds <i>Schönbein, Miriam; Geiger, Andreas</i>
10	11:54-11:57	Spatio-Temporal Laser to Visual/Inertial Calibration with Applications to Hand-Held, Large Scale Scanning <i>Rehder, Joern; Furgale, Paul Timothy; Beardsley, Paul; Siegwart, Roland</i>	Conformable Actuation and Sensing with Robotic Fabric <i>Yuen, Michelle; Cherian, Arun; Case, Jennifer; Seipel, Justin; Kramer, Rebecca</i>	Semantic Mapping for Object Category and Structural Class <i>Zhao, Zhe; Chen, Xiaoping</i>
11	11:57-12:00	A Catadioptric Extension for RGB-D Cameras <i>Endres, Felix; Sprunk, Christoph; Kuemmerle, Rainer; Burgard, Wolfram</i>	Kinematics of a New Class of Smart Actuators for Soft Robots Based on Generalized Pneumatic Artificial Muscles <i>Krishnan, Girish</i>	Anytime Navigation with Progressive Hindsight Optimization <i>Godoy, Julio; Karamouzas, Ioannis; Guy, Stephen J.; Gini, Maria</i>



## Monday Session B, 11:10 - 12:30 (Continued)

		Grand Ballroom MoB1	State Ballroom MoB2	Red Lacquer Room MoB3
#	Time	Kinematics and Mechanism Design I	Robot Learning I	Visual Servoing
12	12:00-12:03	A Dual-Motor Robot Joint Mechanism with Epicyclic Gear Train <i>Babin, Vincent; Gosselin, Clement; Allan, Jean-Francois</i>	Unsupervised and Online Non-Stationary Obstacle Discovery and Modeling Using a Laser Range Finder <i>Duceux, Guillaume; Filliat, David</i>	6D Image-Based Visual Servoing for Robot Manipulators with uncalibrated Stereo Cameras <i>Cai, Caixia; Dean Leon, Emmanuel; Somani, Nikhil; Knoll, Alois</i>
13	12:03-12:06	Kinematic Design and Analysis for a Macaque Upper-Limb Exoskeleton with Shoulder Joint Alignment <i>Haninger, Kevin; Lu, Junkai; Chen, Wenjie; Tomizuka, Masayoshi</i>	Mutual Learning of an Object Concept and Language Model Based on MLDA and NPYLM <i>Nakamura, Tomoaki; Nagai, Takayuki; Funakoshi, Kotaro; Nagasaka, Shogo; Taniguchi, Tadaihiro; Iwahashi, Naoto</i>	Weakly Calibrated Stereoscopic Visual Servoing for Laser Steering: Application to Microphonosurgery <i>TAMADAZTE, Brahim; Andreff, Nicolas</i>
14	12:06-12:09	An Alternative Approach to Robot Safety <i>Parmiggiani, Alberto; Randazzo, Marco; Natale, Lorenzo; Metta, Giorgio</i>	Object Manifold Learning with Action Features for Active Tactile Object Recognition <i>Tanaka, Daisuke; Matsubara, Takamitsu; Ichien, Kentaro; Sugimoto, Kenji</i>	Novel Two-Stage Control Scheme for Robust Constrained Visual Servoing <i>Assa, Akbar; Janabi-Sharifi, Farrokh</i>
15	12:09-12:12	On the Performance Evaluation and Analysis of General Robots with Mixed DoFs <i>SHAYYA, Samah; Krut, Sebastien; Company, Olivier; Baradat, Cédric; Pierrot, François</i>	Entropy Based Strategies for Physical Exploration of the Environment's Degrees of Freedom <i>Otte, Stefan; Kulick, Johannes; Toussaint, Marc; Brock, Oliver</i>	Lyapunov-Stable Eye-In-Hand Kinematic Visual Servoing with Unstructured Static Feature Points <i>Navarro-Alarcon, David; Liu, Yunhui</i>
16	12:12-12:15	Closed-Loop Inverse Kinematics under Inequality Constraints: Application to Concentric-Tube Manipulators <i>Azimian, Hamidreza; Looi, Thomas; Drake, James</i>	Knowledge Propagation and Relation Learning for Predicting Action Effects <i>Szedmak, Sandor; Ugur, Emre; Piater, Justus</i>	A Sequence of Micro-Assembly for Irregular Objects Based on a Multiple Manipulator Platform <i>Xing, Dengpeng; Xu, De; Li, Hai peng</i>
17	12:15-12:18	Novel Three-DOF Ankle Mechanisms for Lower-Limb Exoskeleton: Kinematic Analysis and Design of Passive-Type Ankle Module <i>Hong, Man Bok; Shin, Young June; Wang, Ji-Hyeun</i>	Learning to Reach into the Unknown: Selecting Initial Conditions When Reaching in Clutter <i>PARK, DAEHYUNG; Kapusta, Ariel; Kim, You Keun; Rehg, James; Kemp, Charlie</i>	Visual Servoing Based Trajectory Tracking of Underactuated Water Surface Robots without Direct Position Measurement <i>WANG, Kai; Liu, Yunhui; Li, Luyang</i>
18	12:18-12:21	Robust Solution of Prioritized Inverse Kinematics Based on Hestenes-Powell Multiplier Method <i>Sugihara, Tomomichi</i>	Learning Haptic Representation for Manipulating Deformable Food Objects <i>Gemici, Mevlana Celeleddin; Saxena, Ashutosh</i>	Image Jacobian Estimation Using Structure from Motion on a Centralized Point <i>Nevarez, Victor; Lumia, Ron</i>
19	12:21-12:24	Analytical Inverse Kinematic Solution for Modularized 7-DoF Redundant Manipulators with Offsets at Shoulder and Wrist <i>Luo, Ren; Lin, Tsung-Wei; Tsai, Yun-Hsuan</i>	A Neural Dynamics Architecture for Grasping That Integrates Perception and Movement Generation and Enables On-Line Updating <i>Knips, Guido; Zibner, Stephan Klaus Ulrich; Reimann, Hendrik; Popova, Irina; Schöner, Gregor</i>	Vision Guided Robotic Block Stacking <i>Macias, Nate; Wen, John</i>
20	12:24-12:27	A Flexible and Robust Robotic Arm Design and Skill Learning by Using Recurrent Neural Networks <i>Tan, Boon Hwa; Tang, Huajin; Yan, Rui; Tani, Jun</i>	Control in the Reliable Region of a Statistical Model with Gaussian Process Regression <i>Yun, Youngmok; Deshpande, Ashish</i>	A Two Phase RGB-D Visual Servoing Controller <i>Hojaj, Abdullah; Zelek, John S.; Asmar, Daniel</i>
21	12:27-12:30	Sponsor Talk: The da Vinci Xi Surgical System <i>DiMajo, Simon P. Intuitive Surgical</i>	Confidence-Based Roadmap Using Gaussian Process Regression for a Robot Control <i>Okadome, Yuya; Nakamura, Yutaka; URAI, Kenji; Nakata, Yoshihiro; Ishiguro, Hiroshi</i>	Pose Error Correction For Visual Features Prediction <i>Cazy, Nicolas; Dune, Claire; Wieber, Pierre-Brice; Robuffo Giordano, Paolo; Chaumette, Francois</i>

## Monday Session C, 13:50 - 15:10

		Grand Ballroom MoC1 Micro-Nano Robots I & Manipulation and Grasping II	State Ballroom MoC2 Humanoids and Bipeds I & Computer Vision I	Red Lacquer Room MoC3 Bioinspired Robots II & Distributed Robotics
	Chair	Brock, Oliver (TU Berlin)	Dillmann, Rüdiger (Karlsruhe Institute of Technology)	Hsieh, M. Ani (Drexel University)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	13:50-14:10	Keynote: Micro and Nano Robotics for Biomedical Innovations <i>Arai, Fumihito</i> Nagoya University	Keynote: What is a humanoid robot good for? <i>Yokoi, Kazuhito</i> AIST	Keynote: From Biology to Robot and Back <i>Choset, Howie</i> Carnegie Mellon University
		Micro-Nano Robots I	Humanoids and Bipeds I	Bioinspired Robots II
2	14:10-14:13	Three Dimensional Multi-Cell Spheroids Assembly Using Thermoresponsive Gel Probe <i>Takeuchi, Masaru; Nakajima, Masahiro; Fukuda, Toshio; Hasegawa, Yasuhisa</i>	Identification of HRP-2 Foot's Dynamics <i>Mikami, Yuya; Moulard, Thomas; Yoshida, Eiichi; Venture, Gentiane</i>	Compliance Computation for Continuum Types of Robots <i>Smoljkic, Gabrijel; Reynaerts, Dominiek; Vander Sloten, Jos; Vander Poorten, Emmanuel B</i>
3	14:13-14:16	Construction of Vascular-like Microtubes via Fluidic Axis-translation Self-assembly based on Multiple Hydrogels <i>Yue, Tao; Nakajima, Masahiro; Takeuchi, Masaru; Huang, Qiang; Fukuda, Toshio</i>	Integration of Non-Inclusive Contacts in Posture Generation <i>Brossette, Stanislas; Escande, Adrien; Vaillant, Joris; Keith, François; Moulard, Thomas; Kheddar, Abderrahmane</i>	Multiport Modeling of Force and Displacement in Elastic Transmissions for Underactuated Hands <i>Martell, Michael; Schultz, Joshua</i>
4	14:16-14:19	Magnetic Actuation of Ultra-Compliant Micro Robotic Mechanisms <i>Vogtmann, Dana; Bergbreiter, Sarah</i>	3D Dynamics of Bipedal Running: Effects of Step Width on an Amputee-Inspired Robot <i>Sullivan, Timothy; Seipel, Justin</i>	iSplash-II: Realizing Fast Carangiform Swimming to Outperform a Real Fish <i>Clapham, Richard James; Hu, Huosheng</i>
5	14:19-14:22	Selective and Rapid Cell Injection of Fluorescence Sensor Encapsulated in Liposome Using Optical Control of Zeta Potential and Local Vibration Stimulus by Optical Tweezers <i>Maruyama, Hisataka; Masuda, Taisuke; Ryu, heng jun; Arai, Fumihito</i>	Lyapunov Stability Margins for Humanoid Robot Balancing <i>Spyrakos-Papastavridis, Emmanouil; Perrin, Nicolas Yves; Tsagarakis, Nikolaos; Dai, Jian; Caldwell, Darwin G.</i>	Multi-Functional Bio-Inspired Leg for Underwater Robots <i>Kim, Hee Joong; Jun, Bong Huan; Lee, Jihong</i>
6	14:22-14:25	Real-Time LOC-based Morphological Cell Analysis System Using High-Speed Vision <i>Gu, Qingyi; Aoyama, Tadayoshi; Takaki, Takeshi; Ishii, Idaku; Takemoto, Ayumi; Sakamoto, Naoaki</i>	State Estimation for a Humanoid Robot <i>Rotella, Nicholas; Bloesch, Michael; Righetti, Ludovic; Schaal, Stefan</i>	Torque Control Strategies for Snake Robots <i>Rollinson, David; Alwala, Kalyan Vasudev; Zevallos, Nico; Choset, Howie</i>
7	14:25-14:28	Noncontact Fine Alignment for Multiple Microcontact Printing <i>Tanaka, Nobuyuki; Ota, Hiroki; Fukumori, Kazuhiro; Yamato, Masayuki; Okano, Teruo; Miyake, Jun</i>	Sideward Locomotion Control of Biped Robots Based on Dynamics Morphing <i>Atsuta, Hiroshi; Sugihara, Tomomichi</i>	A 3D Motion Planning Framework for Snake Robots <i>Liljebäck, Pål; Pettersen, Kristin Y.; Stavdahl, Øyvind; Gravidahl, Jan Tommy</i>
8	14:28-14:31	Study on Rotational and Unclogging Motions of Magnetic Chain-Like Microrobot <i>Belharet, Karim; Folio, David; Ferreira, Antoine</i>	Modular Low-Cost Humanoid Platform for Disaster Response <i>Yi, Seung-Joon; McGill, Stephen; Vadakedathu, Larry; He, Qin; Ha, Inyong; Rouleau, Michael; Hong, Dennis; Lee, Daniel D.</i>	Human Control of Robot Swarms with Dynamic Leaders <i>Walker, Phillip; Amirpour Amraii, Saman; Lewis, Michael; Chakraborty, Nilanjan; Sycara, Katia</i>
9	14:31-14:34	Development of Chemical Stimulation System for Local Environment Control by Using Combination of Spout and Suction from Dual Pipettes <i>Motoyoshi, Takahiro; Kojima, Masaru; Ohara, Kenichi; Horade, Mitsuhiro; Kamiyama, Kazuto; Mae, Yasushi; Arai, Tatsuo</i>	Perception and Control Strategies for Driving Utility Vehicles with a Humanoid Robot <i>Rasmussen, Christopher; Sohn, Kiwon; Wang, Qiaosong; Oh, Paul Y.</i>	Snakes on an Inclined Plane: Learning an Adaptive Sidewinding Motion for Changing Slopes <i>Gong, Chaohui; Tesch, Matthew; Rollinson, David; Choset, Howie</i>
10	14:34-14:37	A Stick-Slip Omnidirectional Powertrain for Low-Cost Swarm Robotics: Mechanism, Calibration, and Control <i>Klingner, John; Kanakia, Anshul; Farrow, Nicholas; Reishus, Dustin; Correll, Nikolaus</i>	Balancing experiments on a torque-controlled humanoid with hierarchical inverse dynamics <i>Herzog, Alexander; Righetti, Ludovic; Grimminger, Felix; Pastor, Peter; Schaal, Stefan</i>	Flapping Actuator Inspired by Lepidotrichia of Ray-Finned Fishes <i>Sekar, Karthik Srivatsa; Triantafyllou, Michael; Valdivia y Alvarado, Pablo</i>
11	14:37-14:40	Non-Vector Space Stochastic Control for Nano Robotic Manipulations <i>Zhao, Jianguo; Song, Bo; Xi, Ning</i>	Dynamic State Estimation Using Quadratic Programming <i>Xinjilefu, X; Feng, Siyuan; Atkeson, Christopher</i>	Design and Implementation of a Low Cost, Pump-Based, Depth Control of a Small Robotic Fish <i>Makrodimitris, Michail; Aliprantis, Ioannis; Papadopoulos, Evangelos</i>

## Monday Session C, 13:50 - 15:10 (Continued)

		Grand Ballroom MoC1	State Ballroom MoC2	Red Lacquer Room MoC3
#	Time	Manipulation and Grasping II	Computer Vision I	Distributed Robotics
12	14:40-14:43	Task Specific Robust Grasping for Multifingered Robot Hands <i>Boutselis, George; Bechlioulis, Charalampos; Liarokapis, Minas; Kyriakopoulos, Kostas</i>	"Look at This!" Learning to Guide Visual Saliency in Human-Robot Interaction <i>Schauerte, Boris; Stiefelbogen, Rainer</i>	Distributed Management and Representation of Data and Context in Robotic Applications <i>Dietrich, André; Zug, Sebastian; Mohammad, Siba; Kaiser, Jörg</i>
13	14:43-14:46	Achieving Elastic Stability of Concentric Tube Robots through Optimization of Tube Precurvature <i>Ha, Junhyoung; Park, Frank; Dupont, Pierre</i>	SuperFAST: Model-Based Adaptive Corner Detection for Scalable Robotic Vision <i>Florentz, Gaspard; Aldea, Emanuel</i>	Environment-independent Formation Flight for Micro Aerial Vehicles <i>Naegeli, Tobias; Conte, Christian; domahidi, alexander; Morari, Manfred; Hilliges, Otmar</i>
14	14:46-14:49	Cable Stiffened Flexible Link Manipulator <i>Dixit, Rahul; Kumar, R Prasanth</i>	Auto-Adjusting Camera Exposure for Outdoor Robotics Using Gradient Information <i>Shim, Inwook; Lee, Joon-Young; Kweon, In So</i>	Rapid Multirobot Deployment with Time Constraints <i>Carpin, Stefano; Pavone, Marco; Sadler, Brian</i>
15	14:49-14:52	Robotic Handwriting: Multi-Contact Manipulation Based on Reactional Internal Contact Hypothesis <i>Kim, Sung-Kyun; Jo, Joonhee; Oh, Yonghwan; Oh, Sang-Rok; Srinivasa, Siddhartha; Likhachev, Maxim</i>	SLAM with Object Discovery, Modeling and Mapping <i>Choudhary, Siddharth; Trevor, Alexander J B; Christensen, Henrik Iskov; Dellaert, Frank</i>	A Distributed Optimal Strategy for Rendezvous of Multi-Robots with Random Node Failures <i>Park, Hyongju; Hutchinson, Seth</i>
16	14:52-14:55	Cooperative Suspended Object Manipulation Using Reinforcement Learning and Energy-Based Control <i>Palunko, Ivana; Donner, Philine; Buss, Martin; Hirche, Sandra</i>	Real-Time Sequential Model-Based Non-Rigid SFM <i>Bronte, Sebastian; Paladini, Marco; Bergasa, Luis Miguel; Agapito, Lourdes; Arroyo, Roberto</i>	Distributed Cohesive Configuration Control for Swarm Robots with Boundary Information and Network Sensing <i>Lee, Seoung Kyou; McLurkin, James</i>
17	14:55-14:58	Robotic Dual Probe Setup for Reliable Pick and Place Processing on the Nanoscale Using Haptic Devices <i>Tiemerding, Tobias; Zimmermann, Soeren; Fatikow, Sergej</i>	Direct Superpixel Labeling for Mobile Robot Navigation Using Learned General Optical Flow Templates <i>Roberts, Richard; Dellaert, Frank</i>	Decentralized and Complete Multi-Robot Motion Planning in Confined Spaces <i>Wiktor, Adam; Scobee, Dexter; Messenger, Sean; Clark, Christopher M.</i>
18	14:58-15:01	Optimal Parameter Identification for Discrete Mechanical Systems with Application to Flexible Object Manipulation <i>Caldwell, Timothy; Coleman, David; Correll, Nikolaus</i>	A Directional Visual Descriptor for Large-Scale Coverage Problems <i>Tamassia, Marco; Farinelli, Alessandro; Murino, Vittorio; Del Bue, Alessio</i>	Mobile Robotic Wireless Sensor Networks for Efficient Spatial Prediction <i>Nguyen, Linh Van; Kodagoda, Sarath; Ranasinghe, Ravindra; Dissanayake, Gamini</i>
19	15:01-15:04	The Joint Coordination in Reach-To-Grasp Movements <i>Li, Zhi; Gray, Kierstin; Roldan, Jay Ryan; Milutinovic, Dejan; Rosen, Jacob</i>	Real-Time Pose Estimation of Deformable Objects Using a Volumetric Approach <i>Li, Yinxiao; Wang, Yan; Case, Michael; Chang, Shih-Fu; Allen, Peter</i>	Improving Data Ferrying by Iteratively Learning the Radio Frequency Environment <i>Carfang, Anthony; Wagle, Neeti; Frew, Eric W.</i>
20	15:04-15:07	A Robot System Design for Low-Cost Multi-Robot Manipulation <i>McLurkin, James; McMullen, Adam; Robbins, Nicholas; Habibi, Golnaz; Becker, Aaron; Chou, Alvin; Li, Hao; John, Meagan; Okeke, Nnena; Rykowski, Joshua; Kim, Sunny; Xie, William; Taylor, Vaughn; Zhou, Yu; Shen, Hsin-Yu Jennifer; Chen, Nelson; Kaseman, Quillan; Langford, Lindsay; Hunt, Jeremy; Boone, Amanda; Koch, Kevin Koch</i>	PAS: Visual Odometry with Perspective Alignment Search <i>Richardson, Andrew; Olson, Edwin</i>	A Cooperative Formation Control Strategy Maintaining Connectivity of a Multi-Agent System <i>Dutta, Rajdeep; Sun, Liang; Kothari, Mangal; Sharma, Rajnikant; Pack, Daniel</i>
21	15:07-15:10	Declarative Specification of Task-Based Grasping with Constraint Validation <i>Schneider, Sven; Hochgeschwender, Nico; Kraetzschmar, Gerhard</i>	Planar Building Facade Segmentation and Mapping Using Appearance and Geometric Constraints <i>Lee, Joseph; Lu, Yan; Song, Dezhen</i>	Interactive Augmented Reality for Understanding and Analyzing Multi-Robot Systems <i>Ghiringhelli, Fabrizio; Guzzi, Jerome; Di Caro, Gianni A.; caglioti, vincenzo; Gambardella, Luca; Giusti, Alessandro</i>

## Monday Session D, 15:20 - 16:40

		Grand Ballroom MoD1 Haptics & Surgical Robotics I	State Ballroom MoD2 Human-Robot Interaction I & Robot Learning II	Red Lacquer Room MoD3 Formal Methods & Software and Architecture
	Chair	Xiao, Jing (UNC-Charlotte)	De Luca, Alessandro (Sapienza University of Rome)	Tumova, Jana (Royal Institute of Technology)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	15:20-15:40	Keynote: Haptics in Robot-Assisted Surgery <i>Okamura, Allison M.</i> Stanford University	Keynote: Overview of Motor Interaction with Robots and Other Humans <i>Burdet, Etienne</i> Imperial College London	Keynote: Formal methods in robotics <i>Pappas, George J.</i> University of Pennsylvania
		Haptics	Human-Robot Interaction I	Formal Methods
2	15:40-15:43	Steering of Flexible Needles Combining Kinesthetic and Vibratory Force Feedback <i>Pacchierotti, Claudio; Abayazid, Momen; Misra, Sarthak; Prattichizzo, Domenico</i>	A Peer Pressure Experiment: Recreation of the Asch Conformity Experiment with Robots <i>Brandstetter, Jürgen; Racz, Peter; Beckner, Clayton; Sandoval, Eduardo; Hay, Jennifer; Bartneck, Christoph</i>	A Compositional Approach to Stochastic Optimal Control with Co-safe Temporal Logic Specifications <i>Horowitz, Matanya; Wolff, Eric; Murray, Richard</i>
3	15:43-15:46	Touch Attention Bayesian Models for Robotic Active Haptic Exploration of Heterogeneous Surfaces <i>Martins, Ricardo; Ferreira, João Filipe; Dias, Jorge</i>	Inverse Reinforcement Learning Algorithms and Features for Robot Navigation in Crowds: An Experimental Comparison <i>Vasquez, Dizan; Okal, Billy; Arras, Kai Oliver</i>	Formal Verification of Maneuver Automata for Parameterized Motion Primitives <i>Heß, Daniel; Althoff, Matthias; Sattel, Thomas</i>
4	15:46-15:49	Design and Evaluation of a 1DoF ERF-Based Needle Insertion Haptic Platform <i>Graña Sanchez, Adrian; Sanchez Secades, Luis Alonso; Zemití, Nabil; Poignet, Philippe</i>	Extraction of Person-Specific Motion Style Based on a Task Model and Imitation by Humanoid Robot <i>Okamoto, Takahiro; Shiratori, Takaaki; Glisson, Matthew; Yamane, Katsu; Kudoh, Shunsuke; Ikeuchi, Katsushi</i>	How Behavior Trees Modularize Robustness and Safety in Hybrid Systems <i>Colledanchise, Michele; Ogren, Petter</i>
5	15:49-15:52	Haptic-Enabled Teleoperation of Base-Excited Hydraulic Manipulators Applied to Live-Line Maintenance <i>Banthia, Vikram; Maddahi, Yaser; Balakrishnan, Subramaniam; Sepehri, Nariman</i>	Determining Proper Grasp Configurations for Handovers through Observation of Object Movement Patterns and Inter-Object Interactions During Usage <i>Chan, Wesley Patrick; Kakiuchi, Yohei; Okada, Kei; Inaba, Masayuki</i>	Verification and Testing of Mobile Robot Navigation Algorithms: A Case Study in SPARK <i>Trojaneck, Piotr; Eder, Kerstin</i>
6	15:52-15:55	A Mixed-Initiative Control System for an Aerial Service Vehicle Supported by Force Feedback <i>Cacace, Jonathan; Finzi, Alberto; Lippiello, Vincenzo</i>	Using Spatial Language to Drive a Robot for an Indoor Environment Fetch Task <i>Huo, Zhiyu; Alexenko, Tatiana; Skubic, Marjorie</i>	Verifying and Validating Multirobot Missions <i>Lyons, Damian; Arkin, Ronald; Jiang, Shu; Harrington, Dagan; Liu, Tsung-Ming</i>
7	15:55-15:58	Design of a Bladder Based Elastomeric Smart Shoe for Haptic Terrain Display <i>Wang, Yue; Minor, Mark</i>	Speech-Based Human-Robot Interaction Robust to Acoustic Reflections in Real Environment <i>Gomez, Randy; Inoue, Koji; Nakamura, Keisuke; Mizumoto, Takeshi; Nakadai, Kazuhiro</i>	Maximally Satisfying LTL Action Planning <i>Tumova, Jana; Marzinotto, Alejandro; Dimarogonas, Dimos V.; Kragic, Danica</i>
8	15:58-16:01	Contact Force Decomposition Using Tactile Information for Haptic Augmented Reality <i>Kim, Hyoungkyun; Choi, Seungmoon; Chung, Wan Kyun</i>	Head-Eyes System and Gaze Analysis of the Humanoid Robot Romeo <i>Pateromichelakis, Nikolaos; Mazel, Alexandre; Hache, Marc-Antoine; KOUPOGIANNIS, Thomas; Gelin, Rodolphe; MAISONNIER, Bruno; Berthoz, Alain</i>	Optimal and Dynamic Planning for Markov Decision Processes with Co-Safe LTL Specifications <i>Lacerda, Bruno; Parker, David; Hawes, Nick</i>
9	16:01-16:04	RoboPuppet: Low-Cost, 3D Printed Miniatures for Teleoperating Full-Size Robots <i>Eilering, Anna; Franchi, Giulia; Hauser, Kris</i>	Development of a Rehabilitation Robot Suit with Velocity and Torque-Based Mechanical Safety Devices <i>Kai, Yoshihiro; KITAGUCHI, Satoshi; Kanno, Shotaro; Zhang, Wenlong; Tomizuka, Masayoshi</i>	SafeRobots: A Model-Driven Framework for Developing Robotic Systems <i>Ramaswamy, Arunkumar; Monsuez, Bruno; Tapus, Adriana</i>
10	16:04-16:07	Haptic Exploration of Unknown Surfaces with Discontinuities <i>Jamisola, Jr., Rodrigo S.; Kormushev, Petar; Bicchi, Antonio; Caldwell, Darwin G.</i>	Modeling and Controller Design of Cooperative Robots in Workspace Sharing Human-Robot Assembly Teams <i>Liu, Changliu; Tomizuka, Masayoshi</i>	Automated Composition of Motion Primitives for Multi-Robot Systems from Safe LTL Specifications <i>Saha, Indranil; Ramaitithima, Rattanachai; Kumar, Vijay; Pappas, George J.; Seshia, Sanjit A.</i>
11	16:07-16:10	The Patched Intrinsic Tactile Object: A Tool to Investigate Human Grasps <i>Serio, Alessandro; Riccomini, Emanuele; Tartaglia, Vincenzo; Sarakoglou, Ioannis; Gabiccini, Marco; Tsagarakis, Nikolaos; Bicchi, Antonio</i>	Adjutant: A Framework for Flexible Human-Machine Collaborative Systems <i>Guerin, Kelleher; Riedel, Sebastian Danilo; Bohren, Jonathan; Hager, Gregory</i>	A Stable Switched-System Approach to Obstacle Avoidance for Mobile Robots in SE(2) <i>Jin, JingFu; Green, Adrian; Gans, Nicholas (Nick)</i>

## Monday Session D, 15:20 - 16:40 (Continued)

		Grand Ballroom MoD1	State Ballroom MoD2	Red Lacquer Room MoD3
#	Time	Surgical Robotics I	Robot Learning II	Software and Architecture
12	16:10-16:13	Workspace Characterization for Concentric Tube Continuum Robots <i>Burgner-Kahrs, Jessica; Gilbert, Hunter B.; Granna, Josephine; Swaney, Philip J.; Webster III, Robert James</i>	Efficient Policy Search with a Parameterized Skill Memory <i>Reinhart, Rene Felix; Steil, Jochen J.</i>	Etas/etc: A Constraint-Based Task Specification Language and Robot Controller Using Expression Graphs <i>Aertbelien, Erwin; De Schutter, Joris</i>
13	16:13-16:16	Preliminary Evaluation of a New Microsurgical Robotic System for Head and Neck Surgery <i>Olds, Kevin; Chalasani, Preeham; Pacheco-Lopez, Paulette; Iordachita, Iulian; Akst, Lee; Taylor, Russell H.</i>	Simultaneous On-Line Discovery and Improvement of Robotic Skill Options <i>Stulp, Freek; Herlant, Laura; Hoarau, Antoine; Raiola, Gennaro</i>	Robot Task Commander: A Framework and IDE for Robot Application Development <i>Hart, Stephen; Dinh, Paul; Yamokoski, John; Wightman, Brian; Radford, Nicolaus</i>
14	16:16-16:19	Surgical Structured Light for 3D Minimally Invasive Surgical Imaging <i>Reiter, Austin; Sigaras, Alexandros; Fowler, Dennis; Allen, Peter</i>	Dimensionality Reduction and Motion Coordination in Learning Trajectories with Dynamic Movement Primitives <i>Colomé, Adrià; Torras, Carme</i>	Enhancing Software Module Reusability Using Port Plug-Ins: An Experiment with the iCub Robot <i>Paikan, Ali; Tikhanoff, Vadim; Metta, Giorgio; Natale, Lorenzo</i>
15	16:19-16:22	Cooperative Teleoperation with Projection-Based Force Reflection for MIS <i>Takhmar, Amir; Polushin, Ilya G.; Talasaz, Ali; Patel, Rajnikant V.</i>	OrigamiBot-I: A Thread-Actuated Origami Robot for Manipulation and Locomotion <i>Vander Hoff, Evan; Jeong, Donghwa; Lee, Kiju</i>	Simple Concurrency for Robotics with the Roboscoop Framework <i>Rusakov, Andrey; Shin, Jiwon; Meyer, Bertrand</i>
16	16:22-16:25	Design of a Unified Active Locomotion Mechanism for a Wireless Laparoscopic Camera System <i>Liu, Xiaolong; Mancini, Gregory; Tan, Jindong</i>	Decoding Surface Electromyogram into Dynamic State to Extract Dynamic Motor Control Strategy of Human <i>Park, Seongsik; Chung, Wan Kyun</i>	A Lightweight, Cross-Platform, Multiuser Robot Visualization Using the Cloud <i>Hilton, William; Lofaro, Daniel; Kim, Youngmoo</i>
17	16:25-16:28	Toward Automated Intraocular Laser Surgery Using a Handheld Micromanipulator <i>Yang, Sungwook; MacLachlan, Robert A.; Riviere, Cameron N.</i>	Latent Space Policy Search for Robotics <i>Luck, Kevin Sebastian; Neumann, Gerhard; Berger, Erik; Peters, Jan; Ben Amor, Henri</i>	ReFrESH: A Self-Adaptation Framework to Support Fault Tolerance in Field Mobile Robots <i>Cui, Yanzhe; Voyles, Richard; Lane, Joshua; Mahoor, Mohammad</i>
18	16:28-16:31	Quasi-Static Modeling of the Da Vinci Instrument <i>Anooshahpour, Farshad; Polushin, Ilya G.; Patel, Rajnikant V.</i>	Learning of Closed-Loop Motion Control <i>Farshidian, Farbod; Neunert, Michael; Buchli, Jonas</i>	Speeding up Rao-Blackwellized Particle Filter SLAM with a Multithreaded Architecture <i>Gouveia, Bruno; Portugal, David; Marques, Lino</i>
19	16:31-16:34	Design and Evaluation of a Novel Flexible Robot for Transluminal and Endoluminal Surgery <i>Seneci, Carlo Alberto; Shang, Jianzhong; Leibrandt, Konrad; Vitiello, Valentina; Patel, Nisha; Darzi, Ara; Teare, Julian; Yang, Guang-Zhong</i>	Unsupervised Learning Approach to Attention-Path Planning for Large-Scale Environment Classification <i>LEE, Hosun; Jeong, Sungmoon; Chong, Nak Young</i>	Developing Virtual Testbeds for Intelligent Robot Manipulators - an Erobotics Approach <i>Guiffo Kaigom, Eric; Rossmann, Juergen</i>
20	16:34-16:37	Design of a Spine-Inspired Kinematic for the Guidance of Flexible Instruments in Minimally Invasive Surgery <i>Traeger, Mattias Felix; Roppenecker, Daniel B.; Leininger, Matthias R.; Schnoes, Florian; Lueth, Tim C.</i>	Automatic Channel Selection and Neural Signal Estimation across Channels of Neural Probes <i>Vysotska, Olga; Frank, Barbara; Istvan, Ulbert; Paul, Oliver; Ruther, Patrick; Stachniss, Cyrill; Burgard, Wolfram</i>	Crowdsourcing As a Methodology to Obtain Large and Varied Robotic Data Sets <i>de Croon, Guido; Gerke, Paul; Sprinkhuizen-Kuyper, Ida</i>
21	16:37-16:40	Hybrid Control of Master-Slave Velocity Control and Admittance Control for Safe Remote Surgery <i>Osa, Takayuki; Uchida, Satoshi; Sugita, Naohiko; Mitsuishi, Mamoru</i>	Fast Planning of Well Conditioned Trajectories for Model Learning <i>Wang, Cong; Zhao, Yu; Lin, Chung-Yen; Tomizuka, Masayoshi</i>	

## Tuesday Session A, 09:00 - 10:20

		Grand Ballroom TuA1 Manipulation and Grasping III & Parallel Robotics	State Ballroom TuA2 Motion and Path Planning II & Localization and Mapping II	Red Lacquer Room TuA3 Search, Rescue, and Audition & Field Robotics
Chair	Guglielmelli, Eugenio (Universita' Campus Bio-Medico)		LaValle, Steven M (University of Illinois)	Tadokoro, Satoshi (Tohoku University)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	09:00-09:20	Keynote: Grasping and Manipulation by Humans and by Robots <i>Brock, Oliver</i> TU Berlin	Keynote: Sampling-Based Planning: Foundations & Applications <i>Amato, Nancy</i> Texas A&M	Keynote: Lessons Learned in Field Robotics from Disasters <i>Murphy, Robin</i> Texas A&M
		Manipulation and Grasping III	Motion and Path Planning II	Search, Rescue, and Audition
2	09:20-09:23	Characterization of the Precision Manipulation Capabilities of Robot Hands via the Continuous Group of Displacements <i>Rojas, Nicolas; Dollar, Aaron</i>	Proactive Kinodynamic Planning using the Extended Social Force Model and Human Motion Prediction in Urban Environments <i>Ferrer, Gonzalo; Sanfeliu, Alberto</i>	The Response Robotics Summer School 2013: Bringing Responders and Researchers Together to Advance Response Robotics <i>Sheh, Raymond Ka-Man; Collidge, Bill; Lazarescu, Mihai; Komsuoglu, Haldun; Jacoff, Adam</i>
3	09:23-09:26	Encoderless Robot Motion Control Using Vision Sensor and Back Electromotive Force <i>Kawamura, Akihiro; Tachibana, Miyako; Yamate, Soichiro; Kawamura, Sadao</i>	An Automatic Approach for the Generation of the Roadmap for Multi-AGV Systems in an Industrial Environment <i>Digani, Valerio; Sabattini, Lorenzo; Secchi, Cristian; Fantuzzi, Cesare</i>	Design of a Hybrid Exploration Robot for Air and Land Deployment (H.E.R.A.L.D) for Urban Search and Rescue Applications <i>Latscha, Stella; Kofron, Michael; Stroffolino, Anthony; Davis, Lauren; Merritt, Gabrielle; Piccoli, Matthew; Yim, Mark</i>
4	09:26-09:29	Humanoid Compliant Whole Arm Dexterous Manipulation: Control Design and Experiments <i>Wimboeck, Thomas; Florek - Jasinska, Monika; Ott, Christian</i>	Recursive Non-Uniform Coverage of Unknown Terrains for UAVs <i>Sadat, Abbas; Wawerla, Jens; Vaughan, Richard</i>	Approaches to Robotic Teleoperation in a Disaster Scenario: From Supervised Autonomy to Direct Control <i>Katyal, Kapil; Brown, Christopher; Hechtman, Steven A.; Para, Matthew; McGee, Timothy G.; Wolfe, Kevin; Murphy, Ryan Joseph; Kutzer, Michael Dennis Mays; Tunstel, Edward; Mcloughlin, Michael; Johannes, Matthew</i>
5	09:29-09:32	Analyzing Human Fingertip Usage in Dexterous Precision Manipulation: Implications for Robotic Fingertip Design <i>Bullock, Ian; Feix, Thomas; Dollar, Aaron</i>	Path Planning with Stability Uncertainty for Articulated Mobile Vehicles in Challenging Environments <i>Norouzi, Mohammad; Valls Miro, Jaime; Dissanayake, Gamini; Vidal-Calleja, Teresa A.</i>	Remote Vertical Exploration by Active Scope Camera into Collapsed Buildings <i>Junichi, Fukuda; Konyo, Masashi; Takeuchi, Eijiro; Tadokoro, Satoshi</i>
6	09:32-09:35	Adaptive Under-Actuated Anthropomorphic Hand: ISR-SoftHand <i>Tavakoli, Mahmoud; de Almeida, Anibal</i>	Closed-Loop Global Motion Planning for Reactive Execution of Learned Tasks <i>Bowen, Chris; Alterovitz, Ron</i>	Estimation of Ground Surface Radiation Sources from Dose Map Measured by Moving Dosimeter and 3D Map <i>Minamoto, Gaku; Takeuchi, Eijiro; Tadokoro, Satoshi</i>
7	09:35-09:38	Coordinated Motion Control of a Nonholonomic Mobile Manipulator for Accurate Motion Tracking <i>Jia, Yunyi; Xi, Ning; Cheng, Yu; Liang, Siyang</i>	An Empirical Study of Optimal Motion Planning <i>Luo, Jingru; Hauser, Kris</i>	Making a Robot Dance to Diverse Musical Genre in Noisy Environments <i>Oliveira, João Lobato; Nakamura, Keisuke; Langlois, Thibault; Gouyon, Fabien; Nakadai, Kazuhiro; Lim, Angelica; Reis, Luis Paulo; Okuno, Hiroshi G.</i>
8	09:38-09:41	Hierarchical Fingertip Space for Multi-Fingered Precision Grasping <i>Hang, Kaiyu; Stork, Johannes Andreas; Kragic, Danica</i>	The Lion and Man Game on Polyhedral Surfaces with Boundary <i>Noori, Narges; Isler, Volkan</i>	Improvement in Outdoor Sound Source Detection Using a Quadrotor-Embedded Microphone Array <i>Ohata, Takuma; Nakamura, Keisuke; Mizumoto, Takeshi; Tezuka, Taiki; Nakadai, Kazuhiro</i>
9	09:41-09:44	Modeling of Skid-Steer Mobile Manipulators Using Spatial Vector Algebra and Experimental Validation with a Compact Loader <i>Aguilera, Sergio; Torres-Torriti, Miguel; Auat Cheein, Fernando</i>	Motion Planning under Uncertainty for Medical Needle Steering Using Optimization in Belief Space <i>Sun, Wen; Alterovitz, Ron</i>	Visualization of auditory awareness based on sound source positions estimated by depth sensor and microphone array <i>Iyama, Takahiro; Sugiyama, Osamu; Otsuka, Takuma; Itoyama, Katsutoshi; Okuno, Hiroshi G.</i>
10	09:44-09:47	Physically-Consistent Sensor Fusion in Contact-Rich Behaviors <i>Lowrey, Kendall; Kolev, Svetoslav; Tassa, Yuval; Erez, Tom; Todorov, Emanuel</i>	A Sampling-Based Algorithm for Multi-Robot Visibility-Based Pursuit-Evasion <i>Stiffler, Nicholas; O'Kane, Jason</i>	Rapidly Learning Musical Beats in the Presence of Environmental and Robot Ego Noise <i>Grunberg, David; Kim, Youngmoo</i>
11	09:47-09:50	A Real-Time Distributed Architecture for Large-Scale Tactile Sensing <i>Baglini, Emanuele; Youssefi, Shahbaz; Mastrogiovanni, Fulvio; Cannata, Giorgio</i>	Online Learning of Task-Specific Dynamics for Periodic Tasks <i>Petric, Tadej; Gams, Andrej; Zlatjapa, Leon; Ude, Ales</i>	Audio Ray Tracing for Position Estimation of Entities in Blind Regions <i>Even, Jani; Morales Saiki, Luis Yoichi; Kallakuri, Nagasrikanth; Ishi, Carlos Toshinori; Hagita, Norihiro</i>

## Tuesday Session A, 09:00 - 10:20 (Continued)

		Grand Ballroom TuA1	State Ballroom TuA2	Red Lacquer Room TuA3
#	Time	Parallel Robotics	Localization and Mapping II	Field Robotics
12	09:50-09:53	A New Extension of Desired Compensation Adaptive Control and Its Real-Time Application to Redundantly Actuated PKMs <i>Bennehar, Moussab; Chemori, Ahmed; Pierrot, François</i>	Towards Consistent Reconstructions of Indoor Spaces Based on 6D RGB-D Odometry and KinectFusion <i>Dong, Haiwei; Figueroa, Nadia; El Saddik, Abdulmotaleb</i>	An Adaptive Basic I/O Gain Tuning Method Based on Leveling Control Input Histogram for Human-Machine Systems <i>Kamezaki, Mitsuhiro; Iwata, Hiroyasu; Sugano, Shigeki</i>
13	09:53-09:56	Structural Synthesis of Dexterous Hands <i>Ozgur, Erol; Gogu, Grigore; Mezouar, Youcef</i>	Biologically Inspired SLAM Using Wi-Fi <i>Berkvens, Rafael; Jacobson, Adam; Milford, Michael J; peremans, herbert; Weyn, Maarten</i>	Development and Field Test of Teleoperated Mobile Robots for Active Volcano Observation <i>Nagatani, Keiji; Akiyama, Ken; Yamauchi, Genki; Yoshida, Kazuya; Hada, Yasushi; Yuta, Shinichi; Izu, Tomoyuki; Randy, Mackay</i>
14	09:56-09:59	Study of Reconfigurable Suspended Cable-Driven Parallel Robots for Airplane Maintenance <i>NGUYEN, Dinh Quan; Gouttefarde, Marc</i>	Point Cloud Registration Using Congruent Pyramids <i>Krishnan, Aravindhan; Saripalli, Srikanth</i>	Intelligent Slip-Optimization Control with Traction-Energy Trade-Off for Wheeled Robots on Rough Terrain <i>Kim, Jayoung; Lee, Jihong</i>
15	09:59-10:02	Workspace Analysis of Two Similar 3-DOF Axis-Symmetric Parallel Manipulators <i>Marlow, Kristan; Isaksson, Mats; Abdi, Hamid; Nahavandi, Saeid</i>	On the Formulation, Performance and Design Choices of Cost-Curve Occupancy Grids for Stereo-Vision Based 3D Reconstruction <i>Brandao, Martim; Ferreira, Ricardo; Hashimoto, Kenji; Santos-Victor, José; Takanishi, Atsuo</i>	Novel Robot Mechanism Capable of 3D Differential Driving Inside Pipelines <i>Yang, Seung Ung; Kim, Ho Moon; Suh, Jung Seok; Choi, Yun Seok; Mun, Hyeong Min; Park, Chan Min; Moon, Hyungpil; Choi, Hyouk Ryeol</i>
16	10:02-10:05	Improvement of the Direct Kinematic Model of a Haptic Device for Medical Application in Real Time Using an Extra Sensor <i>saafi, Housseem; Iaribi, med amine; Zegloul, Said</i>	Handling Perceptual Clutter for Robot Vision with Partial Model-Based Interpretations <i>Tsai, Grace; Kuipers, Benjamin</i>	Autonomous Robotic System for Bridge Deck Data Collection and Analysis <i>La, Hung; Gucunski, Nenad; Kee, Seong-Hoon; Yi, Jingang; Senlet, Turgay; Nguyen, Luan</i>
17	10:05-10:08	Switching Strategy for Flexible Task Execution Using the Cooperative Dual Task-Space Framework <i>Figueroa, Luis Felipe da Cruz; Adorno, Bruno Vilhena; Ishihara, João Yoshiyuki; Borges, Geovany Araujo</i>	Modeling Motion Patterns of Dynamic Objects by IOHMM <i>Wang, Zhan; Ambrus, Rares; Jensfelt, Patric; Folkesson, John</i>	Road Surface Washing System for Decontaminating Radioactive Substances <i>Endo, Mitsuru; Endo, Mai; Kakizaki, Takao</i>
18	10:08-10:11	Vibration Control of 3P(S)4 Class Parallel Mechanisms for High Speed Applications Using Quantitative Feedback Design <i>Avci, Ebubekir; Kenmochi, Masanori; Kawanishi, Michihiro; Narikiyo, Tatsuo; Kawakami, Shinji; Saitoh, Yumi</i>	Fast Hybrid Relocation in Large Scale Metric-Topologic-Semantic Map <i>DROUILLY, Romain; Rives, Patrick; Morisset, Benoît</i>	A Framework for Predicting the Mission-Specific Performance of Autonomous Unmanned Systems <i>Durst, Phillip J; Gray, Wendell; Nikitenko, Agris; Caetano, Joao; King, Roger; Trentini, Michael</i>
19	10:11-10:14	Dimensional Synthesis of 4 DoFs (3T-1R) Actuatedly Redundant Parallel Manipulator Based on Dual Criteria: Dynamics and Precision <i>SHAYYA, Samah; Krut, Sebastien; Company, Olivier; Baradat, Cédric; Pierrot, François</i>	Stereo-Vision Based Obstacle Mapping for Indoor/Outdoor SLAM <i>Brand, Christoph; Schuster, Martin Johannes; Hirschmüller, Heiko; Suppa, Michael</i>	Experimental Analysis of Models for Trajectory Generation on Tracked Vehicles <i>Fink, Jonathan; Stump, Ethan</i>
20	10:14-10:17	Active Vibration Canceling of a Cable-Driven Parallel Robot Using Reaction Wheels <i>Weber, Xavier; Cuvillon, Loic; Gangloff, Jacques</i>	Meta-Rooms: Building and Maintaining Long Term Spatial Models in a Dynamic World <i>Ambrus, Rares; Bore, Nils; Folkesson, John; Jensfelt, Patric</i>	Sonar-Based Chain Following Using an Autonomous Underwater Vehicle <i>Hurtos, Natalia; Palomeras, Narcis; Carreras, Marc; Carrera, Arnau; Bechlioulis, Charalampos; Karras, George; Heshmati-alamdari, Shahab; Kyriakopoulos, Kostas</i>
21	10:17-10:20		Sponsor Talk: BRIN: Benchmark for Robotic Indoor Navigation <i>Parent, Gershon Microsoft Robotics</i>	Sponsor Talk: Vision-Based Navigation <i>Jones, Chris iRobot Corporation</i>

## Tuesday Session B, 10:50 - 12:10

		Grand Ballroom TuB1	State Ballroom TuB2	Red Lacquer Room TuB3
		Medical Robots and Systems I & Rehabilitation Robotics I	Human-Robot Interaction II & Robot Learning III	Marine Robotics & Space Robotics
	Chair	Papanikolopoulos, Nikos (University of Minnesota)	Zhang, Jianwei (University of Hamburg)	Leonard, John (MIT)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	10:50-11:10	Keynote: Medical Robotics - Melding Clinical Need with Engineering Research <i>Dupont, Pierre</i> Boston University	Keynote: Robots and Gaming - Therapy for Children with Disabilities <i>Howard, Ayanna</i> Georgia Tech	Keynote: Human-guided video data collection in marine environments <i>Dudek, Gregory</i> EPFL
		Medical Robots and Systems I	Human-Robot Interaction II	Marine Robotics
2	11:10-11:13	A Fast, Low-Cost, Computer Vision Approach for Tracking Surgical Tools <i>Dockter, Rodney; Sweet, Robert; Kowalewski, Timothy</i>	A Gesture Recognition System for Mobile Robots That Learns Online <i>Hamlet, Alan; Emami, Patrick</i>	Predicting the Speed of a Wave Glider Autonomous Surface Vehicle from Wave Model Data <i>Ngo, Phillip; Das, Jnaneshwar; Ogle, Jonathan; Thomas, Jesse; Anderson, Will; Smith, Ryan N.</i>
3	11:13-11:16	A Dynamically Consistent Hierarchical Control Architecture for Robotic-Assisted Tele-Echography <i>Santos, Luis; Cortesao, Rui</i>	Cartesian Impedance Control of Redundant Manipulators for Human-Robot Co-Manipulation <i>Ficuciello, Fanny; Romano, Amedeo; Villani, Luigi; Siciliano, Bruno</i>	3D Trajectory Synthesis and Control for a Legged Swimming Robot <i>Meger, David Paul; Shkurti, Florian; Cortés Poza, David; Giguere, Philippe; Dudek, Gregory</i>
4	11:16-11:19	Extended Kinematic Mapping of Tendon-Driven Continuum Robot for Neuroendoscopy <i>Kato, Takahisa; Okumura, Ichiro; Kose, Hidekazu; Takagi, Kiyoshi; Hata, Nobuhiko</i>	Estimation of Contact Forces Using a Virtual Force Sensor <i>Magrini, Emanuele; Flacco, Fabrizio; De Luca, Alessandro</i>	Control of a Compact, Tetherless ROV for In-Contact Inspection of Complex Underwater Structures <i>Bhattacharyya, Sampriti; Asada, Harry</i>
5	11:19-11:22	Dielectrophoresis-Based Automatic 3D Cell Manipulation and Patterning through a Micro-Electrode Integrated Multi-Layer Scaffold <i>Chu, Henry; Huan, Zhijie; Mills, James K.; Yang, Jie; Sun, Dong</i>	Multi-Muscle FES Control of the Human Arm for Interaction Tasks---Stabilizing with Muscle Co-contraction and Postural Adjustment: A Simulation Study <i>Liao, Yu-Wei; Scheerer, Eric; Perreault, Eric; Tresch, Matthew; Lynch, Kevin</i>	Three-Dimensional Reconstruction of Bridge Structures above the Waterline with an Unmanned Surface Vehicle <i>Han, Jungwook; Park, Jeonghong; Kim, JinWhan</i>
6	11:22-11:25	A Novel Redundant Motion Control Mechanism in Accordance with Medical Diagnostic and Therapeutic Task Functions for a NIUTS <i>Koizumi, Norihiro; Lee, Dongjun; Seo, Joonho; Tsukihara, Hiroyuki; Nomiya, Akira; Azuma, Takashi; Yoshinaka, Kiyoshi; Sugita, Naohiko; Homma, Yukio; Mitsuishi, Mamoru</i>	Pneumatic Tubular Body Fixture for Wearable Assistive Device - Analysis and Design of Active Cuff to Hold Upper Limb - <i>Hasegawa, Yasuhisa; Hasegawa, Takaaki; Eguchi, Kiyoshi</i>	I-AUV Docking and Intervention in a Subsea Panel <i>Palomeras, Narcis; Peñalver, Antonio; Massot-Campos, Miquel; Vallicrosa, Guillem; Negre Carrasco, Pep Lluís; Fernández, José Javier; Ridao, Pere; Sanz, Pedro J; Oliver, Gabriel A.; Palomer, Albert</i>
7	11:25-11:28	Simultaneously Powering and Controlling Many Actuators with a Clinical MRI Scanner <i>Becker, Aaron; Felfoul, Ouajdi; Dupont, Pierre</i>	Implementation and Experimental Validation of Dynamic Movement Primitives for Object Handover <i>Prada, Miguel; Remazeilles, Anthony; Koene, Ansgar Roald; Endo, Satoshi</i>	Active Range-Only Beacon Localization for AUV Homing <i>Vallicrosa, Guillem; Ridao, Pere; Ribas, David; Palomer, Albert</i>
8	11:28-11:31	Simultaneous Catheter and Environment Modeling for Trans-Catheter Aortic Valve Implantation <i>Shi, Chaoyang; Giannarou, Stamatia; Lee, Su-Lin; Yang, Guang-Zhong</i>	Support Vector Machine Classification of Muscle Cocontraction to Improve Physical Human-Robot Interaction <i>Moualeu, Antonio; Gallagher, William; Ueda, Jun</i>	Autonomous Vehicle Localization in a Vector Field: Underwater Vehicle Implementation <i>Song, Zhuoyuan; Mohseni, Kamran</i>
9	11:31-11:34	Structurally-Redesigned Concentric-Tube Manipulators with Improved Stability <i>Azimian, Hamidreza; Francis, Peter; Looi, Thomas; Drake, James</i>	Oscillation Reduction Scheme for Wearable Robots Employing Linear Actuators and Sensors <i>Park, Jong Hyeon; Choo, Junghoon; Jeong, Dong-Hyun; Jeong, Seungwoo; Chu, Gilwhoan</i>	Underway Path-Planning for an Unmanned Surface Vehicle Performing Cooperative Navigation for UUVs at Varying Depths <i>Hudson, Jonathan; Seto, Mae</i>
10	11:34-11:37	Online Identification of Abdominal Tissues in Vivo for Tissue-Aware and Injury-Avoiding Surgical Robots <i>Sie, Astrini; Winek, Michael; Kowalewski, Timothy</i>	Joint Configuration Strategy for Serial-Chain Safe Manipulators <i>HONG, SeongHun; Lee, Woosub; Cho, Changhyun; Kang, Sungchul; Lee, Hyeongcheol</i>	Experimental Validation of Robotic Manifold Tracking in Gyre-Like Flows <i>Michini, Matthew; Hsieh, M. Ani; Forgoston, Eric; Schwartz, Ira</i>
11	11:37-11:40	A Novel Micro Laser Ablation System Integrated with Image Sensor for Minimally Invasive Surgery <i>Su, Baiquan; Shi, Zhan; Liao, Hongen</i>	Single Muscle Site Seng Interface for Assistive Grasping <i>Weisz, Jonathan; Barszap, Alexander; Joshi, Sanjay; Allen, Peter</i>	Trajectory Planning with Adaptive Control Primitives for Autonomous Surface Vehicles Operating in Congested Civilian Traffic <i>Shah, Brual C.; Svec, Petr; Bertaska, Ivan R.; Klinger, Wilhelm; Sinisterra, Armando J.; Ellenrieder, Karl von; Dhanak, Manhar; Gupta, Satyandra K.</i>



## Tuesday Session B, 10:50 - 12:10 (Continued)

		Grand Ballroom TuB1	State Ballroom TuB2	Red Lacquer Room TuB3
#	Time	Rehabilitation Robotics I	Robot Learning III	Space Robotics
12	11:40-11:43	Preliminary Evaluation of a New Control Approach to Achieve Speed Adaptation in Robotic Transfemoral Prosthesis <i>Lenzi, Tommaso; Hargrove, Levi; Sensinger, Jonathon</i>	Using Haptics to Extract Object Shape from Rotational Manipulations <i>Strub, Claudius; Wörgötter, Florentin; Ritter, Helge Joachim; Sandamirskaya, Yulia</i>	Inchworm Style Gecko Adhesive Climbing Robot <i>kalouche, Simon; Wiltsie, Nicholas; Su, Hai-Jun; Parness, Aaron</i>
13	11:43-11:46	Development of an Elbow-Forearm Interlock Joint Mechanism Toward an Exoskeleton for Patients with Essential Tremor <i>Matsumoto, Yuya; Amemiya, Motoyuki; Kaneishi, Daisuke; Nakashima, Yasutaka; Seki, Masatoshi; Ando, Takeshi; Kobayashi, Yo; Iijima, Hiroshi; Nagaoka, Masanori; Fujie, Masakatsu G.</i>	Dynamic Attack Motion Prediction for Kendo Agent <i>Tanaka, Yasufumi; Kosuge, Kazuhiro</i>	Backup State Observer Based on Optic Flow Applied to Lunar Landing <i>Sabiron, Guillaume; Burlion, Laurent; Jonniaux, Grégory; Kervendal, Erwan; Bornschlegl, Eric; Raharijaona, Thibaut; Ruffier, Franck</i>
14	11:46-11:49	A Method for Predicting Personalized Pelvic Motion Based on Body Meta-Features for Gait Rehabilitation Robot <i>Shin, Sung Yul; Hong, Jisoo; Chun, Changmook; Kim, Seung-Jong; Kim, ChangHwan</i>	Integration of Various Concepts and Grounding of Word Meanings Using Multi-Layered Multimodal LDA for Sentence Generation <i>Attamimi, Muhammad; Fadlil, Muhammad; Abe, Kasumi; Nakamura, Tomoaki; Funakoshi, Kotaro; Nagai, Takayuki</i>	Experimental Evaluation of On-Board, Visual Mapping of an Object Spinning in Micro-Gravity Aboard the International Space Station <i>Twedde, Brent Edward; Setterfield, Timothy Philip; Saenz-Otero, Alvar; Miller, David W.; Leonard, John</i>
15	11:49-11:52	Towards Local Reflexive Control of a Powered Transfemoral Prosthesis for Robust Amputee Push and Trip Recovery <i>Thatte, Nitish; Geyer, Hartmut</i>	A Machine Learning Approach for Real-Time Reachability Analysis <i>Allen, Ross; Clark, Ashley; Starek, Joseph; Pavone, Marco</i>	Small Body Surface Mobility with a Limbed Robot <i>Helmick, Daniel; Douillard, Bertrand; Bajracharya, Max</i>
16	11:52-11:55	Analysis of Inertial Motion in Swing Phase of Human Gait and Its Application to Motion Generation Method of Transfemoral Prosthesis <i>Wada, Takahiro; Sano, Hiroshi; Sekimoto, Masahiro</i>	Transfer of Sparse Coding Representations and Object Classifiers across Heterogeneous Robots <i>Kira, Zsolt</i>	On Controller Parametric Sensitivity of Passive Object Handling in Space by Robotic Servicers <i>Rekleitis, Georgios; Papadopoulos, Evangelos</i>
17	11:55-11:58	Investigation of Contralateral Leg Response to Unilateral Stiffness Perturbations Using a Novel Device <i>Skidmore, Jeffrey; Barkan, Andrew; Artemiadis, Panagiotis</i>	A Perceptual Memory System for Grounding Semantic Representations in Intelligent Service Robots <i>Oliveira, Miguel; Lim, Gi Hyun; Seabra Lopes, Luis; Mohades Kasaei, Seyed Hamidreza; Tomé, Ana Maria; Chauhan, Aneesh</i>	Design of a Hopping Mechanism using Permanent Magnets for Small-scale Exploration Rovers <i>Kurusu, Masamitsu</i>
18	11:58-12:01	Mobile Robotic Gait Rehabilitation System CORBYS: Overview and First Results on Orthosis Actuation <i>Slavnic, Sinisa; Ristic-Durrant, Danijela; Tschakarow, Roko; Brendel, Thomas; Tüttemann, Markus; Leu, Adrian; Gräser, Axel</i>	Actor-Critic Design Using Echo State Networks in a Simulated Quadruped Robot <i>Schmidt, Nico M.; Baumgartner, Matthias; Pfeifer, Rolf</i>	Soft Landing of Capsule by Casting Manipulator System <i>Arisumi, Hitoshi; Otsuki, Masatsugu; Nishida, Shin-Ichiro</i>
19	12:01-12:04	Design and Control of an Exoskeleton System for Gait Rehabilitation Capable of Natural Pelvic Movement <i>Jung, Chan-Yul; Choi, Junho; Park, Shinsuk; Lee, Jong Min; Kim, ChangHwan; Kim, Seung-Jong</i>	Expensive Multiobjective Optimization for Robotics with Consideration of Heteroscedastic Noise <i>Ariizumi, Ryo; Tesch, Matthew; Choset, Howie; Matsuno, Fumitoshi</i>	Particle Filter Based 3D Position Tracking for Terrain Rovers Using Laser Point Clouds <i>Jayasekara, Peshala Gehan; Ishigami, Genya; Kubota, Takashi</i>
20	12:04-12:07	Integrated Control Method for Power-Assisted Rehabilitation: Ellipsoid Regression and Impedance Control <i>Lee, Jaemin; Kim, Minkyu; Oh, Sang-Rok; Kim, Keehoon</i>	Flop and Roll: Learning Robust Goal-Directed Locomotion for a Tensegrity Robot <i>Isken, Atil; Agogino, Adrian; SunSpiral, Vytautas; Tumer, Kagan</i>	A Real-Time Recognition Based Drilling Strategy for Lunar Exploration <i>Quan, Qiquan; Tang, Junyue</i>
21	12:07-12:10	reachMAN2: A Compact Rehabilitation Robot to Train Reaching and Manipulation <i>TONG, LIU ZHU; Klein, Julius; Anne Dual, Seraina; Teo, Chee Leong; burdet, etienne</i>	Efficient Bayesian Local Model Learning for Control <i>Meier, Franziska; Hennig, Philipp; Schaal, Stefan</i>	

## Tuesday Session C, 13:30 - 14:50

		Grand Ballroom TuC1	State Ballroom TuC2	Red Lacquer Room TuC3
		Dynamics and Control & Manipulation and Grasping IV	Humanoids and Biped II & Domestic and Interactive Robots	Localization and Mapping III & Visual Servoing and Tracking
	Chair	Buchli, Jonas (ETH Zurich)	Lee, C. S. George (Purdue University)	Neira, José (Universidad de Zaragoza)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	13:30-13:50	Keynote: Highly dynamic, energy-aware, biomimetic robots <i>Stramigioli, Stefano</i> University of Twente	Keynote: Human-Robot Interaction Socially Assistive Robotics <i>Scassellati, Brian</i> Yale University	Keynote: The SLAM Problem - A Fifteen Year Journey ..... <i>Dissanayake, Gamini</i> University of Technology, Sydney
		Dynamics and Control	Humanoids and Biped II	Localization and Mapping III
2	13:50-13:53	Robust Control of Flexible Joint Robots Based on Motor-Side Dynamics Reshaping Using Disturbance Observer (DOB) <i>Kim, Min Jun; Chung, Wan Kyun</i>	Perturbation Recovery of Biped Walking by Updating the Footstep <i>Fu, Chenglong</i>	Direction-Driven Navigation Using Cognitive Map for Mobile Robots <i>Shim, Vui Ann; Tian, Bo; Yuan, Miaolong; Tang, Huajin; Li, Haizhou</i>
3	13:53-13:56	A Novel RISE-Based Adaptive Feedforward Controller for Redundantly Actuated Parallel Manipulators <i>Bennehar, Moussab; Chemori, Ahmed; Pierrot, François</i>	Swing-Leg Retraction Efficiency in Bipedal Walking <i>Hasaneini, Seyed Javad; Macnab, Chris; Bertram, John; Leung, Henry</i>	ISPCG: Incremental Subgraph-Preconditioned Conjugate Gradient Method for Online SLAM with Many Loop-Closures <i>Jian, Yong-Dian; Dellaert, Frank</i>
4	13:56-13:59	Constrained Directions As a Path Planning Algorithm for Mobile Robots under Slip and Actuator Limitations <i>Soltani-Zarrin, Rana; Jayasuriya, Suhada</i>	Falling Prevention of Humanoid Robots by Switching Standing Balance and Hopping Motion Based on MOA Set <i>Yamamoto, Ko</i>	Real-Time RGB-D Registration and Mapping in Texture-Less Environments Using Ranked Order Statistics <i>Yousif, Khalid; Bab-hadiashar, Alireza; Hoseinnezhad, Reza</i>
5	13:59-14:02	Partially Analytical Extra-Insensitive Shaper for a Lightly Damped Flexible Arm <i>Kang, Chul-Goo; Ha, Manh-Tuan</i>	Preliminary Walking Experiments with Underactuated 3D Bipedal Robot MARLO <i>Buss, Brian G.; Ramezani, Alireza; Akbari Hamed, Kaveh; Griffin, Brent Austin; Galloway, Kevin; Grizzle, J.W</i>	Online Global Loop Closure Detection for Large-Scale Multi-Session Graph-Based SLAM <i>Labbé, Mathieu; Michaud, Francois</i>
6	14:02-14:05	Terminal Sliding-Mode Based Force Tracking Control of Piezoelectric Actuators for Variable Physical Damping System <i>Lee, Jinh; Jin, Maolin; Tsagarakis, Nikolaos; Caldwell, Darwin G.</i>	Running into a Trap: Numerical Design of Task-Optimal Preflex Behaviors for Delayed Disturbance Responses <i>Van Why, Johnathan; Hubicki, Christian; Jones, Mikhail; Daley, Monica; Hurst, Jonathan</i>	Selecting Good Measurements Via L1 Relaxation: A Convex Approach for Robust Estimation Over Graphs <i>Carlone, Luca; Censi, Andrea; Dellaert, Frank</i>
7	14:05-14:08	Development of a Single Controller for the Compensation of Several Types of Disturbances During Task Execution of a Wheeled Inverted Pendulum Assistant Robot <i>Canete, Luis; Takahashi, Takayuki</i>	SLIP with Swing Leg Augmentation As a Model for Running <i>Mohammadi Nejad Rashty, Aida; Ahmad Sharbafi, Maziar; Seyfarth, Andre</i>	Hybrid Inference Optimization for Robust Pose Graph Estimation <i>Segal, Aleksandr V.; Reid, Ian</i>
8	14:08-14:11	A Reverse Priority Approach to Multi-Task Control of Redundant Robots <i>Flacco, Fabrizio; De Luca, Alessandro</i>	Quantifying the Trade-Offs between Stability versus Energy Use for Underactuated Biped Walking <i>Saglam, Cenk Oguz; Byl, Katie</i>	Robust Graph SLAM Back-Ends: A Comparative Analysis <i>Latif, Yasir; Cadena Lerma, Cesar Dario; Neira, José</i>
9	14:11-14:14	Dynamic Modeling of Constant Curvature Continuum Robots Using the Euler-Lagrange Formalism <i>Falkenhahn, Valentin; Mahl, Tobias; Hildebrandt, Alexander; Neumann, Ruediger; Sawodny, Oliver</i>	Highly Robust Running of Articulated Biped in Unobserved Terrain <i>Wu, Albert; Geyer, Hartmut</i>	Graph SLAM with Signed Distance Function Maps on a Humanoid Robot <i>Wagner, René; Frese, Udo; Bäuml, Berthold</i>
10	14:14-14:17	Fast and Reasonable Contact Force Computation in Forward Dynamics Based on Momentum-Level Penetration Compensation <i>Wakisaka, Naoki; Sugihara, Tomomichi</i>	From Template to Anchor: A Novel Control Strategy for Spring-Mass Running of Bipedal Robots <i>Dadashzadeh, Behnam; Vejdani, Hamid Reza; Hurst, Jonathan</i>	Credibilist Simultaneous Localization and Mapping with a LIDAR <i>Trehard, Guillaume; Alsayed, Zayed; Pollard, Evangeline; BRADAI, Benazouz; Nashashibi, Fawzi</i>
11	14:17-14:20	Recursive Dynamics and Feedback Linearizing Control of Serial-Chain Manipulators <i>Travers, Matthew; Choset, Howie</i>	An Estimation Model for Footstep Modifications of Biped Robots <i>Wittmann, Robert; Hildebrandt, Arne-Christoph; Ewald, Alexander; Buschmann, Thomas</i>	Novel Insights into the Impact of Graph Structure on SLAM <i>Khosoussi, Kasra; Huang, Shoudong; Dissanayake, Gamini</i>

## Tuesday Session C, 13:30 - 14:50 (Continued)

		Grand Ballroom TuC1	State Ballroom TuC2	Red Lacquer Room TuC3
#	Time	Manipulation and Grasping IV	Domestic and Interactive Robots	Visual Servoing and Tracking
12	14:20-14:23	Grasp Planning for Constricted Parts of Objects Approximated with Quadric Surfaces <i>Tsuji, Tokuo; Uto, Soichiro; Harada, Kensuke; Kurazume, Ryo; Hasegawa, Tsutomu; Morooka, Ken'ichi</i>	Finding and Navigating to Household Objects with UHF RFID Tags by Optimizing RF Signal Strength <i>Deyle, Travis; Reynolds, Matthew; Kemp, Charlie</i>	Robust Model Predictive Control for Visual Servoing <i>Assa, Akbar; Janabi-Sharifi, Farrokh</i>
13	14:23-14:26	Fast Grasping of Unknown Objects Using Force Balance Optimization <i>LEI, QUJIANG; Wisse, Martijn</i>	RGB-D Sensor Setup for Multiple Tasks of Home Robots and Experimental Results <i>de la Puente, Paloma; Bajones, Markus; Einramhof, Peter; Wolf, Daniel; Fischinger, David; Vincze, Markus</i>	Prescribed Performance Image Based Visual Servoing under Field of View Constraints <i>Heshmati-alamdari, Shahab; Bechloulis, Charalampos; Liarakapis, Minas; Kyriakopoulos, Kostas</i>
14	14:26-14:29	Robotic Nonprehensile Catching: Initial Experiments <i>Yashima, Masahito; Yamawaki, Tasuku</i>	Enhanced Robotic Cleaning with a Low-Cost Tool Attachment <i>Xu, Zhe; Cakmak, Maya</i>	Monocular Template-Based Vehicle Tracking for Autonomous Convoy Driving <i>Fries, Carsten; Wuensche, Hans J</i>
15	14:29-14:32	Changing Pre-Grasp Strategies with Increasing Object Location Uncertainty <i>Illing, Boris; Asfour, Tamim; Pollard, Nancy S</i>	CHARM: A Platform for Algorithmic Robotics Education & Research <i>Singh, Surya; Kurniawati, Hanna; Soltani Naveh, Kianoosh; Song, Joshua; Zastrow, Tyson</i>	Real-Time Object Pose Recognition and Tracking with an Imprecisely Calibrated Moving RGB-D Camera <i>Pauwels, Karl; Ivan, Vladimir; Ros, Eduardo; Vijayakumar, Sethu</i>
16	14:32-14:35	Shrinkable, Stiffness-Controllable Soft Manipulator Based on a Bio-Inspired Antagonistic Actuation Principle <i>Stilli, Agostino; Wurdemann, Helge Arne; Althoefer, Kaspar</i>	Development of a Comic Mark Based Expressive Robotic Head Adapted to Japanese Cultural Background <i>KISHI, Tatsuhiro; Futaki, Hajime; Trovato, Gabriele; Endo, Nobutsuna; Destephe, Matthieu; Cosentino, Sarah; Hashimoto, Kenji; Takanishi, Atsuo</i>	Robust Ground Surface Map Generation Using Vehicle-Mounted Stereo Camera <i>Motooka, Kouma; Sugimoto, Shigeki; Okutomi, Masatoshi; Shima, Takeshi</i>
17	14:35-14:38	Guided Locomotion in 3D for Snake Robots Based on Contact Force Optimization <i>Ponte, Hugo; Travers, Matthew; Choset, Howie</i>	Effects of Bodily Mood Expression of a Robotic Teacher on Students <i>Xu, Junchao; broekens, joost; Hindriks, Koen; Neerincx, Mark</i>	RGB-D Fusion: Real-Time Robust Tracking and Dense Mapping with RGB-D Data Fusion <i>Lee, Seong-Oh; Lim, Hwasup; Kim, Hyoung-Gon; Ahn, Sang Chul</i>
18	14:38-14:41	Push Resistance in In-Hand Manipulation <i>He, Junhu; Zhang, Jianwei</i>	Real-Time Recognition of Pointing Gestures for Robot to Robot Interaction <i>Kondaxakis, Polychronis; Pajarinen, Joni; Kyrki, Ville</i>	Bearings-Only Path Following with a Vision-Based Potential Field <i>Sabatta, Deon; Siegart, Roland</i>
19	14:41-14:44	Online Interactive Perception of Articulated Objects with Multi-Level Recursive Estimation Based on Task-Specific Priors <i>Martin Martin, Roberto; Brock, Oliver</i>	Adaptive Spacing in Human-Robot Interactions <i>Papadakis, Panagiotis; Rives, Patrick; Spalanzani, Anne</i>	Event-Based, 6-DOF Pose Tracking for High-Speed Maneuvers <i>Mueggler, Elias; Huber, Basil; Scaramuzza, Davide</i>
20	14:44-14:47	Using Environment Objects As Tools: Unconventional Door Opening <i>Levihn, Martin; Stilman, Mike</i>	Determining the Affective Body Language of Older Adults during Socially Assistive HRI <i>McCull, Derek; Nejat, Goldie</i>	Learning Visual Feature Descriptors for Dynamic Lighting Conditions <i>Carlevaris-Bianco, Nicholas; Eustice, Ryan</i>
21	14:47-14:50	Sponsor Talk: Components for Mobile Manipulation: Light-Weight Arms and Robotic Hands <i>Parlitz, Christopher SCHUNK</i>	Sponsor Talk: The Eyes: A History of Baxter's Personification <i>Maroney, Kyle Rethink Robotics</i>	Detection of Small Moving Objects Using a Moving Camera <i>Shakeri, Moein; Zhang, Hong</i>

## Tuesday Session D, 15:00 - 16:20

		Grand Ballroom TuD1 Actuators & Kinematics and Mechanism Design II	State Ballroom TuD2 Reasoning and AI Planning & Path and Task Planning	Red Lacquer Room TuD3 Sensing I & Sensing for Human Environments
Chair		Krovi, Venkat (University at Buffalo (SUNY Buffalo))	Jacobs, Sam Ade (ABB Inc)	Song, Dezhen (Texas A&M University)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	15:00-15:20	Keynote: Robots for Interaction with Humans and Unknown Environments <i>Albu-Schäffer, Alin</i> DLR	Keynote: Symbiotic Mobile Robot Autonomy in Human Environments <i>Veloso, Manuela</i> Carnegie Mellon University	Keynote: Life In a World of Ubiquitous Sensing <i>Hager, Gregory</i> Johns Hopkins University
		Actuators	Reasoning and AI Planning	Sensing I
2	15:20-15:23	Soft Pneumatic Actuator Skin with Embedded Sensors <i>Suh, Chansu; Condal Margarit, Jordi; Song, Yun</i> <i>Seong; Paik, Jamie</i>	Prior-Assisted Propagation of Spatial Information for Object Search <i>Lorbach, Malte; Höfer, Sebastian; Brock, Oliver</i>	Augmenting Bayes Filters with the Relevance Vector Machine for Time-Varying Context-Dependent Observation Distribution <i>Ravet, Alexandre; Lacroix, Simon; Hattenberger, Gautier</i>
3	15:23-15:26	Towards Variable Stiffness Control of Antagonistic Twisted String Actuators <i>Popov, Dmitry; Gaponov, Igor; Ryu, Jee-Hwan</i>	Combining Top-Down Spatial Reasoning and Bottom-Up Object Class Recognition for Scene Understanding <i>Kunze, Lars; Burbridge, Christopher; Alberti, Marina; Thippur, Akshaya; Folkesson, John; Jensfelt, Patric; Hawes, Nick</i>	Audio-Visual Classification and Detection of Human Manipulation Actions <i>Pieropan, Alessandro; Salvi, Giampiero; Pauwels, Karl; Kjellstrom, Hedvig</i>
4	15:26-15:29	A Multiplex Pneumatic Actuator Drive Method Based on Acoustic Communication in Air Supply Line <i>Suzumori, Koichi; Osaki, Naoto; Misumi, Jumpei; Yamamoto, Akina; Kanda, Takefumi</i>	Learning Relational Affordance Models for Two-Arm Robots <i>Moldovan, Bogdan; De Raedt, Luc</i>	Object Shape Categorization in RGBD Images using Hierarchical Graph Constellation Models based on Unsupervisedly Learned Shape Parts described by a Set of Shape Specificity Levels <i>Mueller, Christian Atanas; Pathak, Kaustubh; Birk, Andreas</i>
5	15:29-15:32	A Low-Friction Passive Fluid Transmission and Fluid-Tendon Soft Actuator <i>Whitney, John; Glisson, Matthew; Brockmeyer, Eric; Hodgins, Jessica</i>	Cognitive Factories with Multiple Teams of Heterogeneous Robots: Hybrid Reasoning for Optimal Feasible Global Plans <i>Saribatur, Zeynep G.; Erdem, Esra; Patoglu, Volkan</i>	sEMG-Based Decoding of Human Intentions Robust to the Changes of Electrode Positions <i>Park, Myoung Soo</i>
6	15:32-15:35	Design of a Novel Intermittent Self-Closing Mechanism for a MACCEPA-Based Series-Parallel Elastic Actuator (SPEA) <i>Mathijssen, Glenn; Furnémont, Raphaël; Brackx, Branko; Van Ham, Ronald; Lefeber, Dirk; Vanderborght, Bram</i>	Incorporating Kinodynamic Constraints in Automated Design of Simple Machines <i>Erdogan, Can; Stilman, Mike</i>	Multi-Target Visual Tracking with Aerial Robots <i>Tokekar, Pratap; Isler, Volkan; Franchi, Antonio</i>
7	15:35-15:38	A Resonant Parallel Elastic Actuator for Biorobotic Applications <i>Sudano, Angelo; Tagliamonte, Nevio Luigi; Accoto, Dino; Guglielmelli, Eugenio</i>	Unifying Multi-Goal Path Planning for Autonomous Data Collection <i>Faigl, Jan; Hollinger, Geoffrey</i>	Opportunistic Sampling-Based Planning for Active Visual SLAM <i>Chaves, Stephen; Kim, Ayoung; Eustice, Ryan</i>
8	15:38-15:41	Smart Braid: Air Muscles That Measure Force and Displacement <i>Felt, Wyatt; Remy, C. David</i>	Stochastic Collection and Replenishment (SCAR) Optimisation for Persistent Autonomy <i>Palmer, Andrew William; Hill, Andrew John; Scheduling, Steven</i>	Ear-Based Exploration on Hybrid Metric/Topological Maps <i>Zhang, Qiwen; Whitney, David; Shkurti, Florian; Rekleitis, Ioannis</i>
9	15:41-15:44	Variable Stiffness Fabrics with Embedded Shape Memory Materials for Wearable Applications <i>Chenal, Thomas; Case, Jennifer; Paik, Jamie; Kramer, Rebecca</i>	Coverage Planning with Finite Resources <i>Strimel, Grant; Veloso, Manuela</i>	Fast and Effective Visual Place Recognition using Binary Codes and Disparity Information <i>Arroyo, Roberto; Fernández Alcantarilla, Pablo; Bergasa, Luis Miguel; Yeles, José Javier; Bronte, Sebastian</i>
10	15:44-15:47	A Flexible Passive Joint for Robotic Fish Pectoral Fins: Design, Dynamic Modeling, and Experimental Results <i>Bazaz Behbahani, Sanaz; Tan, Xiaobo</i>	Coordination in Human-Robot Teams Using Mental Modeling and Plan Recognition <i>Talamadupula, Kartik; Briggs, Gordon; Chakraborti, Tathagata; Scheutz, Matthias; Kambhampati, Subbarao</i>	A Linear Approach to Visuo-Inertial Fusion for Homography-Based Filtering and Estimation <i>Eudes, Alexandre; Morin, Pascal</i>
11	15:47-15:50	Formulation and Optimization of Pulley-Gear-Type SMA Heat Engine Toward Microfluidic MEMS Motor <i>Aono, Hiroyuki; Imamura, Ryota; Fuchiwaki, Ohmi; Yamanashi, Yuki; Böhringer, Karl F.</i>	A Framework for Formal Specification of Robotic Constraint-Based Tasks and their Concurrent Execution with Online QoS Monitoring <i>Scioni, Enea; Borghesan, Gianni; Bruyninckx, Herman; Bonfe, Marcello</i>	Fusion of Optical Flow and Inertial Measurements for Robust Egomotion Estimation <i>Bloesch, Michael; Omari, Sammy; Fankhauser, Péter; Sommer, Hannes; Gehring, Christian; Hwangbo, Jemin; Hoepflinger, Mark; Hutter, Marco; Siegwart, Roland</i>

## Tuesday Session D, 15:00 - 16:20 (Continued)

		Grand Ballroom TuD1	State Ballroom TuD2	Red Lacquer Room TuD3
#	Time	Kinematics and Mechanism Design II	Path and Task Planning	Sensing for Human Environments
12	15:50-15:53	Design, Principles, and Testing of a Latching Modular Robot Connector <i>Eckenstein, Nick; Yim, Mark</i>	Synthesizing Manipulation Sequences for Under-Specified Tasks Using Unrolled Markov Random Fields <i>Sung, Jaeyong; Selman, Bart; Saxena, Ashutosh</i>	Cameraman Robot: Dynamic Trajectory Tracking with Final Time Constraint Using State-Time Space Stochastic Approach <i>Ardiyanto, Igi; Miura, Jun</i>
13	15:53-15:56	Design, Modeling and Performance Evaluation of a Long and Slim Continuum Robotic Cable <i>Tonapi, Manas; Godage, Isuru S.; Walker, Ian</i>	A Probability-Based Path Planning Method Using Fuzzy Logic <i>Lee, Jaeyeon; Park, Wooram</i>	Automatic Detection and Verification of Pipeline Construction Features with Multi-Modal Data <i>Vidal-Calleja, Teresa A.; Valls Miro, Jaime; Martin, Fernando; Lingnau, Daniel C.; Russell, David E.</i>
14	15:56-15:59	Kinetostatic Optimization for an Adjustable Four-Bar Based Articulated Leg-Wheel Subsystem <i>Alamdari, Aliakbar; Sovizi, Javad; Jun, Seung-kook; Krovi, Venkat</i>	Multi-Goal Path Planning Based on the Generalized Traveling Salesman Problem with Neighborhoods <i>Vicencio, Kevin; Davis, Brian; Gentilini, Iacopo</i>	Grasping Point Selection on an Item of Crumpled Clothing Based on Relational Shape Description <i>Yamazaki, Kimitoshi</i>
15	15:59-16:02	A Single DOF Arm for Transition of Climbing Robots between Perpendicular Planes <i>Viegas, Carlos; Tavakoli, Mahmoud</i>	A Multi-Tree Extension of the Transition-Based RRT: Application to Ordering-And-Pathfinding Problems in Continuous Cost Spaces <i>Devaurs, Didier; Simeon, Thierry; Cortes, Juan</i>	A Solution to Pose Ambiguity of Visual Markers Using Moire Patterns <i>Tanaka, Hideyuki; Sumi, Yasushi; Matsumoto, Yoshio</i>
16	16:02-16:05	Design of Variable Release Torque-Based Compliant Spring-Clutch and Torque Estimation <i>Seok, Jushin; Kang, Sungchul; Lee, Woosub</i>	Informed RRT*: Optimal Sampling-based Path Planning Focused via Direct Sampling of an Admissible Ellipsoidal Heuristic <i>Gammell, Jonathan David; Srinivasa, Siddhartha; Barfoot, Timothy</i>	On Leader Following and Classification <i>Stein, Procópio; Spalanzani, Anne; Santos, Vitor; Laugier, Christian</i>
17	16:05-16:08	Principles of Microscale Flexure Hinge Design for Enhanced Endurance <i>Malka, Ronit; Lussier Desbiens, Alexis; Chen, YuFeng; Wood, Robert</i>	Integrating Multiple Soft Constraints for Planning Practical Paths <i>Yang, Jing; dymond, patrick; Jenkin, Michael</i>	Complexity-Based Motion Features and Their Applications to Action Recognition by Hierarchical Spatio-Temporal Naive Bayes Classifier <i>Kwon, Woo Young; Suh, Il Hong</i>
18	16:08-16:11	Strengthening of 3D Printed Robotic Parts Via Fill Compositing <i>Belter, Joseph; Dollar, Aaron</i>	Sampling-Based Trajectory Imitation in Constrained Environments Using Laplacian-RRT* <i>Nierhoff, Thomas; Hirche, Sandra; Nakamura, Yoshihiko</i>	Enhancement of Layered Hidden Markov Model by Brain-Inspired Feedback Mechanism <i>Lee, Sang Hyoung; Kim, Min Gu; Suh, Il Hong</i>
19	16:11-16:14	Cogeneration of Mechanical, Electrical, and Software Designs for Printable Robots from Structural Specifications <i>Mehta, Ankur; DelPreto, Joseph; Shaya, Benjamin; Rus, Daniela</i>	The Anatomy of a Distributed Motion Planning Roadmap <i>Jacobs, Sam Ade; Amato, Nancy</i>	Guiding Computational Perception through a Shared Auditory Space <i>Martinson, Eric; Yalla, Ganesh</i>
20	16:14-16:17	Design of a Robotic Finger Using Series Gear Chain Mechanisms <i>Mishima, Yuuki; Ozawa, Ryuta</i>	Safest Path Adversarial Coverage <i>Yehoshua, Roi; Agmon, Noa; Kaminka, Gal A</i>	Classification and Identification of Robot Sensing Data Based on Nested Infinite GMM <i>Sasaki, Yoko; Hatao, Naotaka; Kagami, Satoshi</i>
21	16:17-16:20	Sponsor Talk: The Next Research Revolution with KUKA's Robotic Reference Platforms <i>Ryan, Corey</i> KUKA Robotics Corp	Planning with the STAR(s) <i>Karydis, Konstantinos; Zarrouk, David; Poulakakis, Ioannis; Fearing, Ronald; Tanner, Herbert G.</i>	Localization of Multiple Sources from a Binaural Head in a Known Noisy Environment <i>Portello, Alban; Bustamante, Gabriel; Danès, Patrick; Mifsud, Alexis</i>

## Tuesday Session E, 16:50 - 17:55

		Grand Ballroom TuE1	State Ballroom TuE2	Red Lacquer Room TuE3
		Constrained and Underactuated Robots & Legged Robots I	Human-Robot Interaction III & Grasp Learning	Unmanned Aerial Systems I & Localization and Pose Estimation
Chair		Buehler, Martin (Vecna Technologies)	Wettels, Nicholas (NASA-JPL)	Clark, Christopher M. (Harvey Mudd College)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	16:50-17:10	Keynote: Robot Motion Optimization <i>Park, Frank</i> Seoul National University	Keynote: Perception-Action-Learning and Associative Skill Memories <i>Schaal, Stefan</i> University of Southern California	Keynote: Aerial Robot Swarms <i>Kumar, Vijay</i> University of Pennsylvania
		Constrained and Underactuated Robots	Human-Robot Interaction III	Unmanned Aerial Systems I
2	17:10-17:13	A Novel Continuum-Style Robot with Multilayer Compliant Modules <i>Qi, Peng; Qiu, Chen; Liu, Hongbin; Dai, Jian; Seneviratne, Iakmal; Althoefer, Kaspar</i>	Remote Control System for Multiple Mobile Robots Using Touch Panel Interface and Autonomous Mobility <i>Ochiai, Yuya; Takemura, Kentaro; Ikeda, Atsutoshi; Takamatsu, Jun; Ogasawara, Tsukasa</i>	Frequency-Domain Flight Dynamics Model Identification of MAVs - Miniature Quad-Rotor Aerial Vehicles <i>Guowei, Cai; Al Mehairi, Hind; Al-Hosani, Hanan; Dias, Jorge; Seneviratne, Iakmal</i>
3	17:13-17:16	A Fish-Like Locomotion Model in an Ideal Fluid with Lateral-Line-Inspired Background Flow Estimation <i>Xu, Yiming; Mohseni, Kamran</i>	Ridesharing with Passenger Transfers <i>Coltin, Brian; Veloso, Manuela</i>	Simulating Quadrotor UAVs in Outdoor Scenarios <i>Symington, Andrew Colquhoun; De Nardi, Renzo; Julier, Simon Justin; Hailes, Stephen</i>
4	17:16-17:19	MR Compatible Continuum Robot Based on Closed Elastica with Bending and Twisting <i>Yamada, Atsushi; Naka, Shigeyuki; Morikawa, Shigehiro; Tani, Tohru</i>	Modeling of Human Velocity Habituation for a Robotic Wheelchair <i>Morales Saiki, Luis Yoichi; Abdur-Rahim, Jamilah; Even, Jani; Kondo, Tadahisa; Hagita, Norihiro; Ogawa, Takeshi; Ishii, Shin; Watanabe, Atsushi</i>	Health Aware Stochastic Planning for Persistent Package Delivery Missions Using Quadrotors <i>Agha-mohammadi, Ali-akbar; Ure, Nazim Kemal; How, Jonathan; Vian, John</i>
5	17:19-17:22	Trajectory Optimization of Flapping Wings Modeled as a Three Degree-Of-Freedoms Oscillation System <i>Qin, Yi; Cheng, Bo; Deng, Xinyan</i>	Physical Embodied Communication between Robots and Children: An Approach for Relationship Building by Holding Hands <i>Hieida, Chie; Abe, Kasumi; Attamimi, Muhammad; Shimotomai, Takayuki; Nagai, Takayuki; Omori, Takashi</i>	High-Throughput Study of Flapping Wing Aerodynamics for Biological and Robotic Applications <i>Gravish, Nicholas; Chen, YuFeng; Combes, Stacey; Wood, Robert</i>
6	17:22-17:25	The Use of Unicycle Robot Control Strategies for Skid-Steer Robots through the ICR Kinematic Mapping <i>Pentzer, Jesse; Brennan, Sean; Reichard, Karl</i>	Using Social Cues to Estimate Possible Destinations When Driving a Robotic Wheelchair <i>ESCOBEDO-CABELLO, Jesus-Arturo; Spalanzani, Anne; Laugier, Christian</i>	Computational Morphology for a Soft Micro Air Vehicle in Hovering Flight <i>Chevallereau, Christine; Porez, Mathieu; Boyer, Frédéric</i>
7	17:25-17:28	Open-Source, Affordable, Modular, Light-Weight, Underactuated Robot Hands <i>Zisimatos, Agisilaos; Liarokapis, Minas; Mavrogiannis, Christoforos; Kyriakopoulos, Kostas</i>	A Novel User-Guided Interface for Robot Search <i>Kosti, Shahar; Sarne, David; Kaminka, Gal A</i>	Towards Valve Turning Using a Dual-Arm Aerial Manipulator <i>Korpela, Christopher M.; Orsag, Matko; Oh, Paul Y.</i>
8	17:28-17:31	Modeling of Wheeled Mobile Robots As Differential-Algebraic Systems <i>Kelly, Alonzo; Seegmiller, Neal Andrew</i>	Contextual Task-Aware Shared Autonomy for Assistive Mobile Robot Teleoperation <i>Gao, Ming; Oberländer, Jan; Schamm, Thomas; Zöllner, Johann Marius</i>	Control of a Multirotor Outdoor Aerial Manipulator <i>Heredia, Guillermo; Jimenez-Cano, Antonio; Sanchez, M. Ivan; Llorente, Domingo; Vega, Victor; Braga, Juan; Acosta, Jose Angel; Ollero, Anibal</i>
9	17:31-17:34	Practical Identification and Flatness Based Control of a Terrestrial Quadrotor <i>thorel, sylvain; d'Andréa-Novel, Brigitte</i>	Personalizing Vision-Based Gestural Interfaces for HRI with UAVs: A Transfer Learning Approach <i>Costante, Gabriele; Belloccchio, Enrico; Valigi, Paolo; Ricci, Elisa</i>	Reinforcement Learning for Autonomous Dynamic Soaring in Shear Winds <i>Montella, Corey; Spletzer, John</i>
10	17:34-17:37	Partial Force Control of Constrained Floating-Base Robots <i>Del Prete, Andrea; Mansard, Nicolas; Nori, Francesco; Metta, Giorgio; Natale, Lorenzo</i>	Multimodal Real-Time Contingency Detection for HRI <i>Chu, Vivian; Bullard, Kalesha; Thomaz, Andrea Lockerd</i>	Vision-Based Absolute Localization for Unmanned Aerial Vehicles <i>YOL, Aurélien; Delabarre, Bertrand; Dame, Amaury; DARTOIS, Jean-Emile; Marchand, Eric</i>
11	17:37-17:40	Balancing Control Algorithm for a 3D Under-Actuated Robot <i>Azad, Morteza; Featherstone, Roy</i>	Pose Estimation in Physical Human-Machine Interactions with Application to Bicycle Riding <i>Zhang, Yizhai; Chen, Kuo; Yi, Jingang; Liu, Liu</i>	Variable Impedance Control for Aerial Interaction <i>Mersha, Abeje Y.; Stramigioli, Stefano; Carloni, Raffaella</i>

## Tuesday Session E, 16:50 - 17:55 (Continued)

		Grand Ballroom TuE1	State Ballroom TuE2	Red Lacquer Room TuE3
#	Time	Legged Robots I	Grasp Learning	Localization and Pose Estimation
12	17:40-17:43	On the Convergence of Fixed-point Iteration in Solving Complementarity Problems Arising in Robot Locomotion and Manipulation <i>Lu, Ying; Trinkle, Jeff</i>	Learning of Grasp Adaptation through Experience and Tactile Sensing <i>Li, Miao; Bekiroglu, Yasemin; Kragic, Danica; Billard, Aude</i>	Improving Object Tracking through Distributed Exploration of an Information Map <i>Neveln, Izaak; Miller, Lauren; MacIver, Malcolm A.; Murphey, Todd</i>
13	17:43-17:46	Quadruped Bounding Control with Variable Duty Cycle Via Vertical Impulse Scaling <i>Park, Hae-Won; Chuah, Meng Yee (Michael); Kim, Sangbae</i>	Construction of an Object Manipulation Database from Grasp Demonstrations <i>Kent, David; Chernova, Sonia</i>	Topometric Localization on a Road Network <i>Xu, Danfei; Badino, Hernan; Huber, Daniel</i>
14	17:46-17:49	Posture and Balance Control for Humanoid Robots in Multi-Contact Scenarios Based on Model Predictive Control <i>Henze, Bernd; Ott, Christian; Roa, Maximo A.</i>	Evaluating the Efficacy of Grasp Metrics for Utilization in a Gaussian Process-Based Grasp Predictor <i>Goins, Alex; Carpenter, Ryan; Wong, Weng-Keen; Balasubramanian, Ravi</i>	Pose Estimation of Servo-Brake-Controlled Caster Units Arbitrarily Located on a Mobile Base <i>Saida, Masao; Hirata, Yasuhisa; Kosuge, Kazuhiro</i>
15	17:49-17:52	Optimal Gaits and Motions for Legged Robots <i>Xi, Weitao; Remy, C. David</i>	Predicting Object Interactions from Contact Distributions <i>Kroemer, Oliver; Peters, Jan</i>	Rail-Guided Robotic End-Effector Position Error Due to Rail Compliance and Ship Motion <i>Borgerink, Dian J.; Stegenga, Jan; Brouwer, Dannis M.; Wörtche, Heinrich; Stramigioli, Stefano</i>
16	17:52-17:55	Quadratic Programming-Based Inverse Dynamics Control for Legged Robots with Sticking and Slipping Frictional Contacts <i>Zapolsky, Samuel; Drumwright, Evan</i>	Learning Robot Tactile Sensing for Object Manipulation <i>Chebatar, Yevgen; Kroemer, Oliver; Peters, Jan</i>	A Multi-AUV State Estimator for Determining the 3D Position of Tagged Fish <i>Lin, Yukun; Kastein, Hannah; Peterson, Taylor; White, Connor; Lowe, Christopher G.; Clark, Christopher M.</i>

## Wednesday Session A, 09:00 - 10:20

		Grand Ballroom WeA1 Medical Robots and Systems II & Rehabilitation Robotics II	State Ballroom WeA2 Motion and Path Planning III & Planning, Failure Detection and Recovery	Red Lacquer Room WeA3 Networked Robots & Swarm Robotics
	Chair	Taylor, Russell H. (Johns Hopkins University)	Kroeger, Torsten (Google, Inc.)	Vaughan, Richard (Simon Fraser University)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	09:00-09:20	Keynote: Towards Intelligent Robotic Surgical Assistants <i>Cavusoglu, M. Cenk</i> Case Western Reserve University	Keynote: Planning for Complex High-Level Missions <i>Kavraki, Lydia</i> Rice University	Keynote: Networked Robots <i>Rus, Daniela</i> MIT
		Medical Robots and Systems II	Motion and Path Planning III	Networked Robots
2	09:20-09:23	Task-Space Motion Planning of MRI-Actuated Catheters for Catheter Ablation of Atrial Fibrillation <i>Greigarn, Tipakorn; Cavusoglu, M. Cenk</i>	Nonlinear Dimensionality Reduction for Kinematic Cartography with an Application Toward Robotic Locomotion <i>Dear, Tony; Hatton, Ross; Choset, Howie</i>	Autonomous Wireless Backbone Deployment with Bounded Number of Networked Robots <i>Santos, Elerson Rubens da Silva; Vieira, Marcos</i>
3	09:23-09:26	Using Lie Algebra for Shape Estimation of Medical Snake Robots <i>Rangaprasad, Arun Srivatsan; Travers, Matthew; Choset, Howie</i>	Orienting in Mid-Air through Configuration Changes to Achieve a Rolling Landing for Reducing Impact after a Fall <i>Bingham, Jeffrey; Lee, Jeongseok; Haksar, Ravi; Ueda, Jun; Liu, Karen</i>	Point Cloud Culling for Robot Vision Tasks under Communication Constraints <i>Beksi, William; Papanikolopoulos, Nikos</i>
4	09:26-09:29	Modeling and Control of Robotic Surgical Platform for Single-Port Access Surgery <i>Lee, Jusuk; Kim, Jiyoung; Lee, Kwang-Kyu; Hyung, SeungYong; Kim, Yong-Jae; Kwon, Woong; Roh, Kyungshik; Choi, Jung-Yun</i>	Motion Planning for Non-Holonomic Mobile Robots Using the I-PID Controller and Potential Field <i>Ma, Yingchong; Zheng, Gang; perruquetti, Wilfrid; QIU, Zhaopeng</i>	Robust Routing and Multi-Confirmation Transmission Protocol for Connectivity Management of Mobile Robotic Teams <i>Stephan, James; Fink, Jonathan; Charrow, Benjamin; Kumar, Vijay; Ribeiro, Alejandro</i>
5	09:29-09:32	Semi-Autonomous Navigation for Robot Assisted Tele-Echography Using Generalized Shape Models and Co-Registered RGB-D Cameras <i>Zhang, Lin; Lee, Su-Lin; Yang, Guang-Zhong; Mylonas, George</i>	Spherical Parabolic Blends for Robot Workspace Trajectories <i>Dantam, Neil; Stilman, Mike</i>	A Centralized-Equivalent Decentralized Implementation of Extended Kalman Filters for Cooperative Localization <i>Kia, Solmaz; Rounds, Stephen; Martinez, Sonia</i>
6	09:32-09:35	State Recognition of Bone Drilling with Audio Signal in Robotic Orthopedics Surgery System <i>Sun, Yu; Jin, Haiyang; HU, Ying; Zhang, Peng; Zhang, Jianwei</i>	Trajectory Planning for Car-Like Robots in Unknown, Unstructured Environments <i>Fassbender, Dennis; Mueller, Andre; Wuensche, Hans J</i>	From Autonomy to Cooperative Traded Control of Humanoid Manipulation Tasks with Unreliable Communication: System Design and Lessons Learned <i>Mainprice, Jim; Phillips-Grafflin, Calder; Suay, Halit Bener; Alunni, Nicholas; Lofaro, Daniel; Berenson, Dmitry; Chernova, Sonia; Lindeman, Robert; Oh, Paul Y.</i>
7	09:35-09:38	Estimating Contact Force for Steerable Ablation Catheters Based on Shape Analysis <i>Khoshnam Tehrani, Mahta; Patel, Rajnikant V.</i>	Fast, Dynamic Trajectory Planning for a Dynamically Stable Mobile Robot <i>Shomin, Michael; Hollis, Ralph</i>	Route Swarm: Wireless Network Optimization through Mobility <i>Williams, Ryan; Gasparri, Andrea; Krishnamachari, Bhaskar</i>
8	09:38-09:41	Predicting Kinematic Configuration from String Length for a Snake-Like Manipulator Not Exhibiting Constant Curvature Bending <i>Murphy, Ryan Joseph; Otake, Yoshito; Taylor, Russell H.; Armand, Mehran</i>	Risk-Aware Trajectory Generation with Application to Safe Quadrotor Landing <i>Mueller, Joerg; Sukhatme, Gaurav</i>	Cooperative Dynamic Behaviors in Networked Systems with Decentralized State Estimation <i>Sabattini, Lorenzo; Secchi, Cristian; Fantuzzi, Cesare</i>
9	09:41-09:44	Comparison of Methods for Estimating the Position of Actuated Instruments in Flexible Endoscopic Surgery <i>Cabras, Paolo; Goyard, David; Nageotte, Florent; zanne, Philippe; Doignon, Christophe</i>	Hierarchical Robustness Approach for Nonprehensile Catching of Rigid Objects <i>Pekarovskiy, Alexander; Stockmann, Ferdinand; Okada, Masafumi; Buss, Martin</i>	Adding Transmission Diversity to Unmanned Systems through Radio Switching and Directivity <i>Lowrance, Christopher John; Lauf, Adrian P.</i>
10	09:44-09:47	Robust Forceps Tracking Using Online Calibration of Hand-Eye Coordination for Microsurgical Robotic System <i>Tanaka, Shinichi; Baek, Young Min; Harada, Kanako; Sugita, Naohiko; Morita, Akio; Sora, Shigeo; Nakatomi, Hirofumi; Saito, Nobuhito; Mitsuishi, Mamoru</i>	Parameterized Controller Generation for Multiple Mode Behavior <i>Gong, Chaohui; Travers, Matthew; Kao, Hsien-Tang; Choset, Howie</i>	Effective Compression of Range Data Streams for Remote Robot Operations using H.264 <i>Nenci, Fabrizio; Spinello, Luciano; Stachniss, Cyril</i>
11	09:47-09:50	MRI-Powered Closed-Loop Control for Multiple Magnetic Capsules <i>Eqtami, Alina; Felfoul, Ouajdi; Dupont, Pierre</i>	Extending Equilibria to Periodic Orbits for Walkers Using Continuation Methods <i>Rosa, Nelson; Lynch, Kevin</i>	Network Lifetime Maximization in Mobile Visual Sensor Networks <i>Yu, Shengwei; Lee, C. S. George</i>



## Wednesday Session A, 09:00 - 10:20 (Continued)

		Grand Ballroom WeA1	State Ballroom WeA2	Red Lacquer Room WeA3
#	Time	Rehabilitation Robotics II	Planning, Failure Detection and Recovery	Swarm Robotics
12	09:50-09:53	Development and Evaluation of an Operation Interface for Physical Therapy Devices Based on Rehabilitation Database <i>Tsuji, Toshiaki; Momiki, Chinami; Sakaino, Sho</i>	Global Registration of Mid-Range 3D Observations and Short Range Next Best Views <i>Aleotti, Jacopo; Lodi Rizzini, Dario; Monica, Riccardo; Caselli, Stefano</i>	Task Assignment and Trajectory Optimization for Displaying Stick Figure Animations with Multiple Mobile Robots <i>Yamane, Katsu; Goerner, Jared</i>
13	09:53-09:56	EMG-Based Continuous Control Method for Electric Wheelchair <i>Jang, Giho; Choi, Youngjin</i>	Model-Free Robot Anomaly Detection <i>Hornung, Rachel Hannah; Urbaneck, Holger; Klodmann, Julian; Osendorfer, Christian; van der Smagt, Patrick</i>	Worst-Case Optimal Average Consensus Estimators for Robot Swarms <i>Elwin, Matthew; Freeman, Randy; Lynch, Kevin</i>
14	09:56-09:59	NTUH-II Robot Arm with Dynamic Torque Gain Adjustment Method for Frozen Shoulder Rehabilitation <i>Lin, Chia-Hsun; Lien, Wei-Ming; Wang, Wei-Wen; Chen, Sung-Hua; Lo, Chan-Hsiang; Lin, Sheng-Yen; Fu, Li-Chen; Lai, Jin-Shin</i>	A Constraint-Based Method for Solving Sequential Manipulation Planning Problems <i>Lozano-Perez, Tomas; Kaelbling, Leslie</i>	Robust Sensor Cloud Localization from Range Measurements <i>Dubbelman, Gijs; Duisterwinkel, Erik; Demi, Libertario; Talnishnikh, Elena; Wörtche, Heinrich; Bergmans, Jan W. M.</i>
15	09:59-10:02	Involuntary Movement During Haptics-Enabled Robotic Rehabilitation: Analysis and Control Design <i>Atashzar, Seyed Farokh; Saxena, Abhijit; Shahbazi, Mahya; Patel, Rajnikant V.</i>	Attack Resilient State Estimation for Autonomous Robotic Systems <i>Bezzo, Nicola; Weimer, James; Pajic, Miroslav; Sokolsky, Oleg; Pappas, George J.; Lee, Insup</i>	Application of Grazing-Inspired Guidance Laws to Autonomous Information Gathering <i>Apker, Thomas; Liu, Shih-Yuan; Sofge, Donald; Hedrick, Karl</i>
16	10:02-10:05	A Framework for Supervised Robotics-Assisted Mirror Rehabilitation Therapy <i>Shahbazi, Mahya; Atashzar, Seyed Farokh; Patel, Rajnikant V.</i>	A Metric for Self-Rightability and Understanding Its Relationship to Simple Morphologies <i>Kessens, Chad C.; Lennon, Craig; Collins, Jason</i>	Human-Swarm Interaction Using Spatial Gestures <i>Nagi, Jawad; Giusti, Alessandro; Gambardella, Luca; Di Caro, Gianni A.</i>
17	10:05-10:08	Development of an Upper Limb Exoskeleton Powered Via Pneumatic Electric Hybrid Actuators with Bowden Cable <i>Noda, Tomoyuki; Teramae, Tatsuya; Ugurlu, Barkan; Morimoto, Jun</i>	Sampling Based Motion Planning with Reachable Volumes: Application to Manipulators and Closed Chain Systems <i>McMahon, Troy; Thomas, Shawna; Amato, Nancy</i>	Mapping of Unknown Environments Using Minimal Sensing from a Stochastic Swarm <i>Dirafzoon, Alireza; Betthausen, Joseph; Schornick, Jeff; Benavides, Daniel; Lobaton, Edgar</i>
18	10:08-10:11	A Novel Customized Cable-Driven Robot for 3-DOF Wrist and Forearm Motion Training <i>Cui, Xiang; Chen, Weihai; Agrawal, Sunil; Wang, Jianhua</i>	Probabilistically Complete Kinodynamic Planning for Robot Manipulators with Acceleration Limits <i>Kunz, Tobias; Stilman, Mike</i>	Probabilistic Guidance of Distributed Systems Using Sequential Convex Programming <i>Morgan, Daniel; Subramanian, Giri Prashanth; Bandyopadhyay, Saptarshi; Chung, Soon-Jo; Hadaegh, Fred</i>
19	10:11-10:14	Identifying Inverse Human Arm Dynamics Using a Robotic Testbed <i>Scheerer, Eric; Liao, Yu-Wei; Perreault, Eric; Tresch, Matthew; Memberg, William; Kirsch, Robert; Lynch, Kevin</i>	Run-Time Detection of Faults in Autonomous Mobile Robots Based on the Comparison of Simulated and Real Robot Behaviour <i>Millard, Alan Gregory; Timmis, Jon; Winfield, Alan</i>	Geodesic Topological Voronoi Tessellations in Triangulated Environments with Multi-Robot Systems <i>Lee, Seoung Kyou; Fekete, Sándor; McLurkin, James</i>
20	10:14-10:17	A Risk Assessment Infrastructure for Powered Wheelchair Motion Commands without Full Sensor Coverage <i>TalebiFard, Pouria; Sattar, Junaed; Mitchell, Ian</i>	Sampling-Based Tree Search with Discrete Abstractions for Motion Planning with Dynamics and Temporal Logic <i>McMahon, James; Plaku, Erion</i>	Outdoor Flocking and Formation Flight with Autonomous Aerial Robots <i>Vásárhelyi, Gábor; Virágh, Csaba; Somorjai, Gergo; Tarcai, Norbert; Szörényi, Tamás; Nepusz, Tamás; Vicsék, Tamas</i>
21	10:17-10:20	LINarm: a Low-cost Variable Stiffness Device for Upper-limb Rehabilitation <i>Malosio, Matteo; Caimmi, Marco; Legnani, Giovanni; Molinari, Lorenzo</i>	Distributed Fault Detection and Recovery for Networked Robots <i>Arrichiello, Filippo; Marino, Alessandro; Pierri, Francesco</i>	Sponsor Talk: Autonomous Robot Fleets for Automated Warehouses <i>Sweet, Larry Symbolic LLC</i>

## Wednesday Session B, 10:50 - 12:10

		Grand Ballroom WeB1	State Ballroom WeB2	Red Lacquer Room WeB3
		Mechanisms and Actuators & Force and Tactile Sensing	Humanoids and Biped III & Human Detection and Tracking	Collision Detection and Avoidance & Sensing II
	Chair	Okamura, Allison M. (Stanford University)	Bertrand, Sylvain (IHMC)	MacDonald, Bruce (University of Auckland)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	10:50-11:10	Keynote: Natural Machine Motion and Embodied Intelligence <i>Bicchi, Antonio</i> University of Pisa	Keynote on Humanoids and Bipedes <i>Hong, Dennis</i> UCLA	Keynote: Bayesian Perception & Decision From Theory to Real World Applications <i>Laugier, Christian</i> INRIA
		Mechanisms and Actuators	Humanoids and Biped III	Collision Detection and Avoidance
2	11:10-11:13	Dynamic Trajectory Planning of Planar 2-Dof Redundantly Actuated Cable-Suspended Parallel Robots <i>Tang, Lewei; Gosselin, Clement; Tang, Xiaoqiang; Jiang, Xiaoling</i>	3D-SLIP Steering for High-Speed Humanoid Turns <i>Wensing, Patrick; Orin, David</i>	Real-Time Collision Avoidance in Human-Robot Interaction Based on Kinetostatic Safety Field <i>Parigi Polverini, Matteo; Zanchettin, Andrea Maria; Rocco, Paolo</i>
3	11:13-11:16	Workspace Augmentation of Spatial 3-DOF Cable Parallel Robots Using Differential Actuation <i>Khakpour, Hamed; Birglen, Lionel</i>	Emergence of Humanoid Walking Behaviors from Mixed-Integer Model Predictive Control <i>Ibanez, Aurélien; Bidaud, Philippe; Padois, Vincent</i>	Determining States of Inevitable Collision Using Reachability Analysis <i>Lawitzky, Andreas; Nicklas, Anselm; Wollherr, Dirk; Buss, Martin</i>
4	11:16-11:19	Tendon Routing Resolving Inverse Kinematics for Variable Stiffness Joint <i>Shirafuji, Shouhei; Ikemoto, Shuhei; Hosoda, Koh</i>	Trajectory Generation for Continuous Leg Forces During Double Support and Heel-To-Toe Shift Based on Divergent Component of Motion <i>Englsberger, Johannes; Koolen, Twan; Bertrand, Sylvain; Pratt, Jerry; Ott, Christian; Albu-Schäffer, Alin</i>	Collision Prediction among Polygons with Arbitrary Shape and Unknown Motion <i>Lu, Yanyan; Xi, Zhonghua; Lien, Jyh-Ming</i>
5	11:19-11:22	Drum Stroke Variation Using Variable Stiffness Actuators <i>Kim, Yongtae; Garabini, Manolo; Park, Jaeheung; Bicchi, Antonio</i>	Model Preview Control in Multi-Contact Motion - Application to a Humanoid Robot <i>Audren, Hervé; Vaillant, Joris; Kheddar, Abderrahmane; Escande, Adrien; Kaneko, Kenji; Yoshida, Eiichi</i>	Unified GPU Voxel Collision Detection for Mobile Manipulation Planning <i>Hermann, Andreas; Drews, Florian; Bauer, Jörg; Klemm, Sebastian; Roennau, Arne; Dillmann, Rüdiger</i>
6	11:22-11:25	Compliant Robotic Systems on Graphs <i>Groothuis, Stefan S.; Stramigioli, Stefano; Carloni, Raffaella</i>	Predictive Control for Dynamic Locomotion of Real Humanoid Robots <i>Piperakis, Stylianos; Orfanoudakis, Emmanouil; Lagoudakis, Michail</i>	A Practical Reachability-Based Collision Avoidance Algorithm for Sampled-Data Systems: Application to Ground Robots <i>Dabadie, Charles; Kaynama, Shahab; Tomlin, Claire</i>
7	11:25-11:28	Reaching desired states time-optimally from equilibrium and vice versa for visco-elastic joint robots with limited elastic deflection <i>Mansfeld, Nico; Haddadin, Sami</i>	A Robot-Machine Interface for Full-Functionality Automation Using a Humanoid <i>Jeong, Heejin; Shim, David Hyunchul; Cho, Sungwook</i>	Time Scaled Collision Cone Based Trajectory Optimization Approach for Reactive Planning in Dynamic Environments <i>Singh, Arun Kumar; GOPALAKRISHNAN, BHARATH; Krishna, Madhava</i>
8	11:28-11:31	Force-Guiding Particle Chains for Shape-Shifting Displays <i>Lasagni, Matteo; Roemer, Kay</i>	Planar Sliding Analysis of a Biped Robot in Centroid Acceleration Space <i>Senoo, Taku; Ishikawa, Masatoshi</i>	A Representation Method Based on the Probability of Collision for Safe Robot Navigation in Domestic Environments <i>Coenen, Sebastiaan Antonius Maria; Lunenburg, Janno Johan Maria; van de Molengraft, Marinus Jacobus Gerardus; Steinbuch, Maarten</i>
9	11:31-11:34	A Class of Microstructures for Scalable Collective Actuation of Programmable Matter <i>Holobut, Pawel; Kurasa, Michał; Lengiewicz, Jakub</i>	Energy Based Control of Compass Gait Soft Limbed Bipedes <i>Godage, Isuru S.; Wang, Yue; Walker, Ian</i>	Real-Time 3D Collision Avoidance for Biped Robots <i>Hildebrandt, Arne-Christoph; Wittmann, Robert; Wahrmann, Daniel; Ewald, Alexander; Buschmann, Thomas</i>
10	11:34-11:37	HiGen: A High-Speed Genderless Mechanical Connection Mechanism with Single-Sided Disconnect for Self-Reconfigurable Modular Robots <i>Parrott, Christopher; Dodd, T J; Gross, Roderich</i>	Analytical Control Parameters of the Swing Leg Retraction Method using an Instantaneous SLIP Model <i>Shemer, Natan; Degani, Amir</i>	Ensuring Safety in Human-Robot Coexistence Environment <i>Tsai, Chi-Shen; Hu, Jwu-Sheng; Tomizuka, Masayoshi</i>
11	11:37-11:40	Stretchable Electroadhesion for Soft Robots <i>Germann, Juerg Markus; Schubert, Bryan; Floreano, Dario</i>	Task-Oriented Whole-Body Planning for Humanoids Based on Hybrid Motion Generation <i>Cognetti, Marco; Mohammadi, Pouya; Oriolo, Giuseppe; Vendittelli, Marilena</i>	A Unified Framework for External Wrench Estimation, Interaction Control and Collision Reflexes for Flying Robots <i>Tomic, Teodor; Haddadin, Sami</i>

## Wednesday Session B, 10:50 - 12:10 (Continued)

		Grand Ballroom WeB1	State Ballroom WeB2	Red Lacquer Room WeB3
#	Time	Force and Tactile Sensing	Human Detection and Tracking	Sensing II
12	11:40-11:43	Miniature Capacitive Three-Axis Force Sensor <i>Bekhti, Rachid; Duchaine, Vincent; Cardou, Philippe</i>	Real-Time People Detection and Tracking for Indoor Surveillance Using Multiple Top-View Depth Cameras <i>Tseng, Ting-En; Liu, An-Sheng; Hsiao, Po-Hao; Huang, Cheng-Ming; Fu, Li-Chen</i>	Deterioration of Depth Measurements Due to Interference of Multiple RGB-D Sensors <i>Martín Martín, Roberto; Lorbach, Malte; Brock, Oliver</i>
13	11:43-11:46	A Framework for Dynamic Sensory Substitution <i>Mkhitaryan, Artashes; Burschka, Darius</i>	Robot-Assisted Human Indoor Localization Using the Kinect Sensor and Smartphones <i>Jiang, Chao; Fahad, Muhammad; Guo, Yi; Yang, Jie; Chen, Yingying</i>	IMU/LIDAR Based Positioning of a Gangway for Maintenance Operations on Wind Farms <i>merriaux, Pierre; Boutteau, Rémi; Vasseur, Pascal; Savatier, Xavier</i>
14	11:46-11:49	High-Throughput Analysis of the Morphology and Mechanics of Tip Growing Cells Using a Microrobotic Platform <i>Felekis, Dimitrios; Vogler, Hannes; Mecja, Geraldo; Muntwyler, Simon; Sakar, Mahmut Selman; Grossniklaus, Ueli; Nelson, Bradley J.</i>	Gesture-Based Attention Direction for a Telepresence Robot: Design and Experimental Study <i>Tee, Keng Peng; Yan, Rui; Chua, Yuanwei; Huang, Zhiyong; Liemhetcharat, Somchaya</i>	A Quantitative Evaluation of Surface Normal Estimation in Point Clouds <i>Jordan, Krzysztof; Mordohai, Philippos</i>
15	11:49-11:52	What's in the Container? Classifying Object Contents from Vision and Touch <i>Güler, Püren; Bekiroglu, Yasemin; Kragic, Danica; Gratal Martínez, Xavi; Pauwels, Karl</i>	Kinect-Based People Detection and Tracking from Small-Footprint Ground Robots <i>Pesenti Gritti, Armando; Tarabini, Oscar; Guzzi, Jerome; Di Caro, Gianni A.; caglioti, vincenzo; Gambardella, Luca; Giusti, Alessandro</i>	View Planning for 3D Object Reconstruction with a Mobile Manipulator Robot <i>Vasquez-Gomez, J. Irving; Sucar, Luis Enrique; Murrieta-Cid, Rafael</i>
16	11:52-11:55	3D Spatial Self-Organization of a Modular Artificial Skin <i>Mittendorfer, Philipp; Dean-Leon, Emmanuel; Cheng, Gordon</i>	Robust Articulated Upper Body Pose Tracking under Severe Occlusions <i>Sigalas, Markos; Pateraki, Maria; Trahanias, Panos</i>	Planar Pose Estimation for General Cameras Using Known 3D Lines <i>Miraldo, Pedro; Araujo, Helder</i>
17	11:55-11:58	Detection of Membrane Puncture with Haptic Feedback Using a Tip-Force Sensing Needle <i>Elayaperumal, Santhi; Bae, Jung Hwa; Daniel, Bruce; Cutkosky, Mark</i>	Pedestrian Detection Combining RGB and Dense LIDAR Data <i>Premebida, Cristiano; Carreira, Joao Luis da Silva; Batista, Jorge; Nunes, Urbano</i>	GPS-Based Preliminary Map Estimation for Autonomous Vehicle Mission Preparation <i>Dupuis, Yohan; merriaux, Pierre; Subirats, Peggy; Boutteau, Rémi; Savatier, Xavier; Vasseur, Pascal</i>
18	11:58-12:01	Active Gathering of Frictional Properties from Objects <i>Rosales, Carlos; Ajoudani, Arash; Gabiccini, Marco; Bicchi, Antonio</i>	Confidence-Based Pedestrian Tracking in Unstructured Environments Using 3D Laser Distance Measurements <i>Häselich, Marcel; Jöbgen, Benedikt; Wojke, Nicolai; Hedrich, Jens; Paulus, Dietrich</i>	Dynamic Objects Tracking with a Mobile Robot Using Passive UHF RFID Tags <i>Liu, Ran; Huski&amp;#263; Goran; Zell, Andreas</i>
19	12:01-12:04	Localization and Manipulation of Small Parts Using GelSight Tactile Sensing <i>Li, Rui; Platt, Robert; Yuan, Wenzhen; ten Pas, Andreas; Roscup, Nathan; Srinivasan, Mandayam; Adelson, Edward</i>	Whole-Body Pose Estimation in Physical Rider-Bicycle Interactions with a Monocular Camera and a Set of Wearable Gyroscopes <i>Lu, Xiang; Yu, Kaiyan; Zhang, Yizhai; Yi, Jingang; Liu, Jingtai</i>	Spatio-Temporal Motion Features for Laser-Based Moving Objects Detection and Tracking <i>Shen, Xiaotong; Kim, Seong-Woo; Ang Jr, Marcelo H</i>
20	12:04-12:07	Exploiting Global Force Torque Measurements for Local Compliance Estimation in Tactile Arrays <i>Ciliberto, Carlo; Fiorio, Luca; Maggiali, Marco; Natale, Lorenzo; Rosasco, Lorenzo; Metta, Giorgio; SANDINI, GIULIO; Nori, Francesco</i>	Pedalvatar: An IMU-Based Real-Time Body Motion Capture System Using Foot Rooted Kinematic Model <i>Zheng, Yang; Chan, Ka Chun; Wang, Charlie C.L.</i>	The Role of Target Modeling in Designing Search Strategies <i>Renzaglia, Alessandro; Noori, Narges; Isler, Volkan</i>
21	12:07-12:10	Toward a Modular Soft Sensor-Embedded Glove for Human Hand Motion and Tactile Pressure Measurement <i>Hammond III, Frank L.; Menguc, Yigit; Wood, Robert</i>	Sponsor Talk: TOYOTA - Partner Robot <i>Djugash, Joseph</i> Toyota Motor Eng. & Manuf. North America	Advances in Fibrillar On-Off Polymer Adhesive: Sensing and Engagement Speed <i>Wettels, Nicholas; Parness, Aaron</i>

## Wednesday Session C, 14:00 - 15:20

		Grand Ballroom WeC1 Surgical Robotics II & Teleoperation and Telerobotics	State Ballroom WeC2 Learning by Demonstration & Industrial and Manufacturing Robotics	Red Lacquer Room WeC3 Localization and Mapping IV & Locomotion, Navigation, and Mobility
	Chair	Hamel, William R. (University of Tennessee)	Parker, Lynne (University of Tennessee)	Antonelli, Gianluca (Univ. of Cassino and S. Lazio)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	14:00-14:20	Keynote: Surgical Robotics: Transition to Automation <i>Hannaford, Blake</i> University of Washington	Keynote: Machine Learning of Motor Skills for Robotics <i>Peters, Jan</i> TU Darmstadt	Keynote: Toward Persistent SLAM in Challenging Environments <i>Eustice, Ryan</i> University of Michigan
		Surgical Robotics II	Learning by Demonstration	Localization and Mapping IV
2	14:20-14:23	Bimanual Telerobotic Surgery with Asymmetric Haptic Force Feedback: A Davinci Surgical System Implementation <i>Mohareri, Omid; Schneider, Caitlin; Salcudean, Septimiu E.</i>	A Robust Autoregressive Gaussian Process Motion Model Using L1-Norm Based Low-Rank Kernel Approximation <i>Kim, Eunwoo; Choi, Sungjoon; Oh, Songhwa</i>	Simultaneous Localization and Planning on Multiple Map Hypotheses <i>Morris, Timothy; Dayoub, Feras; Corke, Peter; Upcroft, Ben</i>
3	14:23-14:26	First 3D Printed Medical Robot for ENT Surgery - Application Specific Manufacturing of Laser Sintered Disposable Manipulators <i>Entsfellner, Konrad; Kuru, Ismail; Maier, Thomas; Gumprecht, Jan David Jerome; Lueth, Tim C.</i>	Unifying Scene Registration and Trajectory Optimization for Learning from Demonstrations with Application to Manipulation of Deformable Objects <i>Lee, Alex Xavier; Huang, Sandy; Hadfield-Menell, Dylan; Tzeng, Eric; Abbeel, Pieter</i>	Long-Term Topological Localisation for Service Robots in Dynamic Environments Using Spectral Maps <i>Krajník, Tomás; Pulido Fentanes, Jaime; Martínez Mozos, Oscar; Duckett, Tom; Ekekrantz, Johan; Hanheide, Marc</i>
4	14:26-14:29	Mass and Inertia Optimization for Natural Motion in Hands-On Robotic Surgery <i>Petersen, Joshua; Rodriguez y Baena, Ferdinando</i>	Robot Learns Chinese Calligraphy from Demonstrations <i>Sun, Yuandong; QIAN, Huihuan; Xu, Yangsheng</i>	SAIL-MAP: Loop-Closure Detection Using Saliency-Based Features <i>BIREM, Merwan; QUINTON, Jean-Charles; berry, francois; Mezouar, Youcef</i>
5	14:29-14:32	Interleaved Continuum-Rigid Manipulation Approach: Development and Functional Evaluation of a Clinical Scale Manipulator <i>Conrad, Benjamin; Zinn, Michael</i>	Learning to Sequence Movement Primitives from Demonstrations <i>Manschitz, Simon; Kober, Jens; Gienger, Michael; Peters, Jan</i>	Visual Place Recognition using HMM Sequence Matching <i>Hansen, Peter; Browning, Brett</i>
6	14:32-14:35	Using Monocular Images to Estimate Interaction Forces During Minimally Invasive Surgery <i>Noohi, Ehsan; Parastegari, Sina; Zefran, Milos</i>	Kinematically Optimised Predictions of Object Motion <i>Belter, Dominik; Wyatt, Jeremy; Kopicki, Marek; Zurek, Sebastian</i>	Linear-Time Estimation with Tree Assumed Density Filtering and Low-Rank Approximation <i>Ta, Duy-Nguyen; Dellaert, Frank</i>
7	14:35-14:38	Recursive Estimation of Needle Pose for Control of 3D Ultrasound-Guided Robotic Needle Steering <i>Adebar, Troy K.; Okamura, Allison M.</i>	Program Synthesis by Examples for Object Repositioning Tasks <i>Feniello, Ashley; Dang, Hao; Birchfield, Stan</i>	Large-Scale Image Mosaicking Using Multimodal Hyperedge Constraints from Multiple Registration Methods within the Generalized Graph SLAM Framework <i>Pfingsthorn, Max; Birk, Andreas; Ferreira, Fausto; Veruggio, Gianmarco; Caccia, Massimo; Bruzzone, Gabriele</i>
8	14:38-14:41	Development of Multi-Axial Force Sensing System for Haptic Feedback Enabled Minimally Invasive Robotic Surgery <i>Lee, Dong-Hyuk; Kim, Uikyum; Choi, Hyouk Ryeol</i>	LAT: A Simple Learning from Demonstration Method <i>Reiner, Benjamin; Ertel, Wolfgang; Posenauer, Heiko; Schneider, Markus</i>	Localization Algorithm Based on Zigbee Wireless Sensor Network with Application to an Active Shopping Cart <i>Gai, Shengnan; Jung, Eui-jung; Yi, Byung-Ju</i>
9	14:41-14:44	Estimation of Needle Tissue Interaction Based on Non-Linear Elastic Modulus and Friction Force Patterns <i>Elgezua Fernandez, Inko; Kobayashi, Yo; Fujie, Masakatsu G.</i>	Discovering Task Constraints through Observation and Active Learning <i>Hayes, Bradley; Scassellati, Brian</i>	RF Odometry for Localization in Pipes Based on Periodic Signal Fadings <i>Rizzo, Carlos; Kumar, Vijay; Lera, Francisco; Villarreal, José Luis</i>
10	14:44-14:47	Design and Realization of Grasper-Integrated Force Sensor for Minimally Invasive Robotic Surgery <i>Kim, Uikyum; Lee, Dong-Hyuk; Choi, Hyouk Ryeol; Moon, Hyungpil; Koo, Ja Choon</i>	Unsupervised Object Individuation from RGB-D Image Sequences <i>Koo, Seongyong; Lee, Dongheui; Kwon, Dong-Soo</i>	Multi-Vehicle Localisation with Additive Compressed Factor Graphs <i>Toohey, Lachlan; Pizarro, Oscar; Williams, Stefan Bernard</i>
11	14:47-14:50	A Biomechanical Model Describing Tangential Tissue Deformations During Contact Micro-Probe Scanning <i>Rosa, Benoit; Morel, Guillaume; Szewczyk, Jérôme</i>	Grasp Planning Based on Strategy Extracted from Demonstration <i>Lin, Yun; Sun, Yu</i>	Building Local Terrain Maps Using Spatio-Temporal Classification for Semantic Robot Localization <i>Laible, Stefan; Zell, Andreas</i>

## Wednesday Session C, 14:00 - 15:20 (Continued)

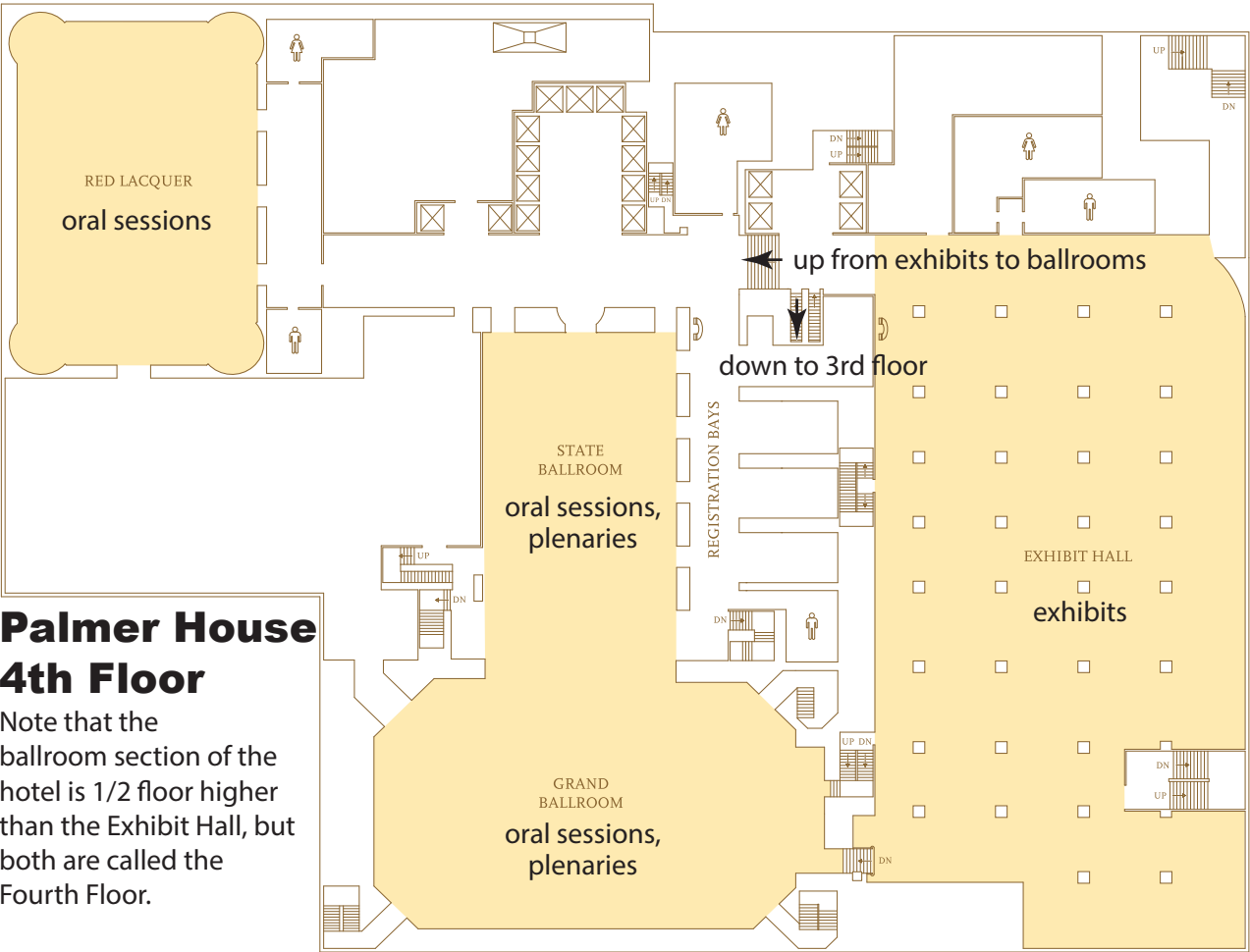
		Grand Ballroom WeC1	State Ballroom WeC2	Red Lacquer Room WeC3
#	Time	Teleoperation and Telerobotics	Industrial and Manufacturing Robotics	Locomotion, Navigation, and Mobility
12	14:50-14:53	Industrial Robotic Assembly Process Modeling Using Support Vector Regression <i>Li, Binbin; Chen, Heping; Jin, Tongdan</i>	Stiffness Modeling of Industrial Robots for Deformation Compensation in Machining <i>Schneider, Ulrich; Momeni, Mahdi; Ansaloni, Matteo; Verl, Alexander</i>	HexaMorph: A Reconfigurable and Foldable Hexapod Robot Inspired by Origami <i>Gao, Wei; Huo, Ke; Seehra, Jasjeet Singh; Ramani, Karthik; Cipra, Raymond</i>
13	14:53-14:56	Teleoperation System Using past Image Records for Mobile Manipulator <i>Murata, Ryosuke; Songtong, Sira; Mizumoto, Hisashi; Kon, Kazuyuki; Matsuno, Fumitoshi</i>	A Study on Data-Driven In-Hand Twisting Process Using a Novel Dexterous Robotic Gripper for Assembly Automation <i>Chen, Fei; Cannella, Ferdinando; Canali, Carlo; Hauptman, Travelet; Sofia, Giuseppe; Caldwell, Darwin G.</i>	On the Optimal Selection of Motors and Transmissions for Electromechanical and Robotic Systems <i>Rezazadeh, Siavash; Hurst, Jonathan</i>
14	14:56-14:59	Experimental Evaluation of Guidance and Forbidden Region Virtual Fixtures for Object Telemanipulation <i>King, H. Hawkeye; Hannaford, Blake</i>	Velocity Coordination and Corner Matching in a Multi-Robot Sewing Cell <i>Schrimpf, Johannes; Bjerkeng, Magnus; Mathisen, Geir</i>	Active Behavior of Musculoskeletal Robot Arms Driven by Pneumatic Artificial Muscles for Receiving Human's Direct Teaching Effectively <i>Ikemoto, Shuhei; Kayano, Yuji; Hosoda, Koh</i>
15	14:59-15:02	Investigating Human Perceptions of Robot Capabilities in Remote Human-Robot Team Tasks Based on First-Person Robot Video Feeds <i>Canning, Cody; Donahue, Thomas; Scheutz, Matthias</i>	On the Location of the Center of Mass for Parts with Shape Variation <i>Panahi, Fatemeh; van der Stappen, Frank</i>	Received Signal Strength Based Bearing-Only Robot Navigation in a Sensor Network Field <i>Deshpande, Nikhil; Grant, Edward; Draelos, Mark; Henderson, Thomas C.</i>
16	15:02-15:05	Know Thy User: Designing Human-Robot Interaction Paradigms for Multi-Robot Manipulation <i>Lewis, Bennie; Sukthankar, Gita</i>	Design and Motion Planning of Body-In-White Assembly Cells <i>Pellegrinelli, Stefania; Pedrocchi, Nicola; Molinari Tosatti, Lorenzo; Fischer, Anath; Tollo, Tullio A. M.</i>	GeckoGripper: A Soft, Inflatable Robotic Gripper Using Gecko-Inspired Elastomer Micro-Fiber Adhesives <i>Song, Sukho; Majidi, Carmel; Sitti, Metin</i>
17	15:05-15:08	Modeling Visuo-Motor Control and Guidance Functions in Remote-Control Operation <i>Andersh, Jonathan; Li, Bin; Mettler, Berenice</i>	Cartesian Sensor-Less Force Control for Industrial Robots <i>Cho, Hyunchul; Kim, Min Jeong; Lim, Hyunkyuu; Kim, Donghyeok</i>	Design and Architecture of a Series Elastic Snake Robot <i>Rollinson, David; Bilgen, Yigit; Brown, H. Ben; Enner, Florian; Ford, Steven; Layton, Curtis; Rembisz, Justine; Schwerin, Michael; Willig, Andrew; Velagapudi, Prasanna; Choset, Howie</i>
18	15:08-15:11	Transparency Compensation for Bilateral Teleoperators with Time-Varying Communication Delays <i>Rodriguez-Seda, Erick J.</i>	Improving the Sequence of Robotic Tasks with Freedom of Execution <i>Alatartsev, Sergey; Ortmeier, Frank</i>	Hybrid Unmanned Aerial Underwater Vehicle: Modeling and Simulation <i>Drews Jr, Paulo; Alves Neto, Armando; Campos, Mario Montenegro</i>
19	15:11-15:14	Model-Free Path Planning for Redundant Robots Using Sparse Data from Kinesthetic Teaching <i>Seidel, Daniel; Emmerich, Christian; Steil, Jochen J.</i>	Parallel Active/Passive Force Control of Industrial Robots with Joint Compliance <i>Dayal, Udai, Arun; Hayat, Abdullah Aamir; Saha, Subir Kumar</i>	Circumnavigation by a Mobile Robot Using Bearing Measurements <i>Zheng, Ronghao; Sun, Dong</i>
20	15:14-15:17	Learning Task Outcome Prediction for Robot Control from Interactive Environments <i>Haidu, Andrei; Daniel, Kohlsdorf; Beetz, Michael</i>	Automated Guidance of Peg-In-Hole Assembly Tasks for Complex-Shaped Parts <i>Song, Hee-Chan; Kim, Young-Loul; Song, Jae-Bok</i>	
21	15:17-15:20		Intuitive Skill-Level Programming of Industrial Handling Tasks on a Mobile Manipulator <i>Pedersen, Mikkel Rath; Herzog, Dennis Levin; Krueger, Volker</i>	

## Wednesday Session D, 15:50 - 17:10

		Grand Ballroom WeD1 Micro-Nano Robots II & Impedance, Compliance, and Force Control	State Ballroom WeD2 Unmanned Aerial Systems II & Legged Robots II	Red Lacquer Room WeD3 Computer Vision II & Recognition
Chair		Sun, Dong (City University of Hong Kong)	Carloni, Raffaella (University of Twente)	Martinet, Philippe (Ecole Centrale de Nantes)
#	Time	Session Keynote	Session Keynote	Session Keynote
1	15:50-16:10	Keynote: Soft, printable, and small: an overview of manufacturing methods for novel robots at Harvard <i>Wood, Robert</i> Harvard University	Keynote: Material-Handling - Paradigms for Humanoids and UAVs <i>Oh, Paul Y.</i> University of Nevada, Las Vegas (UNLV)	Keynote: Semantic Parsing in Indoors and Outdoors Environments <i>Kosecka, Jana</i> George Mason University
		Micro-Nano Robots II	Unmanned Aerial Systems II	Computer Vision II
2	16:10-16:13	Modeling and experiments of high speed magnetic micromanipulation at the air/liquid interface <i>Dkhil, Mohamed; Bolopion, Aude; Gauthier, Michael; Régnier, Stéphane</i>	Robust Attitude Controller for Uncertain Hexarotor Micro Aerial Vehicles (MAVs) <i>Derawi, Dafzal; Salim, Nurul Dayana; Zamzuri, Hairi; Liu, Hao; Abdul Rahman, Mohd Azizi; Mazlan, Saiful Amri</i>	A Model-Free Approach for the Segmentation of Unknown Objects <i>ASIF, UMAR; Bennamoun, Mohammed; Sohel, Ferdous</i>
3	16:13-16:16	Assembly and Mechanical Characterizations of Polymer Microhelical Devices <i>Alvo, Sébastien; Decanini, Dominique; Couraud, Laurent; Haghiri-Gosnet, Anne-Marie; Hwang, Gilgueng</i>	Emergency Landing for a Quadrotor in Case of a Propeller Failure: A Backstepping Approach <i>Lippiello, Vincenzo; Ruggiero, Fabio; Serra, Diana</i>	Automatic Detection of Pole-Like Structures in 3D Urban Environments <i>Tombari, Federico; Fioraio, Nicola; Cavallari, Tommaso; Salti, Samuele; Petrelli, Alioscia; Di Stefano, Luigi</i>
4	16:16-16:19	Controllable Roll-To-Swim Motion Transition of Helical Nanoswimmers <i>Barbot, Antoine; Folio, David; Ferreira, Antoine</i>	Guaranteed Road Network Search with Small Unmanned Aircraft <i>Dille, Michael; Grocholsky, Ben; Singh, Sanjiv</i>	Real-Time and Low Latency Embedded Computer Vision Hardware Based on a Combination of FPGA and Mobile CPU <i>Honegger, Dominik; Oleynikova, Helen; Pollefeys, Marc</i>
5	16:19-16:22	Three Dimensional Rotation of Bovine Oocyte by using Magnetically Driven On-chip Robot <i>Feng, Lin; U, Ningga; Turan, Bilal; Arai, Fumihito</i>	A Ground-Based Optical System for Autonomous Landing of a Fixed Wing UAV <i>Kong, Weiwei; Zhou, Dianle; Zhang, Yu; Zhang, Daibing; Wang, Xun; Zhao, Boxin; Yan, Chengping; Shen, Lincheng; Zhang, Jianwei</i>	Multi-View Terrain Classification Using Panoramic Imagery and LIDAR <i>Taghavi Namin, Sarah; Najafi, Mohammad; Petersson, Lars</i>
6	16:22-16:25	Robust Nanomanipulation Control Based on Laser Beam Feedback <i>Amari, Nabil; Folio, David; Ferreira, Antoine</i>	On Crop Height Estimation with UAVs <i>Anthony, David; Elbaum, Sebastian; Lorenz, Aaron; Detweiler, Carrick</i>	Efficient Real-Time Loop Closure Detection Using GMM and Tree Structure <i>BOULEKCHOUR, MOHAMMED; Aouf, Nabil</i>
7	16:25-16:28	Microrobotic Platform for Mechanical Stimulation of Swimming Microorganism on a Chip <i>Ahmad, Belal; Kawahara, Tomohiro; Yasuda, Takashi; Arai, Fumihito</i>	Model-Aided State Estimation for Quadrotor Micro Air Vehicles Amidst Wind Disturbances <i>Abeywardena, Dinuka; Wang, Zhan; Dissanayake, Gamini; Waslander, Steven Lake; Kodagoda, Sarath</i>	Place Categorization using Sparse and Redundant Representations <i>Carrillo, Henry; Latif, Yasir; Neira, José; Castellanos, Jose A.</i>
8	16:28-16:31	Magnetic-Based Motion Control of Sperm-Shaped Microrobots Using Weak Oscillating Magnetic Fields <i>Khalil, Islam S.M.; Youakim, Kareem; Sanchez Secades, Luis Alonso; Misra, Sarthak</i>	Inspection of Pole-Like Structures Using Vision-Controlled VTOL UAV and Shared Autonomy <i>Sa, Inkyu; Hrabar, Stefan; Corke, Peter</i>	Real-Time Global Localization of Intelligent Road Vehicles in Lane-Level Via Lane Marking Detection and Shape Registration <i>Cui, Dixiao; Xue, Jianru; Du, Shaoyi; Zheng, Nanning</i>
9	16:31-16:34	On-Chip Flexible Scaffold for Construction of Multishaped Tissues <i>Chumtong, Puwanan; Kojima, Masaru; Horade, Mitsuhiro; Ohara, Kenichi; Kamiyama, Kazuto; Mae, Yasushi; Akiyama, Yoshikatsu; Yamato, Masayuki; Arai, Tatsuo</i>	Image-Based Control for Dynamically Cross-Coupled Aerial Manipulation <i>Mebarki, Rafik; Lippiello, Vincenzo; Siciliano, Bruno</i>	On-Road Vehicle Detection through Part Model Learning and Probabilistic Inference <i>Wang, Chao; Zhao, Huijing; Guo, Chunzhao; Mita, Seiichi; Zha, Hongbin</i>
10	16:34-16:37	Cell Isolation System for Rare Circulating Tumor Cell <i>Masuda, Taisuke; Sun, Yiling; Song, Woneui; Niimi, Miyako; Yusa, Akiko; Hayao, Nakanishi; Arai, Fumihito</i>	The Quadroller: Modeling of a UAV/UGV Hybrid Quadrotor <i>Page, Jared; Pounds, Paul</i>	Real-time Depth Enhanced Monocular Odometry <i>Zhang, Ji; Kaess, Michael; Singh, Sanjiv</i>
11	16:37-16:40	Incorporating In-Situ Force Sensing Capabilities in a Magnetic Microrobot <i>Jing, Wuming; Cappelleri, David</i>	Persistent monitoring with a team of autonomous gliders using static soaring <i>Acevedo, José Joaquín; Lawrance, Nicholas Robert Jonathon; Arrue, Begoña C.; Sukkarieh, Salah; Ollero, Anibal</i>	MEVO: Multi-Environment Stereo Visual Odometry <i>Koletschka, Thomas; Puig, Luis; Daniilidis, Kostas</i>

## Wednesday Session D, 15:50 - 17:10 (Continued)

		Grand Ballroom WeD1	State Ballroom WeD2	Red Lacquer Room WeD3
#	Time	Impedance, Compliance, and Force Control	Legged Robots II	Recognition
12	16:40-16:43	Joint Space Torque Controller Based on Time-Delay Control with Collision Detection <i>Hur, Sung-moon; Oh, Sang-Rok; Oh, Yonghwan</i>	Compliant Terrain Legged Locomotion Using a Viscoplastic Approach <i>Vasilopoulos, Vasileios; Paraskevas, Iosif S.; Papadopoulos, Evangelos</i>	Place Recognition and Self-Localization in Interior Hallways by Indoor Mobile Robots: A Signature-Based Cascaded Filtering Framework <i>Ahmad Yousef, Khalil; Park, Johnny; Kak, Avinash</i>
13	16:43-16:46	Force/vision Control for Robotic Cutting of Soft Materials <i>Long, Philip; Khalil, Wisama; Martinet, Philippe</i>	Passive Dynamic Walking of Compass-Like Biped Robot with Dynamic Absorbers <i>Akutsu, Yukihiro; Asano, Fumihiko; Tokuda, Isao</i>	Automated Perception of Safe Docking Locations with Alignment Information for Assistive Wheelchairs <i>Jain, Siddharth; Argall, Brenna</i>
14	16:46-16:49	Hierarchical Inequality Task Specification for Indirect Force Controlled Robots Using Quadratic Programming <i>Lutscher, Ewald; Cheng, Gordon</i>	More Solutions Means More Problems: Resolving Kinematic Redundancy in Robot Locomotion on Complex Terrain <i>Satzinger, Brian; Reid, Jason; Bajracharya, Max; Hebert, Paul; Byl, Katie</i>	Terrain Classification Using Laser Range Finder <i>Walas, Krzysztof, Tadeusz; Nowicki, Michal</i>
15	16:49-16:52	Fast Dual-Arm Manipulation Using Variable Admittance Control: Implementation and Experimental Results <i>Bjerkeng, Magnus; Schrimpf, Johannes; Myhre, Torstein; Pettersen, Kristin Y.</i>	Hopping Control for the Musculoskeletal Bipedal Robot BioBiped <i>Ahmad Sharbafi, Maziar; Radkhah, Katayon; von Stryk, Oskar; Seyfarth, Andre</i>	A Novel Feature for Polyp Detection in Wireless Capsule Endoscopy Images <i>Yuan, Yixuan; Meng, Max Q.-H.</i>
16	16:52-16:55	External Torque Sensing Algorithm for Flexible-Joint Robot Based on Disturbance Observer Structure <i>Park, Young Jin; Chung, Wan Kyun</i>	A Passive Dynamic Quadruped That Moves in a Large Variety of Gaits <i>Gan, Zhenyu; Remy, C. David</i>	Automation of "Ground Truth" Annotation for Multi-View RGB-D Object Instance Recognition Datasets <i>Aldoma, Aitor; Fulhammer, Thomas; Vincze, Markus</i>
17	16:55-16:58	Implicit Force Control for an Industrial Robot with Flexible Joints and Flexible Links <i>Rossi, Roberto; Bascetta, Luca; Rocco, Paolo</i>	Velocity Disturbance Rejection for Planar Bipedes Walking with HZD-Based Control <i>Post, David; Schmiedeler, James</i>	Recognition of Inside Pipeline Geometry by Using PSD Sensors for Autonomous Navigation <i>Choi, Yun Seok; Kim, Ho Moon; Suh, Jung Seok; Mun, Hyeong Min; Yang, Seung Ung; Park, Chan Min; Choi, Hyouk Ryeol</i>
18	16:58-17:01	Cartesian Space Synchronous Impedance Control of Two 7-DOF Robot Arm Manipulators <i>Jin, Minghe; Zhang, Zijian; Ni, Fenglei; Liu, Hong</i>	Reactive Posture Behaviors for Stable Legged Locomotion Over Steep Inclines and Large Obstacles <i>Roennau, Arne; Heppner, Georg; Nowicki, Michal; Zollner, Johann Marius; Dillmann, Rudiger</i>	Large Scale Place Recognition in 2D LIDAR Scans Using Geometrical Landmark Relations <i>Himstedt, Marian; Hartmann, Jan; Hellbach, Sven; Boehme, Hans-Joachim; Maehle, Erik</i>
19	17:01-17:04	Fully Omnidirectional Compliance in Mobile Robots Via Drive-Torque Sensor Feedback <i>Kim, Kwan Suk; Kwok, Alan; Thomas, Gray; Sentis, Luis</i>	The Effect of Leg Impedance on Stability and Efficiency in Quadrupedal Trotting <i>Bosworth, William; Kim, Sangbae; Hogan, Neville</i>	Evaluation of Feature Selection and Model Training Strategies for Object Category Recognition <i>Ali, Haider; Marton, Zoltan-Csaba</i>
20	17:04-17:07	Augmenting Impedance Control with Structural Compliance for Improved Contact Transition Performance <i>Kim, Dongwon; Gillespie, Brent; Johnson, Brandon</i>	On the Energetics of Quadrupedal Bounding with and without Torso Compliance <i>Cao, Qu; Poulakakis, Ioannis</i>	Automatic Segmentation and Recognition of Human Activities from Observation Based on Semantic Reasoning <i>Ramirez-Amaro, Karinne; Beetz, Michael; Cheng, Gordon</i>
21	17:07-17:10	Fuzzy Learning Variable Admittance Control for Human-Robot Cooperation <i>Dimeas, Fotios; Aspragathos, Nikos A.</i>	On the Dynamics of a Quadruped Robot Model with Impedance Control: Self-Stabilizing High Speed Trot-Running and Period-Doubling Bifurcations <i>Lee, Jongwoo; Hyun, Dong Jin; Ahn, Joeeun; Kim, Sangbae; Hogan, Neville</i>	Detection of Liquids in Cups Based on the Refraction of Light with a Depth Camera Using Triangulation <i>Hara, Yoshitaka; Honda, Fuhito; Tsubouchi, Takashi; Ohya, Akihisa</i>



### Palmer House 4th Floor

Note that the ballroom section of the hotel is 1/2 floor higher than the Exhibit Hall, but both are called the Fourth Floor.

### 3rd Floor

Note that the Crystal Room section of the hotel is 1/2 floor higher than the Interactive Salons, but both are called the Third Floor.

Lower-numbered papers in an oral session can be found in lower-numbered salons during the subsequent interactive sessions. For example, papers 2 and 3 in Track 3 (Red Lacquer Room) can be found in Salon 7, while papers 19 and 20 can be found in Salon 12.

