The 4th Humanoid Robot Application Challenge

Organizer: Jacky Baltes (National Taiwan Normal University)

Local Organizer: Young-Jae Ryoo (Mokpo National University)

Apart from the competition, the idea of the application challenge is to encourage novel and innovative applications for humanoid robots and to provide for teams to present their ideas even if they many not be completely developed yet in an entertaining setting. So one goal is to provide an open and friendly forum to discuss ideas and research in humanoid robotics. Therefore, one of the features of the IROS 2016 4th Humanoid Robot Application Challenge is that the challenge rules are defined in broad terms only and judging is based on a team of experts and the other participants. The theme for the IROS 2016 4th Humanoid Application Challenge is Robot Magic. The idea is to develop applications that use the humanoid robot as magician, assistant, or prop of a magical performance. Robot Magic is an interesting research topics as it covers many areas of current research into robotics such as dexterous manipulation (e.g., card tricks), human robot interaction (e.g., misdirections or forcing a card), and robot vision (e.g, peeks, memory tricks). But it also requires great presentation and showmanship to create a successful and entertaining illusion. As an added bonus, the event also includes short demonstrations of some of the HuroCup (h ttp://www.facebook.com/groups/hurocup) events: sprint, wall climbing, and basketball. We believe that the competition as well as the demonstrations are highly entertaining and will attract many conference attendees to watch the event and interact with the participants.

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IROS 2016 Autonomous Drone Racing Challenge

Organizers: Hyungpil Moon (Sungkyunkwan University), Hyunchul Shim (KAIST)

Autonomous Drone Racing in Mos Espa Daejeon Arena

URL: http://ris.skku.edu/home/iros2016racing.html

Drone racing is getting popular as a new-generation hobby and also as a rising professional racing sport. Recent drone racing games show the agility of the drone flying through a zigzaging, narrow, confined racing circuit. An onboard camera and the head-mount display goggle provides pilots First Person View (FPV) and pilots show their amazing control techniques during the racing. In contrast, autonomous drone flight through such a daring environment at high speed still remains as a difficult challenge. Nonetheless, drones that can negotiate with complex surroundings can be not only as a sport but a killer app for future drone applications, where drones can fly through obstacles and search for survivors in a scene of accident and more.

The IROS 2016 Autonomous Drone Racing in Mos Espa Daejeon Arena (Racing) is a technical challenge sponsored by Korea Ministry of Trade, Industry and Energy aimed to provide worldwide robotic researchers a technology showroom for autonomous flight and to promote solutions for agile autonomous flight of drones in daring environments. Participants will bring their own flying robots in Mos Espa Daejeon Arena and be asked to fly them autonomously through designated tracks in the circuit. The technical challenges combine the time optimal path planning for drones, flight and tracking control, obstacle detection, localization, and fault detection and recovery. Two racing times will be recorded and scored by its best flight time through the start and the finish line. Depending on the number of participants, Racing will be divided into two divisions; one is the onboard computing (Division A) and the other is the remote computing (Division B).

Participating teams are

(Division A)

1. Team MAV-lab, Delft University of Technology
Members: Guido de Croon, Roland Meertens, Ewoud Smeur, Sjoerd Tijmons, Matej Karasek, Chrisophe de Wagter, Li Shuo, Coen de Visser, Isabella Haij

2. Team UNIST Autonomous Robots, UNIST
Members: TszChiu Au, Dung Nguyen, Dohee Lee

3. Team UVify, Uvify Inc.
Members: Hyon Lim, Chulwoo Park, Mr. Kyunghyun Lee

4. Team ETHZ ASL/ADRL, Autonomous Systems Lab, ETH Zurich
Members: Roland Siegwart, Jonas Buchli, Mina Kamel, Michael Burri, Helen Oleynikova, Fadri Furrer, Michael Neunert

5. Team IFM Technologies
Members: Marc Gyongyosi, Justin Saeheng, Siddarth Jain, Nathan Matsuda

6. Team KIRD (Kaist Indoor Racing Drone), KAIST
Members: David Hyunchul Shim, Sunggoo Jung, Hanseob Lee, Jaehyun Lee, HyunGi Kim, Jaemin Kang, Dasol Lee, HeeMin Shin

(Division B)
1. Team Coanda, Sungkyunkwan University, IRMS Lab
Members: Hyoukryeol Choi , Seunghwan Song, Hyunwook Shon

2. Fast Eagle
Members: Max Q.-H. Meng, Wang Chaoqun, Zhu Delong, Li Hongxiang, Lin Yuan, Du Yegui, Song Shian

3. Team RISE, Sungkyunkwan University, RISE Lab
Members: Hyungpil Moon , Geonuk Lee, Jeongmin Jeon, Yochan Min, SungJu Lee, Hong-ryul Jung, Seokwon Kim, Kihun Kim, Soonpyo Kwon, Dong-cheol Park, Dongyoon Shin, So-mi Park, JinKyum Kim
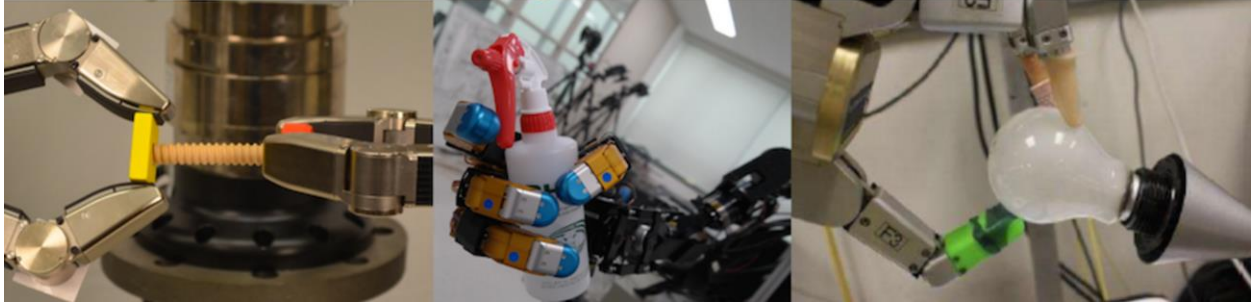
Robotic Grasping and Manipulation Competition

Organizing Committee: Yu Sun, Nadia Cheng, Hyouk Ryeol Choi, Zoe Doulgeri, Erik D. Engeberg, Kris Hauser, Joseph Falco, Nancy Pollard, Maximo Roa, Fuchun Sun, Zeyang Xia

URL: http://www.rhgm.org/activities/competition_iros2016/

The Robotic Grasping and Manipulation Competition has three different tracks: Track 1: Hand-in-hand grasping, Track 2: Fully autonomous, Track 3: Simulation.

There are two stages for each track: stage 1: pick-and-place; stage 2: manipulation. The objects in the pick-and-place stage are listed at http://www.rhgm.org/activities/competition_iros2016/objects_published.pdf. The manipulation tasks are list at http://www.rhgm.org/activities/competition_iros2016/tasks_published.pdf.
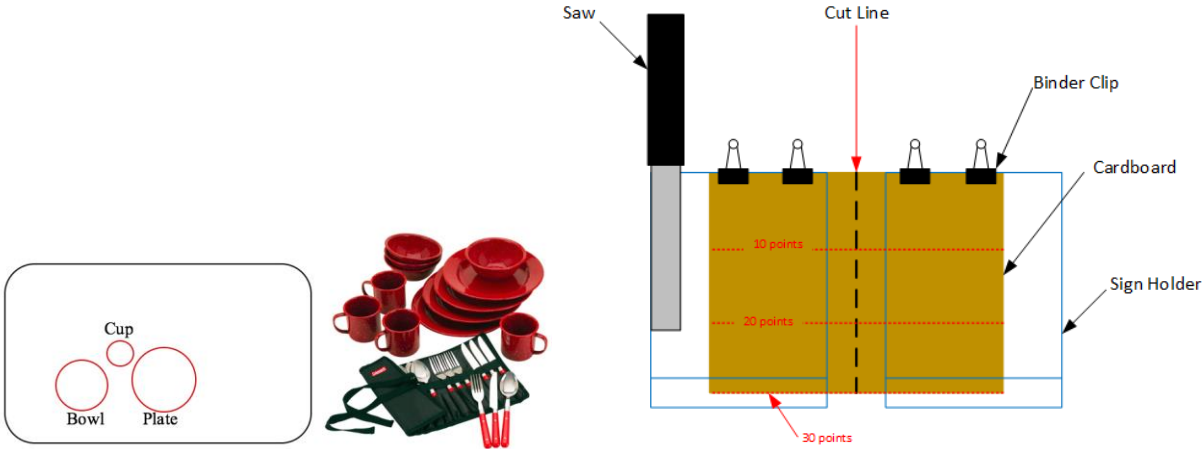
There are eight teams in the competition. They are

1. Team: Dorabot&Cobot
Members: Zhikang Wang, Shuo Liu, Zhe Hu, Mingu Kwon, Dandan Zhou, Yi Xu, Zhongtao Fu, Miao Li, and Hao Zhang
Hardware: Dorabot
Track 1, 2, and 3

2. Team: George Mason University
Members: Eadom Dessalene, Daniel Lofaro, and Jana Kosecka
Hardware: Baxter and Allegro Hand
Track 2

3. Team: Northeastern University
Members: Lina HAO, Hui YANG Yang CHEN Shao Fei GUO Yan Lei MA
Hardware: IPMC robotic arm
Track 1 and 2

4. Team: Sungkyunkwan University
Members: Dongmin Choi, Byungjin Jung.
Hardware: SKKU Arm and Hand
Track 2

5. Team: Tsinghua University
Members: Bin Fang, Di Guo, Tao Kong, Jingming Xuan.
Hardware: Tsinghua robotic arm and hand
Track 1 and 2

6. UNIPI-IIT-QB Team
Members: Antonio Bicchi, Manuel Catalano, Mateo Bianchi, Giorgio Grioli, Manolo
Garabini, Alessio Rocchi, Edoardo Farnioli, Hamal Marino, Manuel Bonilla, Cristina
Piazza, Cosimo Della Santina, Emmanuele Luberto, Gaspare Santaera, Alberto Brando,
Fabio Bonomo, Alessandro Raugi.
Hardware: Pisa/IIT SoftHand
Track 1

7. Team: University of Colorado at Boulder
Members: Radhen Patel, Jorge Canardo Alastuey, Dr. Jacob Segil, Prof. Nikolaus
Correll
Hardware: Robotic Arm: Kinova Jaco Arm, Robotic Hand: Motion Control ETD
Track 2

8. University of Tulsa
Members: Dipayan Das, Nathanael Rake, Dr. Joshua Schultz
Hardware: Tulsa hand
Track 1