

## **Workshop on Robotic Manipulation of Deformable Objects (ROMADO)**

**2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)**

Novel solutions for the robotic manipulation of deformable objects can enable new real-world tasks in sectors of strategic interest. These include the manufacturing industry, agriculture, or medicine. However, deformable objects are complex to model and require the manipulation system to have high adaptability and the ability to operate under uncertainty. These are important challenges and, although exciting progress has been made over the past years, there remain many open technical questions in this area regarding perception, planning and control. This workshop brings together researchers to showcase recent work, explore connections between the targeted topics of interest and spark discussion about current and future research in the area.

This video is an introduction to the workshop with information on its program, which consists of a series of talks from invited speakers and contributed paper authors.

### **Organizers**

Miguel Aranda (SIGMA Clermont, Institut Pascal)

Juan Antonio Corrales (SIGMA Clermont, Institut Pascal)

Pablo Gil (Universidad de Alicante)

Gonzalo López-Nicolás (Universidad de Zaragoza)

Helder Araujo (Universidade de Coimbra)

Youcef Mezouar (SIGMA Clermont, Institut Pascal)

Workshop's website: <http://commandia.unizar.es/irosworkshop2020/>

The contact email for any questions is: [romadoworkshop@gmail.com](mailto:romadoworkshop@gmail.com)

The conference website is: <https://www.iros2020.org/>

## Invited talks

*Invited Talk 1:* “Controlled within-hand sliding”

**Berk Calli**, Worcester Polytechnic Institute

*Invited Talk 2:* “Deformable object interaction and contact-rich tasks”

**Danica Kragic and Ioanna Mitsioni**, KTH Royal Institute of Technology

*Invited Talk 3:* “On feedback features for shape control of deformable objects”

**David Navarro-Alarcon**, The Hong Kong Polytechnic University

*Invited Talk 4:* “Grasp synthesis of articulated objects with  $n$  links”

**Raúl Suárez**, UPC

*Invited Talk 5:* “Integrating soft robots with the sense of touch”

**Kaspar Althoefer**, Queen Mary University of London

*Invited Talk 6:* “Multi-robot motion planning and coordination for object transport in dynamic environments”

**Javier Alonso-Mora**, Delft University of Technology

*Invited Talk 7:* “Multimodal planning and control for dexterous manipulation of challenging objects”

**Véronique Perdereau**, Sorbonne Université

*Invited Talk 8:* “From human haptic illusions on soft objects to robotic object recognition and slip detection”

**Zhanat Kappassov**, Nazarbayev University

*SIGMA Clermont / Institut Pascal:* “Recent work on deformable object manipulation”

## Contributed paper talks

*Paper 1:* "Dual-armed manipulation planning for tethered tools" by Daniel Sanchez, Weiwei Wan and Kensuke Harada

*Paper 2:* "Prediction of tactile perception from vision on deformable objects" by Brayan S. Zapata-Impata and Pablo Gil

*Paper 3:* "Shape control of elastoplastic deformable linear objects through reinforcement learning" by Rita Laezza and Yiannis Karayiannidis

*Paper 4:* "Interaction identification through tactile sensing during cloth manipulation using a 3-axis touch sensor" by Idril Geer, Marc Maceira, Julia Borrás, Carme Torras and Guillem Alenya

*Paper 5:* "Toward a general framework for 3D deformable object grasping and manipulation" by Felix Nadon, Angel J. Valencia, Narmadha Sambandam, Stephen Rowlands, James Dickens and Pierre Payeur

*Paper 6:* "Experimental multi-camera setup for perception of dynamic objects" by Rafael Herguedas, Gonzalo Lopez-Nicolas and Carlos Sagues

*Paper 7:* "Real-time state estimation of deformable objects with dynamical simulation" by Shiyu Jin, Changhao Wang, Xinghao Zhu, Te Tang and Masayoshi Tomizuka

-----

This workshop received support from the IEEE RAS Technical Committee on Robotic Hands, Grasping, and Manipulation and from the IEEE RAS Technical Committee on Multi-Robot Systems.

The organization of this workshop is supported by project COMMANDIA (SOE2/P1/F0638), which is cofinanced by Interreg Sudoe Programme (European Regional Development Fund).