March – 2019

COMMANDIA NEWSLETTER

http://commandia.unizar.es

Collaborative Robotic Mobile Manipulation of Deformable Objects in Industrial Applications

October 14, 2018

COMMANDIA comic

A brief comic introducing COMMANDIA project

October 19, 2018

INESCOP in Futurmoda

INESCOP and RED 21 presented a new scanner at Futurmoda: INESCOP and RED 21, under the concept of "Industrial digitalization and product conceptualization", presented in IFA (Alicante) during the 17th and 18th of October in the Futurmoda fair, a scanner for the computer design of footwear floors.

INESCOP has developed a set of CAD/CAM tools to meet the needs of the footwear sector in terms of design and manufacture of floors, increasing productivity and efficiency, while reducing errors relating to the transfer of information between the different agents involved in the manufacturing process of floors.

October 19, 2018

Project COMMANDIA in European Cooperation Day

On 21 September 2018, The municipality of Alicante organised an event for citizens and local actors to show what "European territorial cooperation" really means. In order to do so, Interreg funds were presented along with real European projects promoting cooperation in different fields. José Francisco Gómez (INESCOP) presented project COMMANDIA during the event. The European Cooperation Day is celebrated all over Europe and beyond on 21 September every year, promoting achievements of cooperation among regions.

January 13, 2019

Paper: Learning Spatio Temporal Tactile Features with a ConvLSTM for the Direction Of Slip Detection

Title: Learning Spatio Temporal Tactile Features with a ConvLSTM for the Direction Of Slip Detection
Author: Zapata-Impata, Brayan S. and Gil, Pablo and Torres, Fernando
Journal: Sensors 2019, 19(3), 523
Abstract: Robotic manipulators have to constantly deal with the complex task of detecting whether a grasp is stable or, in contrast, whether the grasped object is slipping. Recognising the type of slippage—translational, rotational—and its direction is more challenging than detecting only stability, but is simultaneously of greater use as regards correcting the aforementioned grasping issues. In this work, we propose a learning methodology for detecting the direction of a slip (seven categories) using spatio-temporal tactile features learnt from one tactile sensor. Tactile readings are, therefore, pre-processed and fed to a ConvLSTM that learns to detect these directions with just 50 ms of data. We have extensively evaluated the performance of the system and have achieved relatively high results at the detection of the direction of slip on unseen objects with familiar properties (82.56% accuracy).
Paper download

Sponsoring: Project COMMANDIA (SOE2/P1/F0638) is partially supported by Interreg Sudoe Programme and European Regional Development Fund (ERDF).

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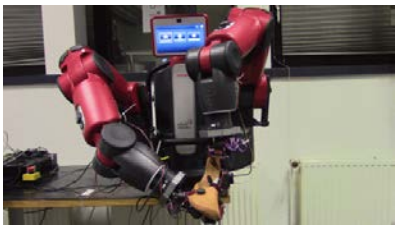
January 30, 2019

A picture illustrating the technological basis of our approach in the COMMANDIA project:



February 7, 2019

6ème journée mobilité innovante – Robotique coopérative pour la transitique : convoyage, transfert, manipulation

LabEx IMobS3, the ViaMéca competitiveness cluster, the I-SITE CAP 20-25 and the regional cluster Coboteam proposed this year to devote their event to innovative robotics solutions for workflow.

Location: Cézeaux Campus, Clermont- Ferrand, France.

Among users, productive environments are particularly targeted: industry (manufacturing, food, pharmaceuticals…) and also agriculture, construction, mining and construction… Logistics, order preparation, distribution, etc. are also concerned, as are more specific intra-logistics (hospitals, services, etc.). Users will report successful deployments and integrations and their feedback will motivate new initiatives. The technological (unlocking, innovation), economic (return on investment, Robotics As A Service…), or human (acceptance, change management…) aspects can be addressed. Solution and technology providers, design offices, engineers and integrators, laboratories, will showcase their innovative know-how with regard to the state of the art.

Our colleagues Juan Antonio Corrales and Miguel Aranda presented different works at the "26ème journée mobilité innovante" about collaborative robotics with industrial applications in the framework of COMMANDIA project.

February 13, 2019

Paper: Fast geometry-based computation of grasping points on three-dimensional point clouds

Title: Fast geometry-based computation of grasping points on three-dimensional point clouds

Author: Brayan S Zapata-Impata, Pablo Gil, Jorge Pomares, Fernando Torres
Journal: International Journal of Advanced Robotic Systems, January-February 2019: 1–18,

Abstract: Industrial and service robots deal with the complex task of grasping objects that have different shapes and which are seen from diverse points of view. In order to autonomously perform grasps, the robot must calculate where to place its robotic hand to ensure that the grasp is stable. We propose a method to find the best pair of grasping points given a three-dimensional point cloud with the partial view of an unknown object. We use a set of straightforward geometric rules to explore the cloud and propose grasping points on the surface of the object. We then adapt the pair of contacts to a multi-fingered hand used in experimentation. We prove that, after performing 500 grasps of different objects, our approach is fast, taking an average of 17.5 ms to propose contacts, while attaining a grasp success rate of 85.5%. Moreover, the method is sufficiently flexible and stable to work with objects in changing environments, such as those confronted by industrial or service robots.
Download paper

Sponsoring: Project COMMANDIA (SOE2/P1/F0638) is partially supported by Interreg Sudoe Programme and European Regional Development Fund (ERDF).

February 13, 2019

Paper: 3DCNN Performance in Hand Gesture Recognition Applied to Robot Arm Interaction

Title: 3DCNN Performance in Hand Gesture Recognition Applied to Robot Arm Interaction
Author: Castro-Vargas, J., Zapata-Impata, B., Gil, P., Garcia-Rodriguez, J. and Torres, F.
Conference: In Proceedings of the 8th International Conference on Pattern Recognition Applications and Methods – Volume 1, 2019: ICPRAM, ISBN 978-989-758-351-3, pages 802-806.

Abstract: In the past, methods for hand sign recognition have been successfully tested in Human Robot Interaction (HRI) using traditional methodologies based on static image features and machine learning. However, the recognition of gestures in video sequences is a problem still open, because current detection methods achieve low scores when the background is undefined or in unstructured scenarios. Deep learning techniques are being applied to approach a solution for this problem in recent years. In this paper, we present a study in which we analyse the performance of a 3DCNN architecture for hand gesture recognition in an unstructured scenario. The system yields a score of 73% in both accuracy and F1. The aim of the work is the implementation of a system for commanding robots with gestures recorded by video in real scenarios.
Download paper

Sponsoring: Project COMMANDIA (SOE2/P1/F0638) is partially supported by Interreg Sudoe Programme and European Regional Development Fund (ERDF).