

# Learning to throw complex deformable objects

Tutor: Guillem Alenyà and Adrià Colomé

Group: Robot Perception and Manipulation at IRI (RobIRI)

Location: Carrer de Llorens i Artigas, 4-6, 08028 Barcelona (Spain)

## Abstract

In the warehouse logistics of fashion industries often items come inside plastic bags, that need to be distributed in different directions in the warehouse, being picked, distributed in bins, stored, etc. Observing humans, an efficient way to pick and place could be by throwing the items in different bins. This allows improved speed, almost at human capacity. However, this is complex for deformable objects because the dynamics involved in the motion make pre-planned trajectories ineffective.

In this project, the student will work on the testing and development of a robotic system consisting of a robotic arm that can grasp plastic bags that contain folded clothes, and throw them into different bins. The student will explore the use of reinforcement learning techniques to learn object and robot dynamics and trajectories. The project has a practical component, and the student will have the opportunity to work in collaboration with an important industrial partner in the fashion sector interested in solving this problem.

The project has a duration of 9 months that will allow the student to learn new techniques and to train and evaluate the solution in realistic scenarios.

**Keywords**— Learning, dynamics, robotics