An Autonomous and Flexible Robotic Framework for Logistics Applications

In this paper, we present an intelligent and flexible framework for autonomous pick-and-place tasks in previously unknown scenarios. It includes modules for object recognition, environment modeling, motion planning and collision avoidance, as well as sophisticated error handling and a task supervisor. The framework combines state-of-the-art algorithms and was validated during the first phase of the European Robotics Challenge in which it obtained first place in a field of 39 international contestants. We discuss our results and the potential application of our framework to real industrial tasks. Furthermore, we validate our approach with an application on a real harvesting manipulator. To inspire other teams participating in the challenge and as a tool for new researchers in the field, we release it as open source.

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