Post-Doctoral position

Control of robotic arms for cooperative manipulations

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DESCRIPTION

- Scientific description

Robot manipulators are extensively used in a great variety of industrial contexts ranging from automated production lines to teleoperations. The accomplishment of complex tasks can require the cooperation of multiple robot manipulators in a highly constrained environment [1], [2]. From rendezvous problems to cooperative manipulation and transportation of a single object by several robot manipulators, robust Model Predictive Control (MPC) has emerged as the predominant technique to deal with constraints applying on both a single agent and the multi-agent system.

The aim of this post-doctoral position is twofold. The first objective addresses both modeling and control of a system of collaborative robotic arms. Centralized/decentralized/distributed MPC approaches will be investigated to ensure a high level of performance while guaranteeing safe object manipulations in a highly constrained environment (including, e.g., smooth maneuvers and obstacles avoidance). The second objective embraces the implementation and experimental validation of the developed control schemes on a system of two collaborative robotic arms.

- Desired experience

  - Ph.D. in control, preferably with major in the analysis and control of robotics systems;
  - Familiarity with the robotics suite Robot Operating Systems (ROS);
  - Strong scientific culture assessed by publications in leading international journals and conferences;
  - Familiarities and interest in intelligent autonomous systems would be appreciated.

- Acquired skills during this post-doctoral position

The successful candidate will acquire through this post-doctoral position solid knowledges in the fields of cooperative control of multi-agent dynamical systems, as well as a strong experience on manipulating robotic platforms. This should provide the successful candidate with an opening to areas that are currently at the forefront of academic research, as well as research and development. This post-doctoral position has the advantage of combining deep explorations into theoretical fields along with the experimental implementation and validation of the developed control laws on a system of two collaborative robotic arms.

- Keywords

  Robotic manipulators, Cooperative control, Model Predictive Control, Multi-Agent Systems.

- Bibliography


Work place

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Application procedure

CV, cover letter, publications list and contact details of two references by e-mail to hugo.lhachemi@l2s.centralesupelec.fr

General information

1-year post-doctoral position starting from September 2021
*(Framework: L2S call for projects 2021)*

Application deadline

1st June, 2021 (23:30 Paris local time)