

# Human factors and motion planning in cooperative tasks with a collaborative industrial robot

Record number : OPR-531

## Overview

### RESEARCH DIRECTOR

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### Information

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### ADMINISTRATIVE UNIT(S)

Faculty of Engineering  
Department of Electrical and Computer Engineering  
Interdisciplinary Institute for Technological Innovation

### LEVEL(S)

Master's degree  
Ph.D.

### LOCATION(S)

Campus principal  
3IT - Institut interdisciplinaire d'innovation technologique

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## Project Description

Several factors need to be considered during an interaction between a human and a collaborative industrial robot. Among all the security constraints associated with the use of robots in a human environment, the psychological effects should not be neglected. In this thesis, we plan to investigate the comfort and awareness factors that affect the performance of a human collaborating or working near a collaborative robot in an industrial environment. We also plan to study how to model the comfort (physical and behavioral) criteria associated with human-industrial robot collaborative tasks. To build this model, we envision to explore several approaches (e.g., deterministic, stochastic, temporal logic theory, deep learning), and study how to combine these approaches with the spatio-temporal information from the robot's local sensors. Once the factors are identified, we plan to integrate them into a motion planning algorithm. The factors will be transformed into objective functions to be maximized or minimized during the motion. Validation tests on the robots Baxter and Sawyer will be conducted to validate the developed approaches, and the results to be published in top-tier robotics conferences and journals.

## Discipline(s) by sector

### Natural Sciences and Engineering

Electrical Engineering and Electronic Engineering

## Funding offered

Yes

The last update was on 1 February 2021. The University reserves the right to modify its projects without notice.