

Physics-based learning for smarter motion controllers

Record number : OPR-164

Overview

RESEARCH DIRECTOR

Alexandre Girard, Professeur - Department of Mechanical Engineering

Information

alexandre.girard2@usherbrooke.ca

ADMINISTRATIVE UNIT(S)

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

LEVEL(S)

Master's degree
Ph.D.
Postdoctoral Fellowship

LOCATION(S)

Campus principal
3IT - Institut interdisciplinaire d'innovation technologique

Project Description

In many areas, autonomous robots have the potential for improving task efficiency, safety and releasing humans of mundane repetitive tasks, for instance transportation (self-driving cars), mining (autonomous trucks, robotized excavation), agriculture, inspection, surveillance and even home use (autonomous vacuum cleaners and lawn mowers). The more uncertain and unstructured the environment is, higher capabilities are required for the system to be autonomous and not require a constant human supervision and frequent interventions. Achieving autonomy in complex environments is a challenge at many levels: perception, cognition, controls, etc.

The proposed projects are part of a research program aiming at making robots more autonomous, agile and versatile, by investigating ways to include learning in the low-level motion controllers so that their "motor skills" can improve over time and adapt to new situations. Multiple sub-projects are available, for either MS or PhD thesis. Small-scale autonomous vehicles will be used to conduct outdoor experiments to test the novel control schemes.

Discipline(s) by sector

Natural Sciences and Engineering

Electrical Engineering and Electronic Engineering, Mechanical Engineering

Funding offered

Yes

The last update was on 24 November 2020. The University reserves the right to modify its projects without notice.