Control of a mobile robotic system for sanding drywall

Record number : OPR-615

Overview

RESEARCH DIRECTION

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ADMINISTRATIVE UNIT(S)

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Département de génie mécanique
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LEVEL(S)

2e cycle

LOCATION(S)

3IT - Institut interdisciplinaire d'innovation technologique

Project Description

R.C.M. Modular inc. manufactures living modules for the residential, commercial and industrial market. These modules consist of drywall to which a coating is applied to hide cracks. This coating is then sanded to level the surfaces. However, this step is particularly time consuming, in addition to producing a large amount of fine particles, which can be disturbing in the long term for the worker. We therefore propose to design a robot capable of taking charge of this sanding step following a minimum of instructions from its operator. While sanding robots already exist in the manufacturing industry, it will have the particularity of being mobile in addition to being able to automatically detect the surfaces to be treated and plan its task. This detection and planning will be cross-validated by the operator, who will be able to make corrections using a man-machine interface or by moving the robot by physical contact. The project will therefore have to explore the state of the art of the detection of the composition of surfaces by studying different sensor technologies, integrate a force control allowing the application of the pressure necessary for sanding, and be usable by a non-expert operator. The project offered for a master's student is to develop the algorithms to control the movement of the robot as well as the force applied by the robot for sanding to obtain an acceptable quality of finish. The student will work with an existing team that will deal with the perceptions algorithms and the mechanical prototyping.

Keywords: Robot, controls, actuators, impedance/admittance control.

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Discipline(s) by sector

Sciences naturelles et génie

Génie électrique et génie électronique,
Génie mécanique

Funding offered

Yes

Partner(s)

RCM Modulaire Inc.

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