Innovative Solutions Canada Program

Challenge EN578-170003/21: Improving Robot-Environment Interaction
Attachment 1
Question and Answer #1

This document contains questions and answers related to this challenge.

Question #1:

Is this project about developing a complete robot or only an actuator? The requirements seem to apply to either one or the other, without actually specifying which one is the focus of the project. For the purpose of asking my questions, I assume this is about developing an entire robot.

- The mechanism is expected to be a 3+ DoF robot. Must this robot be serial or can it be a parallel mechanism?

- Aside from applying constant pressure on "variable" surfaces, must the robot also be able to do things like grasping?

-What are conditions under which the (<1mm) defection should be measured? At rest, during motion, while applying force to a surface? At full reach or in any typical configuration?

- The essential outcome saying: "Be available in a compact form so as to easily actuate a robotic rotational joint. "Is confusing. Shouldn't the solution have 3 robotic joints in order to have 3 degrees of freedom?

- Are the cited 10cmX10cmX10cm dimensions actual strict requirements or just ballpark indications? (For an actuator, these dimensions would make sense, but not for a 3DoF robot)

- I assume the suggested output nominal torques are for the actuators. Are there requirements regarding the output force that can be applied by the 3DoF mechanism's end-effector?

- What is considered robust? Still working after impact? Non-interrupted functioning even during the impact?

Response #1:

The proposal clearly states: "This challenge therefore seeks a system allowing a robot to apply adequate forces and torques when interacting with a human or an environment with changing conditions."

It is therefore not a robot per se. An actuator might be a solution, and so could other mechanical systems allowing force or torque generation over various ranges. This is an innovation program. We stayed away from predefined solutions.

 As all other questions were asked in the context of building an entire robot (For the purpose of asking my questions, I assume this is about developing an entire robot.), they are not applicable.