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Image-based Control for Cable-based Robots

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Abstract: Some human robot interactive applications involved in tele-robotics, remote supervisory andunmanned systems require specific capabilities. This demand has promoted various interactive modesand high-level control techniques such as tele-manipulation, speech, vision, gesture, etc. Among theseinteractive modes, the image based control which is often named point and click control has proven tobe the most appropriate one that offers multiple advantages. This mode consists of only and simplypointing in an appearing object of an image received from a remote site, to convert this click into a robotcommand towards the corresponding location in the real world space. This mode is suitable for remoteapplications, frees the human operator from being involved into the loop enabling him/her to usecommands in the sense of click and forget. This paper presents, firstly, the design and the realization ofan experimental planar cable-based robot constituted of four cables. Secondly, it presents the designand the implementation of a high-level image-based control. Some typical experiments which havebeen performed prove the simplicity and the effectiveness of the image-based control. Moreover, itopens perspectives for new applications with cable-based robots, particularity for rehabilitation applications.

Keywords : Cable-based robot, human-robot interaction, image-based control, point and click, robot control.