

Image-based Control for Cable-based Robots

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

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