

Haptic Robotic Glove for Tele-Exploration of Explosive Devices

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Abstract : ABSTRACT HAPTIC ROBOTIC GLOVE FOR TELE-EXPLORATION OF EXPLOSIVE DEVICES Gizem Derya Demir, İlayda Yankılıç, Dağlar Karamüftüoğlu, Dante J. Dorantes-González Department of Mechanical Engineering, MEF University Ayazağa Cad. No.4, 34396 Maslak, Sarıyer, İstanbul, Turkey Nowadays, terror attacks are, unfortunately, a more common threat around the world. Therefore, safety measures have become much more essential. An alternative to providing safety and saving human lives is done by robots, such as disassembling and liquidation of bombs. In this article, remote exploration and manipulation of potential explosive devices from a safe-distance are addressed by designing a novel, simple and ergonomic haptic robotic glove. SolidWorks® Computer-Aided Design, computerized dynamic simulation, and MATLAB® kinematic and static analysis were used for the haptic robotic glove and finger design. Angle controls of servo motors were made using ARDUINO® IDE codes on a Makeblock® MegaPi control card. Simple grasping dexterity solutions for the fingers were obtained using one linear soft and one angle sensors for each finger, and six servo motors are used in total to remotely control a slave multi-tooled robotic hand. This project is still undergoing and presents current results. Future research steps are also presented.

Keywords : Dexterity, Exoskeleton, Haptics , Position Control, Robotic Hand , Teleoperation

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