World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Effective Virtual Tunnel Shape for Motion Modification in Upper-Limb Perception-Assist with a Power-Assist Robot

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Abstract : In the case of physically weak persons, not only motor abilities, but also sensory abilities are sometimes deteriorated. The concept of perception-assist has been proposed to assist the sensory ability of the physically weak persons with a power-assist robot. Since upper-limb motion is very important in daily living, perception-assist for upper-limb motion has been proposed to assist upper-limb motion in daily living. A virtual tunnel was applied to modify the user's upper-limb motion if it was necessary. In this paper, effective shape of the virtual tunnel which is applied in the perception-assist for upper-limb motion is proposed. Not only the position of the grasped tool but also the angle of the grasped tool are modified if it is necessary. Therefore, the upper-limb motion in daily living can be effectively modified to realize certain proper daily motion. The effectiveness of the proposed virtual tunnel was evaluated by performing the experiments.

Keywords : motion modification, power-assist robots, perception-assist, upper-limb motion
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020