Estimation of Finger Motion based on Electromechanical Sensing of Wrist Shape

○ Junki Kawaguchi¹, Shunsuke Yoshimoto¹, Yoshihiro Kuroda², Osamu Oshiro¹

¹Graduate School of Engineering Science, Osaka University, Osaka, Japan, ²Cybermedia Center, Osaka University, Osaka, Japan

Developing a ubiquitous hand motion sensing system is valuable for understanding biomechanism and developing Human Computer Interface. Unless to the traditional hand motion sensing technologies which impose the mechanical constriction to user’s motion, we have developed an obtrusive hand motion sensing system focusing on the interlocked musculoskeletal structure. The proposed system detects electrically the changes of wrist shape related to the finger motion and estimates finger joint angles by using a multiple regression model. The wristband device with multiple electrodes converts the finger motion to the changes of electrical contact resistance. The parameters of multiple regression model are optimized by using the outputs form the system and a calibrated data glove. The visualization of the estimated finger posture during open-close movement of the hand showed a good result of the estimation. This paper reports the evaluation of the estimated errors of joint angles for several subjects.