Commanding in robot teleoperation system can be done in several ways, including the use of sign language. In this paper, the use of centroid distance Fourier descriptors as hand shape descriptor in sign language recognition from visually captured hand gesture is considered. The sign language adopts the American Sign Language finger spelling. Only static gestures in the sign language are used. To obtain hand images, depth imager is used in this research. Hand image is extracted from depth image by applying threshold operation. Centroid distance signature is constructed from the segmented hand contours as a shape signature. Fourier transformation of the centroid distance signature results in fourier descriptors of the hand shape. The fourier descriptors of hand gesture are then compared with the gesture dictionary to perform gesture recognition. The performance of the gesture recognition using different distance metrics as classifiers is investigated. The test results show that the use of 15 Fourier descriptors and Manhattan distance-based classifier achieves the best recognition rates of 95% with small computation latency about 6.0573 ms. Recognition error is occurred due to the similarity of Fourier descriptors from some gesture.
Sign Language Recognition in Robot Teleoperation using Centroid Distance Fourier Descriptors

References


Index Terms
Keywords
Hand Gesture  Sign Language  Fingerspelling  Cefd  Fourier Descriptor