

Evaluation of a commercial force sensor for real time applications

ABSTRACT

A commercial piezoresistive FlexiForce sensor can be of great interest in biomedical robotic applications due not only to its advantageous material which will not be affected by metallic and ferromagnetic materials but to its dimension as well. In this paper, the evaluation of FlexiForce sensor is performed in the case of grasping robotic hand glove for medical application. The evaluation method is done through a dynamic calibration based on three experimental tests which are performed with different calibration features to accurately identify the behaviour of force sensor over time. Our empirical evaluation shows that the method used is computationally efficient, and that it has advantages over the traditional method. Quantitative results show and identify the characteristics of the force sensor pattern including the systematic errors such as lack of linearity, hysteresis and non-repeatability. The proposed method is a useful approach for evaluating the performance of any measurement force sensor in real time environments.

Keyword: Force sensor; Real time applications; Force measurement system; Grasping robotic hand; Evaluation; Dynamic calibration