

## **Experimental and analysis study on glovemaps grasping force signal using Gaussian filtering method and principal component analysis (PCA)**

### **Abstract**

This research paper presents the analysis study of human grasping forces for several objects by using a DataGlove called GloveMAP. The grasping force is generated from the bending of proximal and intermediate phalanges of the fingers when touching with a surface. A flexiforce sensor is installed at the finger's position of the GloveMAP. The acquired grasping force signals are filtered by using a Gaussian filtering for the purpose of removing noises. A Principal Component Analysis technique (PCA) is employed to reduce the dimension of the grasping force signal, and follows by the extraction of its features. In the experiment, five subjects are selected to perform the grasping activities. The experimental results show that the Gaussian filter could be used to smoothen the grasping force signals. Moreover, the first and the second principal components of PCA could be used to extract features of grasping force signals.

**Keywords** — Eigenfingers, gaussian filter, grasping force, principal component