

Abstract

Hand gesture detection with a smartwatch can be used as a smart lighting control on the internet of things (IoT) environment using machine learning techniques such as support vector machine (SVM). However, several parameters affect the SVM model's performance and need to be evaluated. This study evaluates the parameters in building an SVM model for hand gesture detection in intelligent lighting control. In this study, eight gestures were defined to turn on and off four different lights, and then the data were collected through a smartwatch with an Inertial Measurement Unit (IMU) sensor. Feature selection using Pearson Correlation is then carried out on 36 features extracted from each gesture data. Finally, two sets of gestures were compared to evaluate the effect of gesture selection on model performance. The first set of gestures shows that the accuracy of 10 features compared to the accuracy of 36 features is 94% compared to 71%, respectively. Furthermore, the second set of gestures has an accuracy lower than the first set of gestures, which is 64%. Results show that the lower the number of features, the better the accuracy. Then, the set of gestures that are not too distinctive show lower accuracy than the highly distinctive gesture sets. The conclusion is, in implementing gesture detection with SVM, low data dimensions need to be maintained through feature selection methods, and a distinctive set of gesture selection is required for a model with good performance..

Keywords: Smart Lighting, Smartwatch, Inertial Measurement Unit, Support Vector Machine, Pearson Correlation
