

Abstract

The use of faces in a system has a vulnerability to spoofing attacks, because the techniques used to carry out attacks are simple and cheap. In this research, we proposed a spoofing attack detection system on human face that can be distinguished whether it's spoof or non-spoof image using LDP (Local Derivative Pattern) method as feature extraction. For the classifier, we use k-Nearest Neighbors and Support Vector Machine methods. From the validation process, we found that optimal parameter for feature extraction using LDP are LDP on 2nd-order with radius value is 5 and overlapping non-uniform. Beside that, the most appropriate classification method for this problem is Support Vector Machine with Radial Basis Function kernel. This research use NUAA Imposter and Photograph Database as a dataset. The testing process implements optimal parameter in LDP and best classifier method in both of dataset produce 99.8% for the result of F1-Score that depicting its performance and 0.16% for the result of H-TER that indicating reliability of this spoofing attack detection system on face image. For execution time, uniform pattern of Local Derivative Pattern can make system faster than non-uniform pattern. Execution time for uniform pattern is 2.09s but for non-uniform pattern is 5.49s.

Keywords: Face, Spoofing-Attack, Local Derivative Pattern, k-Nearest Neighbors, Support Vector Machine