Implementation of a Low-Cost Driver Drowsiness Evaluation System Using a Thermal Camera

Authors : Isa Moazen, Ali Nahvi

Abstract : Driver drowsiness is a major cause of vehicle accidents, and facial images are highly valuable to detect drowsiness. In this paper, we perform our research via a thermal camera to record drivers' facial images on a driving simulator. A robust real-time algorithm extracts the features using horizontal and vertical integration projection, contours, contour orientations, and cropping tools. The features are included four target areas on the cheeks and forehead. Qt compiler and OpenCV are used with two cameras with different resolutions. A high-resolution thermal camera is used for fifteen subjects, and a low-resolution one is used for a person. The results are investigated by four temperature plots and evaluated by observer rating of drowsiness.