# A robust neonatal facial pain cues classification

## Abstract

Late of infant pain detection on the early stage may affect newborns growth. Regarding of this matter, different techniques have been proposed such as facial expressions, speech production variation, and physiological signals to detect the pain states of a person. For past 2 decades, the determination of pain state through images has been undergone substantial research and development. Various techniques are used in the literature to classify pain states on the basis of images. In this paper, a feature extraction method using Principal Component Analysis (PCA) was adopted for identifying the pain states of an infant. In this study images samples are taken from Classification of Pain Expressions (COPE) database. Fuzzy k-NN, k Nearest Neighbor (k-NN), Feed Forward Neural network (FFNN) and Linear Discriminant analysis (LDA) based classifier is used to test usefulness of suggested features. Experimental result shows that the suggested methods can be used to identify the pain states of an infant.