An Emotion Classification Model for Driver Emotion Recognition Using Electroencephalography (EEG)

T. A. Gamage*
Department of Computer Science
General Sir John Kotelawala Defence
University, Sri Lanka
36-se-0009@kdu.ac.lk

L. P. Kalansooriya
Department of Computer Science
General Sir John Kotelawala Defence
University, Sri Lanka
pradeepkalansooriya@kdu.ac.lk

E. R. C. Sandamali
Dept. of Computational Mathematics
General Sir John Kotelawala Defence
University, Sri Lanka
sandamali.erc@kdu.ac.lk

Abstract - **Road accidents have been a critical issue that has resulted in fatal injuries, disabilities, and deaths for many individuals worldwide. The notion of Human-Computer Interaction (HCI) is widely considered in monitoring drivers tosafeguard their lives on roads. As a solution to the issue of the higher rate of road accidents, driver emotion recognition approaches have gained much attention, and the involvement ofbiological signals in detecting the emotional states of drivers is also significant. The authors have conducted a comprehensive literature review that concerns contemporary literature on the driver emotion recognition paradigm and comes up with four emotional states in this research to monitor the drivers' affectivestates. This paper presents a novel approach to detecting sad, angry, fearful, and calm emotional states of drivers with an emotion classification model using Electroencephalography (EEG) signals where the EEG data acquisition for the research is done using the Emotiv EPOC X device. The collected EEG data are preprocessed using the EEGLAB toolbox in Matlab, and feature extraction, selection, and emotion classification model training are done using Matlab. EEG acquisition and preprocessing have already been achieved, and as further work,the authors are to train the proposed emotion classification model as laid out in this paper. The findings of this research encourage the authors to continue towards the completion and provide further insights into enhancing research in the driver emotion recognition paradigm.**

Keywords - driver emotion recognition, EEG, EEGLAB, emotion classification, road safety