COLLEGE OF COMMUNICATION AND INFORMATION TECHNOLOGY

# DRIVER DROWSINESS DETECTION SYSTEM

A Thesis Project
Presented to the Faculty of the
College of Communication and Information Technology
President Ramon Magsaysay State University
Iba, Zambales

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Computer Engineering

RECEIVED
FEB 24 2021

OFFICE OF THE UNIVERSITY REGISTRAR
RECEIVED
DATE: FEB 24 2021
BY:
RMTU IBA, ZAMBALES

By

CHRISTIAN PAUL R. AJOSTE
JEFFREY C. FONTILLAS
LERIO G. TOLENTINO
JOHN ROMMEL A. SEVILLA

MAY 2020

PRMSU-CCIT
RECEIVED
DATE: 19 FEB 2021
BY:

COLLEGE OF COMMUNICATION AND INFORMATION TECHNOLOGY

## CERTIFICATION

This thesis entitled **"Driver Drowsiness Detection System"**, prepared and submitted by **John Rommel A. Sevilla, Lerio G. Tolentino, Jeffrey C. Fontillas** and **Christian Paul R. Ajoste** in partial fulfillment of the requirements for the degree of **Bachelor of Science in Computer Engineering,** has been examined and recommended for Oral Examination.

**ENGR. RICKY S. BARRERA**

Adviser

## APPROVAL

Approved by the Panel of Examiners on Oral Examination on _____.

**ENGR. GLENDON F. MICLAT**

Chairman

**ENGR. BRYAN CARLOS B. ACAIN**

Member

**ENGR. REGINA F. AMISTAD**

Member

**ENGR. DIONISIO M. MARTIN, JR.**

Program Chair, BSCpE

Accepted in partial fulfillment of requirements for the degree of **Bachelor of Science in Computer Engineering.**

**MENCHIE A. DELA CRUZ, Ph.D.**

Dean

## ABSTRACT

Researchers estimate that more than 70 million Americans have a sleep disorder (Institute of Medicine, 2005). An estimated 1 in 25 adult drivers (aged 18 or older) report having fallen asleep while driving. The National Highway Traffic Safety Administration estimates that drowsy driving was responsible for 72,000 crashes, 44,000 injuries, and 800 deaths in 2013. There have been quite a few studies undertaken on how to put drowsiness detection into practice. In simple terms, the system needs to first determine whether a video (or series of pictures) contains a face. Sleepiness leads to crashes because it impairs elements of human performance that are critical to safe driving which includes slower reaction time, reduced vigilance, and deficits in information processing (Dinges & Kribbs, 1991). This study applies the Developmental Method which includes engineering designs, electronic circuits, programming, testing, and recalibrations. It involves the integration of the different system components based on the final design. Sensors were interfaced with the microcontroller, actuators were connected to the microcontroller to determine whether the input data results in the desired output. The researchers come up with a working engineering design and an optimized microcontroller program. Several tests were conducted and the input devices were recalibrated to achieve the desired results. There were inaccuracies noted including false detection of eye movements, false detection due to poor lighting, multiple face detection, and inaccurate reading of the camera. The Research Evaluation was conducted in the perspective of the developers. The researchers

and the pre-identified individuals with knowledge and expertise in the fields related to the subject matter conducted the tests to determine the level of product quality against the standard criteria of ISO/IEC 25010:2011. Technical experts were tapped to evaluate the product quality of the device against the ISO/IEC 25010:2011 standard. Functional Suitability, Performance Efficiency, Compatibility, Usability, Security, Maintainability and Portability were rated as Very Good (VG) while Reliability as Good (G). This result could be attributed to the maturity of the project design that a further study and actual implementation of the project is deemed necessary in order to improve its engineering design, optimize program algorithms, and increase the level of reliability.