



COLLEGE OF COMMUNICATION AND INFORMATION TECHNOLOGY

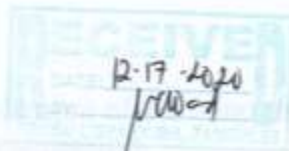
CERTIFICATION

This is to certify that the student named **Oliver John G. Basul** has successfully completed the requirements for the degree of Bachelor of Science in Computer Engineering in the subject of **SMART CHESS BOARD WITH CLOCK AND MOVE RECORDER**.

**SMART CHESS BOARD
WITH CLOCK AND MOVE RECORDER**

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

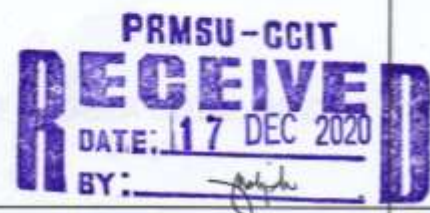
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Computer Engineering



By:

Oliver John G. Basul
Nikko A. Credo
Angel John G. Delfin
Jherick R. Magpayo

May 2020






COLLEGE OF COMMUNICATION AND INFORMATION TECHNOLOGY

CERTIFICATION

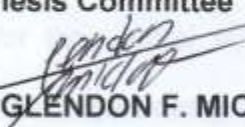
This thesis entitled "**SMART CHESS BOARD WITH CLOCK AND MOVE RECORDER**", prepared and submitted by **Oliver John G. Basul, Nikko A. Credo, Angel John G. Delfin and Jherick R. Magpayo** in partial fulfilment of the requirements for the degree **Bachelor of Science in Computer Engineering**, has been examined and recommended for Oral Examination.


ENGR. MARK A. GONZALES
Adviser


APPROVAL

Approved by the Panel of Examiners on Oral Examination on March 10, 2020 with the grade of ____.

Thesis Committee

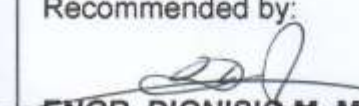

ENGR. GLENDON F. MICLAT
Chairman


ENGR. BRYAN CARLOS B. ACAIN
Member


ENGR. REGINA F. AMISTAD
Member

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

Recommended by:


ENGR. DIONISIO M. MARTIN JR.
Program Chair, BSCpE



MENCHIE A. DELA CRUZ, Ph.D. TE
Dean



TABLE OF CONTENTS

Smart Water Meter Reader is a project design that can scan the water meter and will automatically print the receipt of the water bill using the thermal printer. The device helps the operator to lessen their work. Practically, in everyday use, an operator will manually check the digit counter periodically. The Operator makes logs of the number shows by water meter to know the water consumption.

Therefore, the project introduces a system based on image processing to obtain efficiently and accurately reading of the electric digital meter. In this system the back camera of the device is used to acquire the image of the electricity meter. The system then applies a sequence of image processing functions to automatically extract and recognize the digits of the meter reading image. This image goes through three main stages: preprocessing which ends up with cropping the numeric reading area, segmentation of individual digits using horizontal and vertical scanning of the cropped numeric area, and recognition of the reading by comparing each segmented digit with the digit's templates. The proposed project will be used in the future to develop a device that could be used by the water service provider company to facilitate the reading process.