Department of Electrical and Computer Engineering

North South University

CSE498R - Directed Research

Semi-autonomous Wheelchair with Real-Time Object Detection Using YOLOv7

Submitted By

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Declaration

This is to declare that no part of this report or the project has been previously submitted elsewhere for the fulfillment of any other degree or program. Proper acknowledgement has been provided for any material that has been taken from previously published sources in the bibliography section of this report.

Faysal Miah

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Approval

The Senior Design Project entitled " Semi-autonomous Wheelchair with Real-Time Object Detection Using YOLOv7" by Faysal Miah(1721758042) is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Computer Science and Engineering on January 2, 2023 and has been accepted as satisfactory.

Supervisor's Signature

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Acknowledgement

First of all, we wish to express our gratitude to the Almighty for giving us the strength to perform our responsibilities and complete the report. I would like to express my heartfelt gratitude to my instructor **DR. Shahnewaz Siddique** and our department chairman **Dr. Rajesh Palit** for providing me with the wonderful opportunity to work on this project "Semi-autonomous Wheelchair with Real-Time Object Detection Using YOLOv7". It aided me in conducting extensive research and learning a great deal about this subject.

Finally, I would like to express my gratitude to my seniors and friends for their assistance in completing this project within the time constraints.

ABSTRACT

Disability is part of being human. According to the World Health Organization(WHO) an estimated 1.3 billion people – about 16% of the global population – currently experience significant disability.

In our senior design project we introduce a Semi-Autonomous wheelchair for the disabled people. Autonomous wheelchair is a technology that is appropriate for people who have lost mobility due to brain injury or the loss of limbs but or loss of eyesight. The technology can also enhance safety for users who use ordinary joystick- controlled powered wheelchairs, by preventing collisions with walls, fixed objects, furniture and other people. This project is intended towards contributing to the helping hand of the paralyzed patients. This is a multifunctional wheelchair that helps the is a multifunctional wheelchair that helps the unable person to control it in ways like automatic obstacle detection control and remote control. The main features of the wheel chairs are: Automotive format - (detects obstacles by YOLOv7 and finds new path to move). Remote controlled feature - (It's controlled by any android device through bluetooth connectivity). Security assurance - (It can assure security of the disabled person by keeping record of the data of the moving paths through camera.)