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REAL-TIME MOVEMENT CONTROL BASED ON EYE GESTURES FOR PEOPLE WITH NEUROLOGICAL DISORDER

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

People with total paralysis as experienced by tetraplegia patients must have total assistance during movement. The use of electrical wheelchair able to reduce the dependency of patient to caretaker. However, current technique of electrical wheelchair control that use joystick is not efficient due to disability of the patient. Some facial features such as eyes gestures have the potential as control inputs to the electrical wheelchair. Therefore, this project aims to develop a system that can classify different eyes gestures of human subject and convert it into different state of control instructions. Methods for object detection that had been developed by researchers in recent years are suitable to be used to detect faces and eyes. This work proposed the combination use of Haar Cascade classifier and Dlib facial detector for detecting face and eye region, respectively. Next, several image enhancement techniques and morphological operations are performed to detect the iris. Image moments is used to calculate the centre coordinate of the iris. Afterward, the iris coordinate is used to determine the classification of eye gestures. The proposed method has been proven to be efficient in detecting eyes gestures. The ratio of detection accuracy is ranged between 73.5% and 99.83% depending on the ambient lighting.

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