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**Defects detection of vehicle tyres by using YOLO
algorithm (TYRE-DDR)**

A Thesis Document by

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Abstract

Nowadays most of the people in the world use road transportation vehicles to transport from one location to another location. (Rajeswari et al., 2022). When driving a vehicle tyres are the only item that make contact between the ground and the vehicle. These tyres can be defective due to different types of reasons and then they can make a vehicle unstable and potentially cause a traffic accident (Behroozinia, Taheri and Mirzaeifar, 2019).

As such, this paper proposes a system which can classify and locate ten types of tyre defects with the identification of defective tyre risk level as a novel contribution to this research domain. In order to construct the proposed system, the You Only Look Once (YOLOv5) object detection algorithm is used to create the two models, one for classifying and locating each defect on tyres and other for detecting the risk level of the defective tyres. Self-created datasets were created with the three hundred ten images for training the models and annotations were done with the instructions and guidance of domain experts.

The final client interface of the proposed system (TYRE-DDR) is a mobile application, which can use functionalities of the system easily through the handheld device.

Keywords: Object detection, YOLO, Defects detection, Risk detection, Deep learning, Tyre defects, YOLOv5