UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG

LUNG LESION LOCALIZATION USING YOLOV8 BASED ON CT IMAGES FOR LUNG CANCER DETECTION

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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

Lung cancer is a primary cause of death worldwide, insisting on the importance of efficient diagnostic technologies for early identification. Traditional methods of diagnosis often struggle to accurately diagnose lung abnormalities, causing medical care delays. To solve this issue, this study relies on YOLOv8 deep learning architecture to develop a model for detecting lung abnormalities in annotated CT scan images. The project's objectives were to (a) develop a YOLOv8-based model, (b) train it to correctly differentiate between lesion and non-lesion regions, and (c) evaluate its performance using key metrics. The process included selecting a labelled dataset, implementing YOLOv8n and YOLOv8s versions, then training the models over multiple epochs to improve performance. At 60 epochs, YOLOv8s outperformed YOLOv8n, which had 97.2% accuracy and an F1-score of 0.888 at 90 epochs. The YOLOv8s model detected lesions more accurately and with fewer misclassifications, but the YOLOv8n model performed consistently and was generalizable. This data demonstrates that the project objectives were attained, with the YOLOv8 design demonstrating efficacy in tackling the issues of lung lesion detection.

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