Diagnosis of Bone Metastases and Prognosis of Fracture Risk Using Deep Learning and Imaging

J. H. Miao and K. H. Miao

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INTRODUCTION

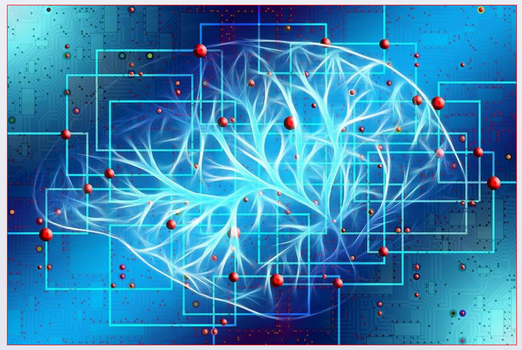
According to the World Health Organization, spinal diseases affect millions of people worldwide. With early detection and diagnosis, patients can be counseled, treated, and managed with more optimal surgical outcomes. Therefore, detecting, predicting, and diagnosing spinal disease early is critical for patient outcome optimization.

Currently, artificial intelligence and machine learning models are applied for diagnosis and prognosis of various diseases.

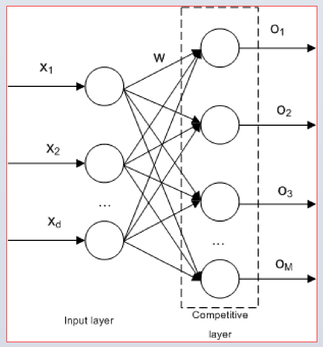
In this research project, a machine learning model is developed using artificial intelligence, imaging, and clinical patient data to aid the detection and prediction of spinal diseases and increase its diagnostic accuracy to optimize surgical outcomes.

METHODS

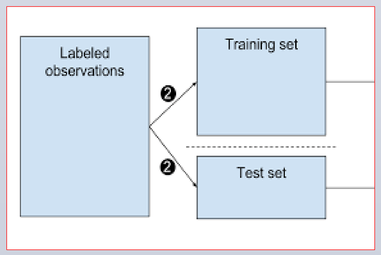
The machine learning model was built using deep network algorithms to predict and diagnose spinal disorders in patients.



Clinical data, including over 1,100 patients from hospitals, was used to develop, train, and test the machine learning model.

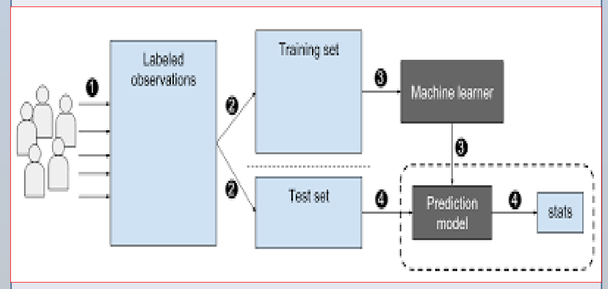


To train the model, 60% of the patient data was randomly selected while the remaining 40% of the data was utilized for testing spinal disease diagnosis capabilities of the model.



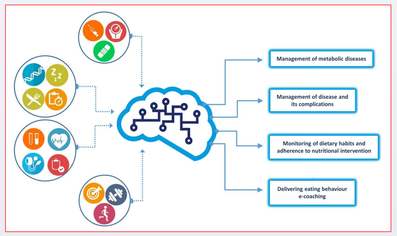
RESULTS

The created artificial intelligence model reached a diagnostic accuracy of 89.3% in diagnosing spinal diseases using the testing dataset and a diagnostic accuracy of 88.3% in diagnosing using the testing dataset, both exceeding current models.



Therefore, diagnosing spinal diseases early and accurately with the application of artificial intelligence in imaging can be a helpful tool for medical professionals in improving patient health outcomes, especially in resource limited areas of society.

CONCLUSIONS



Especially in locations with fewer medical specialists, the AI model is a cost-effective alternative option for early and accurate disease diagnosis. Thus, diagnosing spinal diseases with the aid of radiologic imaging and machine learning can improve surgical outcomes, and patient care.

References

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