

ARTIFICIAL INTELLIGENCE IN ENDODONTICS

INTRODUCTION : Artificial Intelligence(AI) bridges the gap between human and computer-enhancing diagnosis , treatment planning and patient outcomes.

ARTIFICIAL INTELLIGENCE

Techniques allowing computers to copy a human behavior

MACHINE LEARNING

AI techniques allowing computers to learn to solve a specific task

DEEP LEARNING

A subset of Machine Learning based on the use of neural networks



ADVANTAGES

- 1.Improved diagnostic accuracy
- 2.Enhanced patient care
- 3.Reduced healthcare costs



CHALLENGES

- (1)Data privacy and ethics
- (2)Need for large scale validation



APPLICATIONS OF AI IN ENDODONTICS

- 1.**CNN**: Identify **root canal morphology** ,detect **dental caries** , determine **working length** , detect **vertical root fracture** and **pathology** from radiographs.
- 2.**ANN**:**Pulp diagnosis**.
- 3.**Deep learning models** detect **C shaped canals**.

ARTIFICIAL INTELLIGENCE INNOVATION

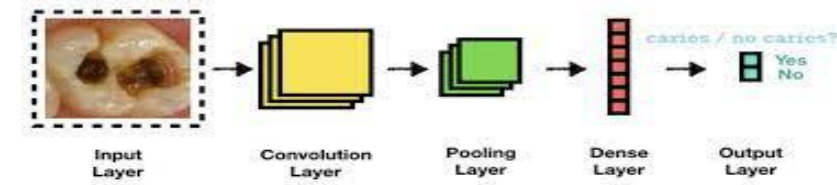


ROBOTICS IN RCT PRECISION

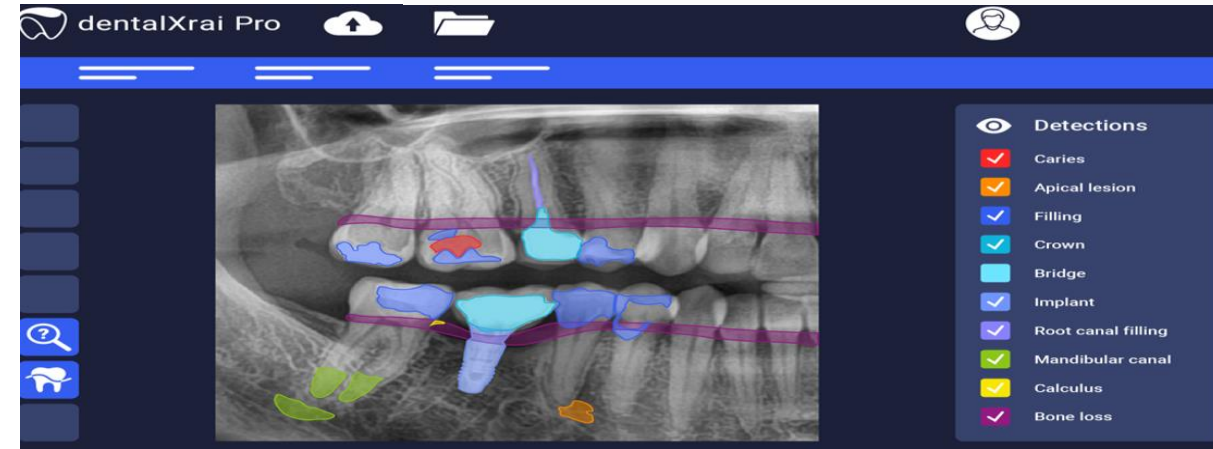
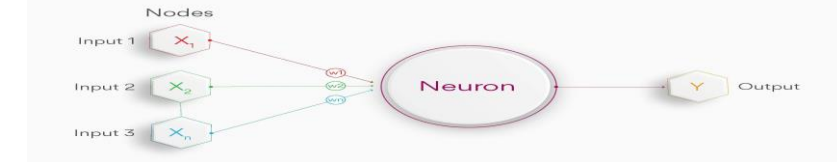
AI Leverage Models for Deep Learning

- 1.Convolutional neural networks(**CNN**)
- 2.Artificial neural networks(**ANN**)

CONVOLUTIONAL NEURAL NETWORK



Artificial Neural Network



AI MODEL IN ANALYZING DENTAL RADIOGRAPH

CONCLUSION

AI is revolutionizing endodontics by analysing radiographs , detecting periapical lesions in early stages , root fracture and root canal morphology thereby improving diagnosis and treatment outcomes.AI does reduce errors and healthcare costs , but it cannot replace human expertise . Instead it serves as a powerful tool to support clinicians for precise treatment.