

Artificial Intelligence Comparing Computer Vision Learning Models in Detecting Lung Cancer using CT imaging – A Metanalysis Review

Benson A Babu, Kaviya Sathyakumar, Michael Munoz

Saint John's Esiscopal Hospital, USA

Introduction: Computer Vision (AI) is a rapidly emerging tool in diagnostic medical imaging. We compare different deep learning and classic learning methods in lung cancer classification accuracy, sensitivity, and specificity. Furthermore, we evaluate the outcomes of deep learning methods to analysis by expert radiologists.

Study Design

- Meta-analysis
- 300 Cross-sectional studies extracted with standard search strategies
- 150 articles selected using Inclusion/Exclusion Criteria
- PROSPERO Registered
- PICO Framework
- Search Engines

PubMed/MEDLINE • EMBASE (or Scopus) • Cochrane Library • Google Scholar • Web of Science • IEEEExplore • DBLP

Primary analysis: Deep learning methods vs. Classical machine learning methods for lung nodule/tumor CT detection and diagnosis

Deep learning methods vs. analysis by radiologist

Subgroup Analysis: Comparing specific types of Deep learning classifiers (e.g., CNN, DBN, auto-encoders, etc.) and/

or specific types of Classical machine learning methods (e.g., SVM, LDA, etc.)

Outcomes

Sensitivity: how well the algorithm recognizes the type of nodule correctly

Specificity: measures the ability of the algorithm to remove the false positives, and a high specificity value means a low rate of misdiagnosis.

Accuracy: measures the proportion of data that correctly classified. Sensitivity-specificity ROC curve and Area under the curve (AUC): other indicators used to evaluate the performance of a classifier.

Data Analysis

Grade Approach rating the quality of individual studies

Heterogeneity testing using Cochran's Q and I²

Summary of Estimates and Forest Plot performed

Examination of Publication Bias

Conclusion: Deep learning methods are just as accurate, or more than compared to classic machine learning methods. Deep learning are just as accurate as compared with physician radiologist. Subgroup analysis comparing specific classic machine and deep learning methods.

Biography

Benson Babu Completed his education from the Cleveland Clinic Foundation, earned hospital quality process improvement physician executive master's in business administration. Areas of Active research include healthcare predictive analytics, machine learning, deep learning, computer-vision automation. He worked in NewYork-Presbyterian Hospital, USA and he is interested in Internal Medicine. He has published many papers in the journals.