

A COMPACT XCEPTION–GCN FRAMEWORK FOR ACCURATE LUNG CANCER SUBTYPE CLASSIFICATION FROM HISTOPATHOLOGY IMAGES

DIP ACHARYA^{1*} AND SUBRATA SINHA¹

Accurate classification of lung cancer subtypes from histopathological images is critical for clinical diagnosis, yet existing convolutional neural networks (CNNs) inadequately capture relational dependencies among samples.

To address this limitation, this work proposes a compact hybrid framework that integrates a pre-trained Xception network for deep feature extraction with a Graph Convolutional Network (GCN) for relational learning. Extracted features are standardized, reduced using Principal Component Analysis, and structured into a similarity-based graph for classification.

The proposed model is evaluated on a lung histopathology dataset comprising adenocarcinoma, squamous cell carcinoma, and non-malignant tissues, achieving classification accuracy and ROC-AUC values close to 99%.

The framework offers an efficient and accurate CNN–GCN solution suitable for practical digital pathology applications.
