

ABSTRAK

KLASIFIKASI CITRA DIGITAL KANKER PARU-PARU DENGAN METODE *CONVOLUTIONAL NEURAL NETWORK* DUA TAHAP

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Paru-paru merupakan organ vital yang berfungsi dalam pertukaran oksigen dan karbon dioksida. Kanker paru-paru menjadi salah satu penyakit dengan angka kematian tertinggi di dunia, terutama karena sebagian besar kasus terdiagnosis pada stadium lanjut. Proses identifikasi kanker secara manual melalui citra medis masih menghadapi tantangan, seperti keterbatasan waktu radiolog dan kesulitan membedakan *nodule* dari jaringan di luar parenkim. Perkembangan teknologi *deep learning* menawarkan solusi dengan kemampuan mengekstraksi fitur citra secara otomatis dan meningkatkan akurasi klasifikasi. Penelitian ini mengembangkan model klasifikasi kanker paru-paru menggunakan *metode Convolutional Neural Network* (CNN) dua tahap dengan memanfaatkan *dataset Lung and Colon Cancer Histopathological Images* dari Kaggle yang terdiri dari tiga kelas: *lung benign tissue*, *lung adenocarcinoma*, dan *lung squamous cell carcinoma*. Model dievaluasi untuk menilai kinerjanya dalam membedakan ketiga kategori tersebut. Hasil penelitian diharapkan menghasilkan model yang akurat dan mampu membantu proses diagnosis kanker paru secara lebih cepat dan efektif.

Kata Kunci: Kanker Paru-Paru, Citra Digital, *Deep Learning*, CNN, Klasifikasi.

ABSTRACT

DIGITAL IMAGE CLASSIFICATION OF LUNG CANCER USING A TWO-STAGE CONVOLUTIONAL NEURAL NETWORK METHOD

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The lungs are vital organs responsible for the exchange of oxygen and carbon dioxide in the human respiratory system. Lung cancer is one of the leading causes of cancer-related deaths worldwide, largely due to diagnoses that often occur at an advanced stage. Manual identification of cancer through medical imaging still presents challenges, including limited radiologist examination time and difficulties distinguishing nodules from surrounding non-parenchymal tissues. Advances in deep learning provide effective solutions by automatically extracting image features and improving classification accuracy. This study develops a two-stage Convolutional Neural Network (CNN) model for lung cancer classification using the Lung and Colon Cancer Histopathological Images dataset from Kaggle, consisting of three classes: lung benign tissue, lung adenocarcinoma, and lung squamous cell carcinoma. The model is evaluated to assess its performance in distinguishing the three categories. The results are expected to provide an accurate classification model that supports faster and more effective lung cancer diagnosis.

Keywords: Lung Cancer, Digital Imaging, Deep Learning, CNN, Classification.