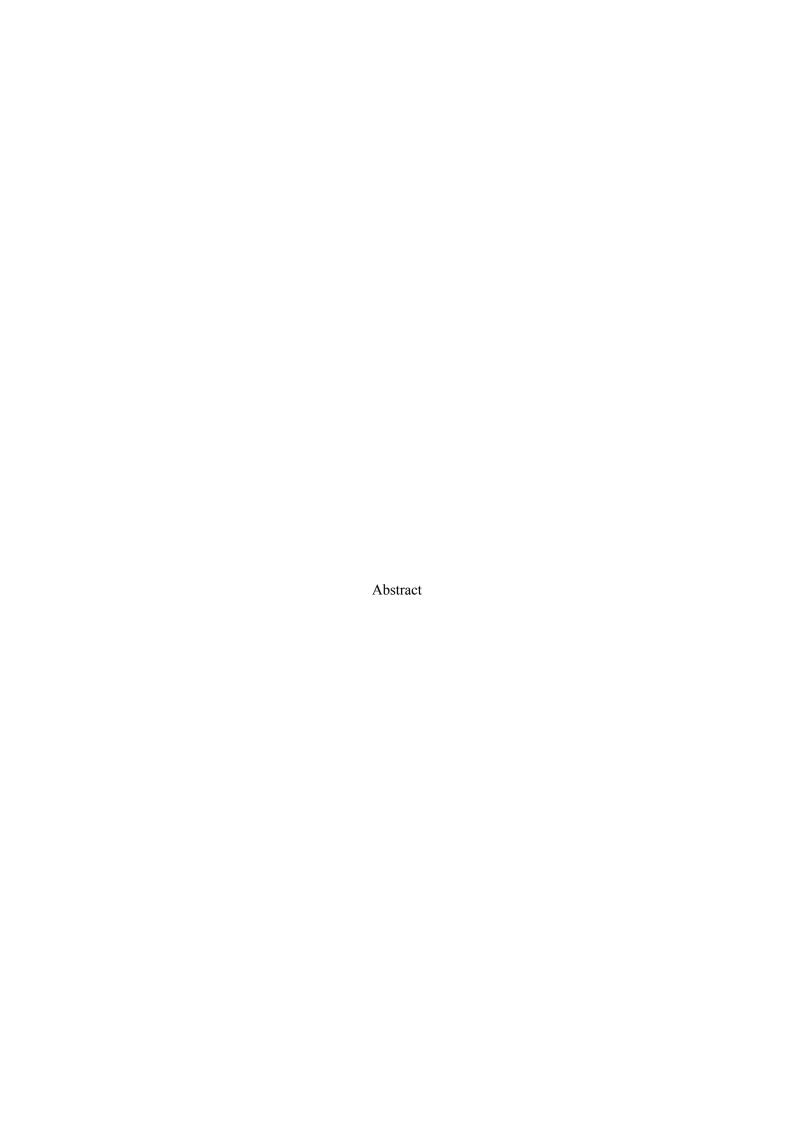# Leukemia Detection Using Deep Learning (Android)

Abstract

Leukemia, a malignant disorder affecting the blood and bone marrow, necessitates accurate and timely detection for effective treatment and improved patient outcomes. This study presents a comprehensive approach to leukemia detection, integrating deep learning techniques within a web-based platform developed using Django, complemented by an Android application interface. The dataset utilized comprises diverse medical imaging data, including blood smears and relevant information, facilitating robust model training and validation.

The methodology entails meticulous preprocessing of the dataset to standardize image resolutions, enhance data consistency, and prepare for deep learning model compatibility. Subsequent application of data augmentation techniques augments the dataset, improving model generalization and robustness. The deep learning model employed for leukemia detection is tailored for medical image analysis, leveraging advanced architectures such as Convolutional Neural Networks (CNNs) or Recurrent Neural Networks (RNNs).

The trained model seamlessly integrates into a web-based platform powered by Django, offering users a user-friendly interface to upload medical imaging data and receive real-time diagnostic predictions. Simultaneously, an Android application interface extends the system's accessibility, allowing users to interact with the leukemia detection system from their mobile devices. The Android app facilitates image uploads for prediction, leveraging network communication to send data to the server.

Key features of both the web-based platform and Android application include seamless image uploads, instantaneous prediction results, and visualization of diagnostic outcomes, enhancing usability for medical professionals and patients alike. Performance evaluation metrics, including accuracy, sensitivity, specificity, and area under the receiver operating characteristic curve (AUC-ROC), validate the model's efficacy in accurately detecting and classifying leukemia cases, distinguishing between different subtypes with high precision.

This research significantly advances medical imaging and healthcare technology by providing a practical solution for early detection and diagnosis of leukemia. By leveraging advanced deep learning techniques and user-friendly interfaces, this approach aims to enhance diagnostic accuracy and accessibility, ultimately leading to improved patient outcomes and prognosis for individuals affected by leukemia.

In conclusion, the integration of deep learning models within web-based platforms and mobile applications represents a significant advancement in utilizing technology for medical diagnosis and treatment. This system holds promise for facilitating early detection and intervention for leukemia, contributing to efforts to combat this complex disease and improve patient care in hematology practice.