Blood Group Detection using Finger Print

Hema G Shankar[1], Hamsa M C[2], Likitha T R[3], Manasa Y P[4], Dr.Yathish Aradhya B C[5]

Students, Department of CSE[1-4]

Associate Professor, Department of CSE[5]

Kalpataru Institute of Technology, Tiptur, India

Abstract: *This work presents a contactless approach for identifying human blood groups using fingerprint images. Unlike conventional blood typing techniques that require invasive blood sampling, the proposed method employs deep learning to classify blood groups based on fingerprint ridge characteristics. A modified ResNet-18 convolutional neural network is utilized to categorize fingerprints into eight blood group classes: A+, A−, B+, B−, AB+, AB−, O+, and O−. Image preprocessing techniques are applied to enhance ridge clarity, and data augmentation is used to improve robustness and generalization. The model is trained and evaluated on a labelled grayscale fingerprint dataset with controlled data separation to ensure reliable results. Performance is assessed using accuracy, precision, recall, F1-score, and confusion matrix analysis. A user-friendly frontend enables secure login, image upload, and real-time blood group prediction. The proposed solution offers a fast, safe, and non-invasive alternative suitable for healthcare, emergency response, and remote diagnostic applications.*

Keywords: Non-invasive blood group detection, Fingerprint images, deep learning, ResNet-18, convolutional neural network, data augmentation