Advanced Blast Identification in All Using Pivot-Growing Segmentation and U-Net PLR

Renas Rajab Asaad
Information Technology Department, Technical College of Informatics-Akre/ Akre University for Applied Sciences

Saman M. Almufti
Information Technology Department, Technical College of Informatics-Akre/ Akre University for Applied Sciences

Ridwan Boya Marqas
Department of Computer Science, College of Science, Knowledge University, Erbil 44001, Iraq
Software engineering, Firat University, Elazig, Turkey

Chalang Suleiman Hussein
Accounting Techniques Department, College of Administrative Techniques, Duhok Polytechnic University, Duhok, Iraq

Dilovan Asaad Majeed
Information Technology Department, Technical College of Informatics-Akre/ Akre University for Applied Sciences

Abstract:

In this work, we propose a singular approach for blast identification and classification in Acute Lymphoblastic Leukemia (ALL), an ordinary kind of formative child cancer dataset. The proposed method combines the Pivot-Growing Segmentation (PGS) algorithm with the U-Net structure better with Parametric Leaky ReLU (PLR) activations. The Pivot-Growing Segmentation has set of rules to clustering method that utilizes K-medoid and squared Euclidean distance as a similarity degree. In this context, it's far used to delineate blast areas from microscopic images by imparting unique localization. This technique is hired to improve the accuracy of blast identification, that's vital for accurate diagnosis and treatment of cancer. The U-Net PLR version is then used for blast classification that is a fully linked Convolutional Neural Network (CNN) with Parametric Leaky ReLU activations. This version is designed to extract difficult capabilities from segmented areas, improving the type overall performance. The U-Net PLR version includes an encoder and decoder structure, with bypass connections among the corresponding layers. The encoder is accountable for extracting capabilities from the input image, while the decoder reconstructs the image and outputs the segmentation mask. The proposed method is achieving overall performance in blast identification and classification of the given dataset. The proposed technique offers a promising path for boosting diagnostic accuracy and assisting in personalized treatment techniques for pediatric sufferers with ALL.

Keywords:

Pivot-Growing Segmentation, K-medoid, Squared Euclidean Distance, U-Net PLR, Parametric Leaky ReLU.