

ABSTRACT

The liver which is a major human physical organ, is present underneath the diaphragm and extends from right to left upper part of the belly. The liver is an organ that has many responsibilities for producing different chemicals needed for the physical body. The conversion of an image into information is helpful for researchers to share and derive accuracy. The method of conversion prevents manual error because it depends on technology and algorithm. Since liver cancer signs appear in late stages, it cannot be identified early such that they are challenging to detect, which causes a high mortality rate among all other cancers. The most significant cause of death among humans is liver cancer. Therefore, the detection of liver cancer is required in the early diagnosis and offers the most possibility to treat cancer patients safely and effectively. However, it's the most complicated approach to boost the likelihood for the individual to live. Segmentation and classification of liver tumors from computed tomography images were essential to the advancement of early diagnosis and treatment of liver cancer.

Nevertheless, the varying morphologies, boundaries, different densities, and sizes of the lesions make this job complicated. Therefore the first stage of this research deals with the detection of liver cancer by implementing optimization techniques. The first-stage discussion is about scanning, filtering, segmentation, feature extraction, and exhibit through an Artificial Neural Network (ANN). In real-time data sets, Feed-Forward Neural Network (FFNN) is applied for classification and detection of liver cancer. Filtering is mainly used to reduce noise and smooth edges. Then, Segmentation is used to extract the needed region so that results can be stored in less storage space. Feature extraction is done through Gray Level and Co-occurrence Matrix (GLCM) that can yield the result in various parameters. This matrix helps in differentiating the tumors as Benign and Malignant. Artificial neural network is trained to differentiate those tumors. The effect is analyzed by following the parameters

like accuracy, area, correlation, entropy, homogeneity, contrast, and similarity index. Then, in the second stage of the research work, Segmentation and classification of liver tumors from computed tomography images were done to the advancement of early diagnosis and treatment of liver cancer.

Nevertheless, the varying morphologies, boundaries, different densities, and sizes of the lesions make this job complicated. In order to cope these complications and challenges, a new method for distinguishing and classifying tumors from computed tomography images using a network-based improved residual Google Net convolutionary Neural Networks is proposed. The findings are correlated with scientific and clinical results derived from the field specialists.