LCNN: Deep Convolutional Network (CNN) for Early Detection of Stage of Liver Disease

Shekhar, Aarna (School: Shri Ram School - DLF Campus)

With just 5% survival rates, Liver cancer is one of the deadliest cancers in the world. Due to its low survival rates, early diagnosis of liver disease is extremely crucial. The aim of the project was to create a more accurate tool for screening and classification of stages of liver disease using CT scan images. CT (Computed Tomography) scans minimize exposure to radiation and offer different views of the liver. The stages of liver disease to be classified are Healthy Liver, Fatty Liver, Liver Cirrhosis and the end stage of liver disease-Liver Cancer. For this purpose, artificial intelligence was leveraged using a Convolutional Neural Network based on computer vision models. A de-identified dataset of CT scan images was obtained from a hospital. Current methods only use binary classification of liver cancer using CNN's. This model can enable accurate multi-class classification of each stage associated with liver disease in spite of limited dataset. The model was trained on state-of the art CNN models using transfer learning such as VGG-16, VGG-19, Inception and Resnet-50. The model was trained with several hyper-parameters to improve the performance of the classification model. This tool has the future potential to be used in clinical settings to detect the stage of liver disease.

Awards Won: