LIVER CANCER SEGMENTATION AND CLASSIFICATION

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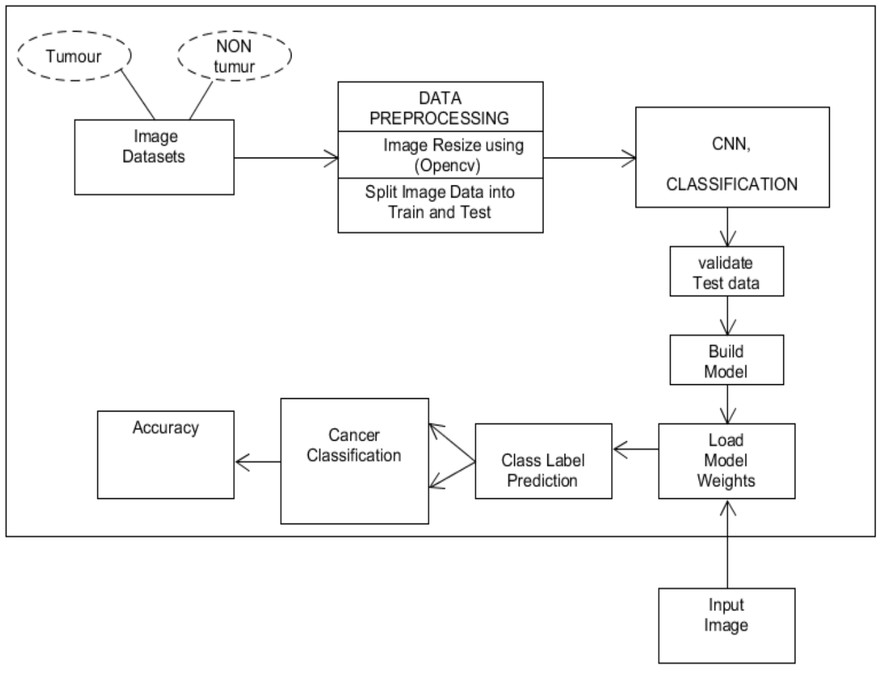
INTRODUCTION

The need of an immediate and precise diagnosis can't be emphasised in the healthcare field where liver cancer cases are rising. Identification of liver abnormalities has benefited by the utilisation of diagnostic imaging procedures like computed tomography (CT) scans. However, this process often demands substantial human effort and expertise. Our project's goal is to utilise the potential of deep learning, more especially CNN, to handle this difficulty, in automating the intricate tasks of segmenting and classifying liver tumors within CT scan images. The potential ramifications of this endeavor extend to enhanced patient outcomes, optimized treatment strategies, and the overall efficiency of healthcare workflows.

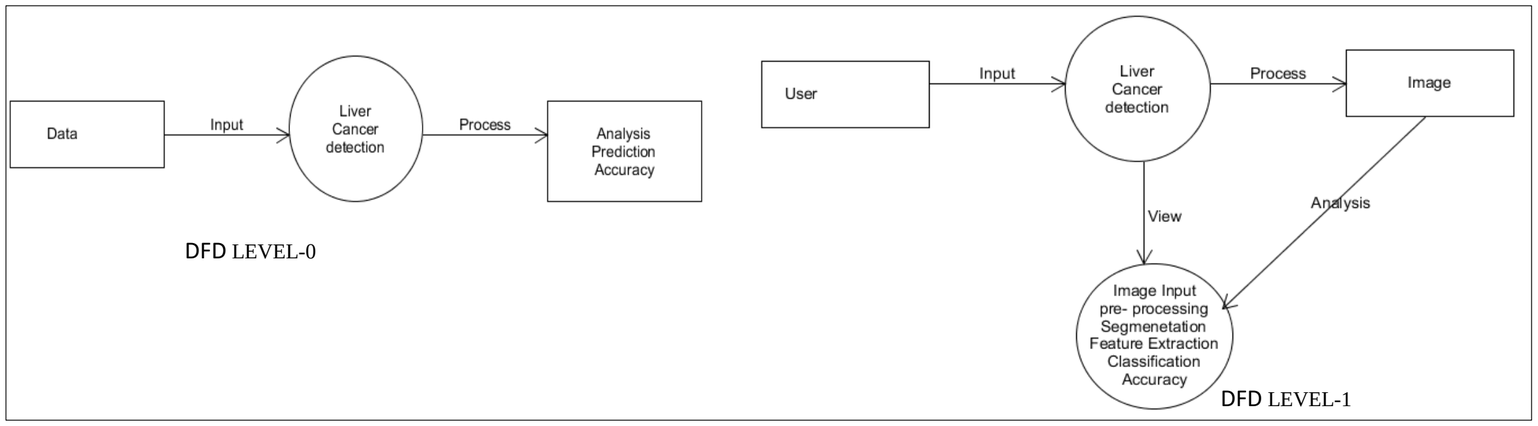
PROBLEM STATEMENT

Our project addresses the critical challenge of automating the laborious and time-intensive task of liver tumor segmentation and classification in CT scans. We aim to provide healthcare professionals with a precise and efficient solution to identify and categorize tumors based on type and stage, overcoming complexities such as variations in size, shape, texture, and location. Our work seeks to revolutionize the way liver tumors are detected and characterized, ultimately improving patient care and diagnosis.

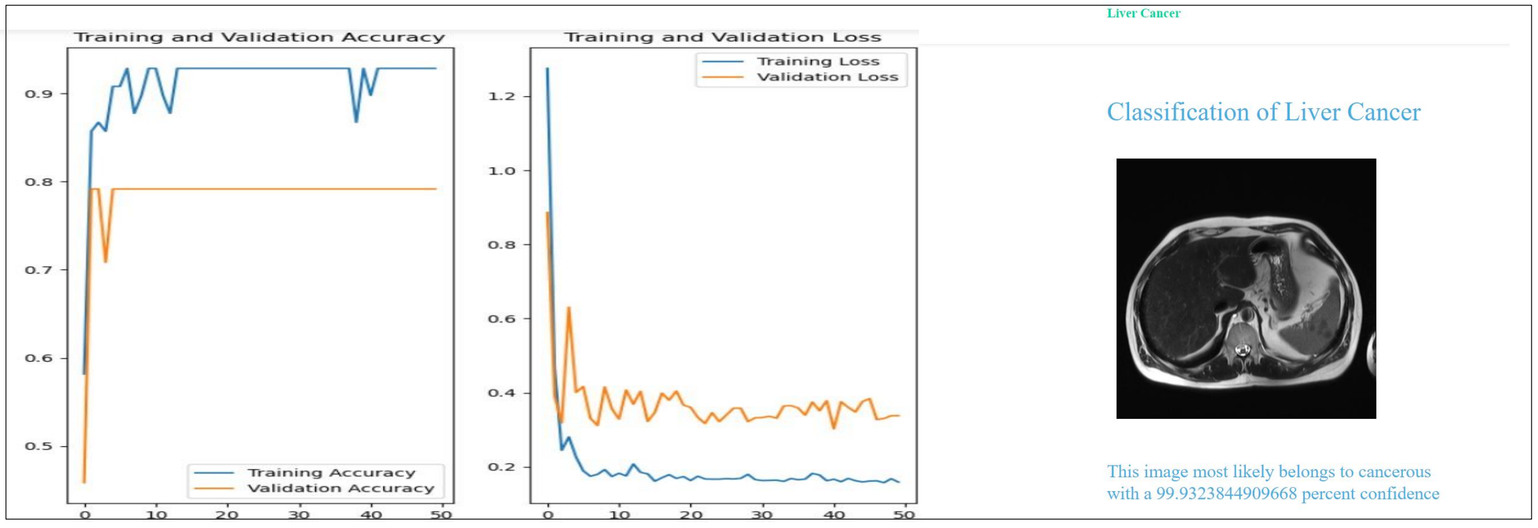
ARCHITECTURE



DATA FLOW DIAGRAMS



RESULTS & SCREENSHOTS



FUTURE ENHANCEMENT

In our future enhancements, we plan to incorporate advanced deep learning techniques like attention mechanisms and GANs to boost liver cancer classification accuracy. Additionally, we aim to handle multi-modal data integration and address imbalanced datasets using oversampling and SMOTE. To ensure clinical usability, we'll provide explainability tools and enhance integration with existing clinical systems via standardized interfaces.

CONCLUSION

"Our experiment successfully utilized CNN and deep learning to extract and classify features from liver tumors, leveraging CT scan datasets for training and testing. We assessed the technique's effectiveness through comprehensive performance metric analysis, revealing the potential for enhanced medical image identification using 2D feature maps and multiple slices. By segmenting tumors through voxel classification and applying Convolutional Neural Networks, we achieved promising results in tumor detection within liver masks. This study underscores the potential of deep learning in advancing liver disease detection, paving the way for future improvements in healthcare."

ACKNOWLEDGEMENT

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