COMPUTER VISION MODEL FOR LUNG CANCER DETECTION USING BIOPSY IMAGES

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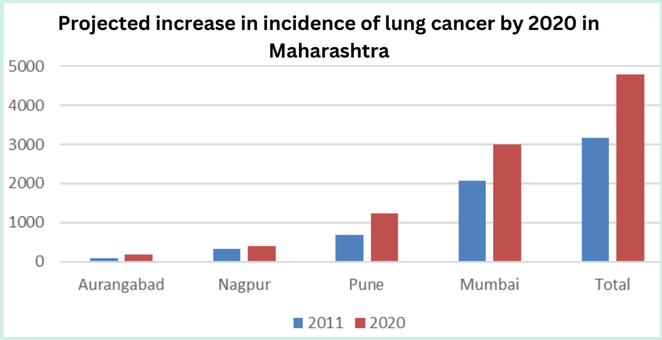
INTRODUCTION

- Lung cancer is a growing concern in India, affecting both smokers and non-smokers.
- Unique risk factors like indoor air pollution, biomass fuel exposure, and micronutrient availability are contributing to the rise in lung cancer.
- Aizawl district in Mizoram has the highest lung cancer incidence and mortality rates.



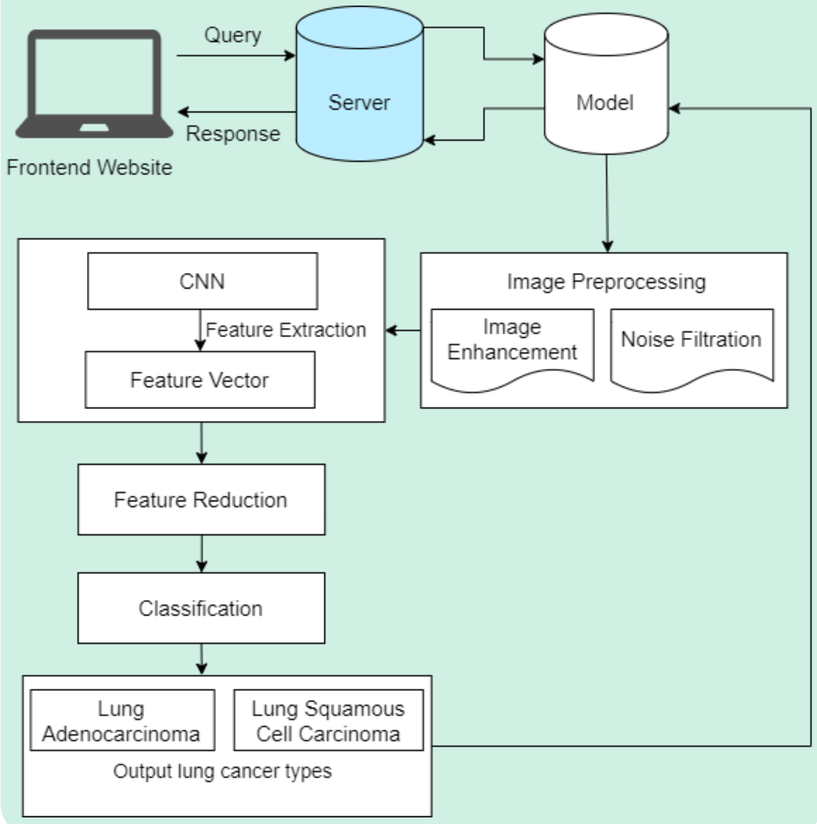
OBJECTIVES

1. Empower healthcare professionals with timely diagnostic predictions, improving patient outcomes and tailored treatment strategies.
2. Flexible framework for future enhancements, including improved accuracy, subtype classification, and support for ongoing lung cancer detection research.

METHODOLOGY

- Preprocessed lung cancer biopsy images.
- Utilized **EfficientNetB1** with **L=240** for classification.
- Employed **Global Average Pooling: R = 256**, where R is image resolution.
- Added two dense layers.
- Training with **"adam"** optimizer and **"sparse_categorical_crossentropy"** loss.
- Applied Early Stopping and learning rate reduction.

SYSTEM ARCHITECTURE



TECHNOLOGIES USED

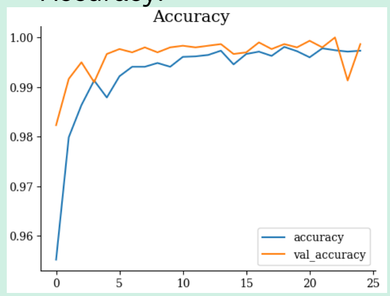
TensorFlow · Keras · scikit learn · django

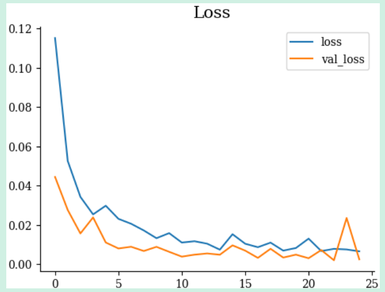
CONCLUSION

- High lung cancer rates in India lead to significant morbidity and mortality.
- GLOBOCAN 2012 data reveals a substantial incidence of lung cancer, especially in males.
- Technology, like computer vision and algorithms, can transform diagnosis by differentiating benign and malignant nodules.
- Early diagnosis through technology is vital for enhancing curative treatment results.

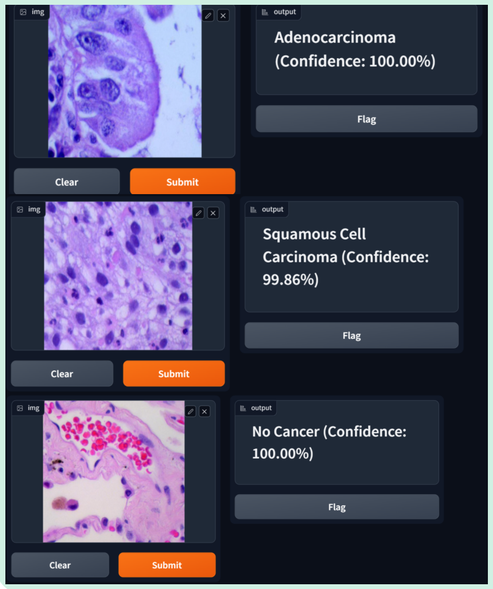
IMPLEMENTATION

- Accuracy:





- Model Predictions:



- **Actual: Adenocarcinoma**
- **Predicted: Adenocarcinoma**
- **Actual: Squamous cell carcinoma**
- **Predicted: Squamous cell carcinoma**
- **Actual: Normal lung**
- **Predicted: No cancer**

REFERENCES

- M. Chen, S. Huang, Z. Huang and Z. Zhang, "Detection of Lung Cancer from Pathological Images Using CNN Model," 2021 IEEE International Conference on Computer Science, Electronic Information Engineering and Intelligent Control Technology (CEI), Fuzhou, China, 2021, pp. 352-358, doi: 10.1109/CEI52496.2021.9574590.
- A. S. Sakr, "Automatic Detection of Various Types of Lung Cancer Based on Histopathological Images Using a Lightweight End-to-End CNN Approach," 2022 20th International Conference on Language Engineering (ESOLEC), Cairo, Egypt, 2022, pp. 141-146, doi: 10.1109/ESOLEC54569.2022.10009108.