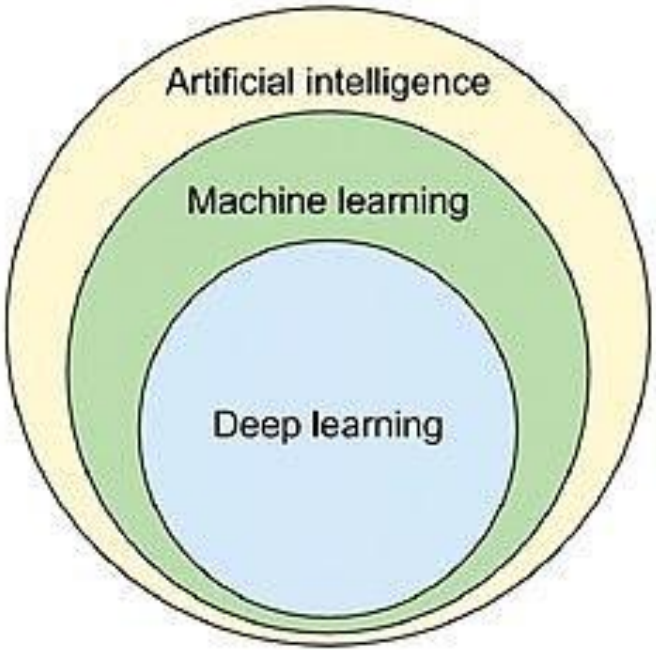
Detecting Lung Cancer with AI and CT Scans

Sai Siddhish Chandra Sekaran
Intern/Mentor PD1

Some Definitions...



- Lung Cancer: Rapid, uncontrolled growth of cells in the lungs (World Health Organization 2023)

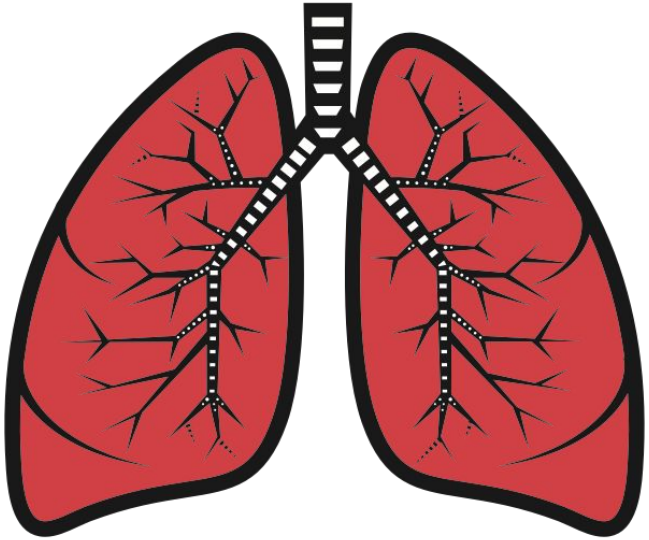
- AI: A computer being intelligent & adaptive
- ML: AI + Data = Informed model that can make better decisions

- CNN: A ML model that is particularly good at image, audio, and video processing (GeeksforGeeks, 2024)
- Ensemble Modeling: ML technique where you take the outputs of multiple models (GeeksforGeeks, 2023)

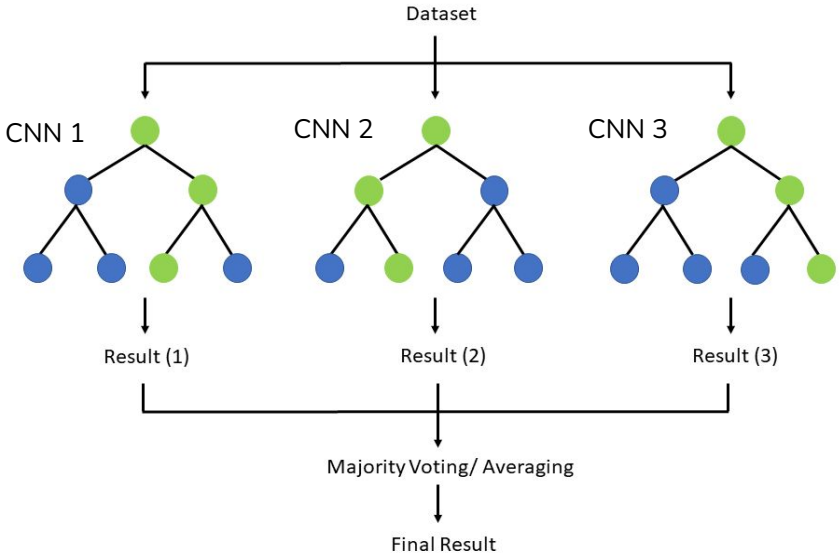
Background

- I have a passion for Computer Science & AI
- I want to create an impact with AI
- Many developed AI models don’t get used full-time

- Millions of people are affected by it annually
- It is very hard to detect lung cancer in its earlier stages



Research Question



Can the use of Convolutional Neural Networks with varying activation functions in Ensemble modeling improve the accuracy of multi-class classification of lung cancer subtypes from CT scan images compared to individual models?

Hypothesis

Basis:

- Grouping leads to higher reliability
- Relying on multiple diagnoses instead of one
- Varying actiivations causing different learning

Rationale (Why?)

- Save the lives of millions
  - Close to 2 million people die every year because of lung cancer (World Health Organization 2023)
- Aid doctors in their diagnoses (detect LC earlier)
  - Survival rate of LC patients drops when the cancer is in its later stages (A. R. & Kumar R. S., 2022, p. 1)
- Do something uncommon (ensemble modeling) to see its benefits in this area

Works Cited

Thank you for listening!

Works Cited:

GeeksforGeeks. (2024, September 9). Introduction to Convolution Neural Network. GeeksforGeeks. Retrieved October 7, 2024, from www.geeksforgeeks.org/introduction-convolution-neural-network/

GeeksforGeeks. (2023, December 26). A Comprehensive Guide to Ensemble Learning. GeeksforGeeks. Retrieved October 7, 2024, from www.geeksforgeeks.org/a-comprehensive-guide-to-ensemble-learning/

A. R., B., & Kumar R. S., V. (2022). Deep learning-based lung cancer classification of CT images using augmented convolutional neural networks. ELCVIA Electronic Letters on Computer Vision and Image Analysis, 21(1). https://doi.org/10.5565/rev/elcvia.1490

World Health Organization. (2023, June 26). Lung cancer [Fact sheet]. World Health Organization. Retrieved October 7, 2024, from https://www.who.int/news-room/fact-sheets/detail/lung-cancer