



DR. HEALTH

Advance healthcare at your fingertips



TEAM SHADOWS

AIM OF THE PROBLEM IS TO DETECT THE PRESENCE AND ABSENCE OF DISEASES IN A PERSON BASED ON THEIR FEATURES

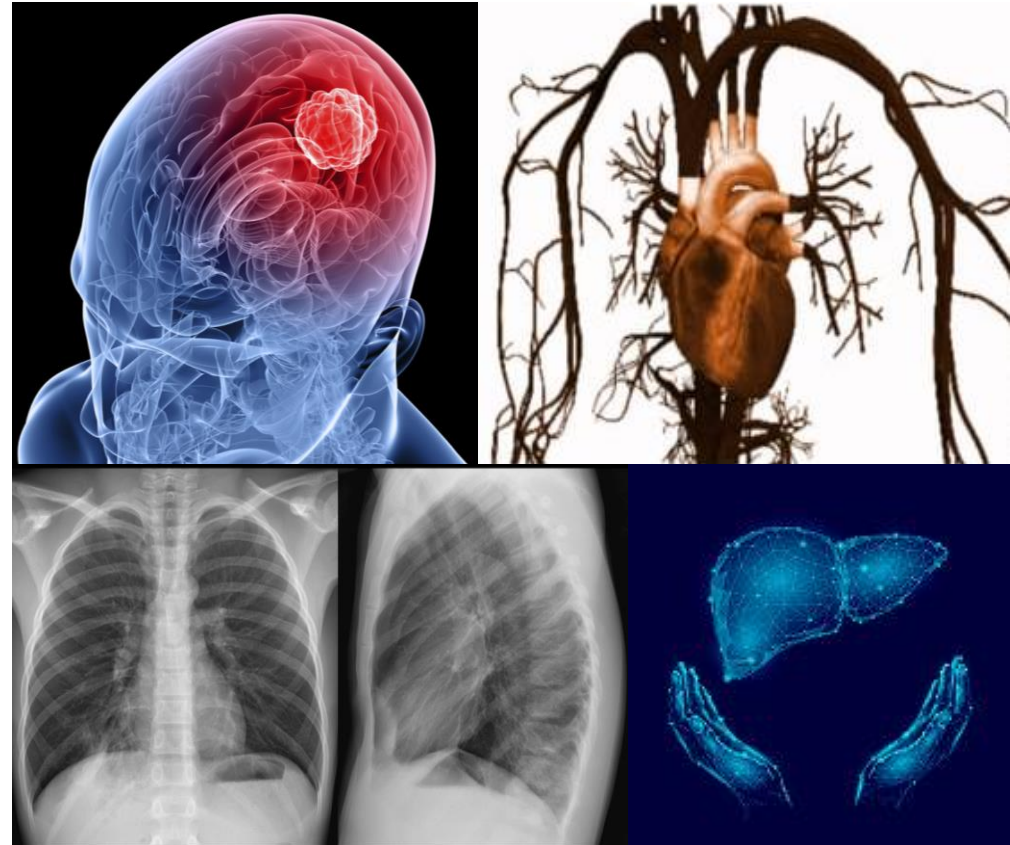
DISEASES TO IDENTIFIED ARE:

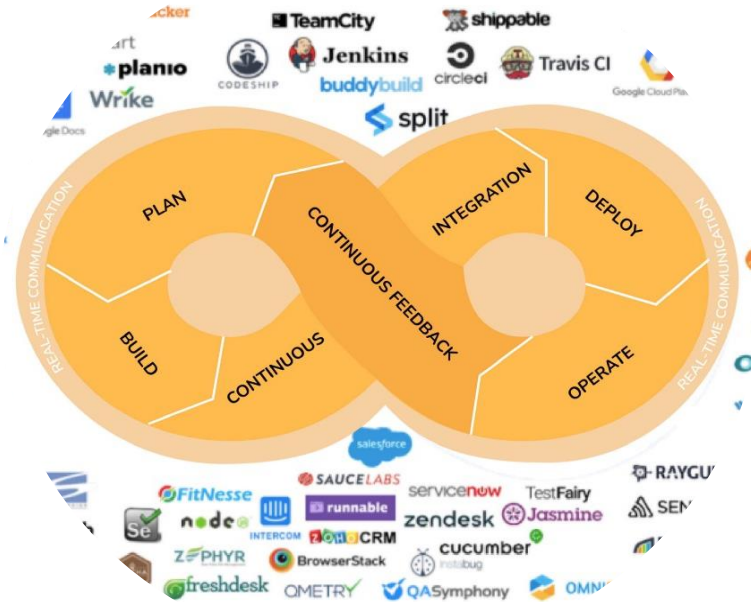
CARDIOVASCULAR DISEASES

BRAIN TUMOR

PNEUMONIA

LIVER CANCER





TECHNOLOGY STACK



PYTHON

FLASK

HTML

CSS

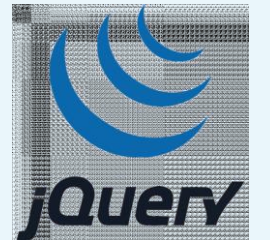
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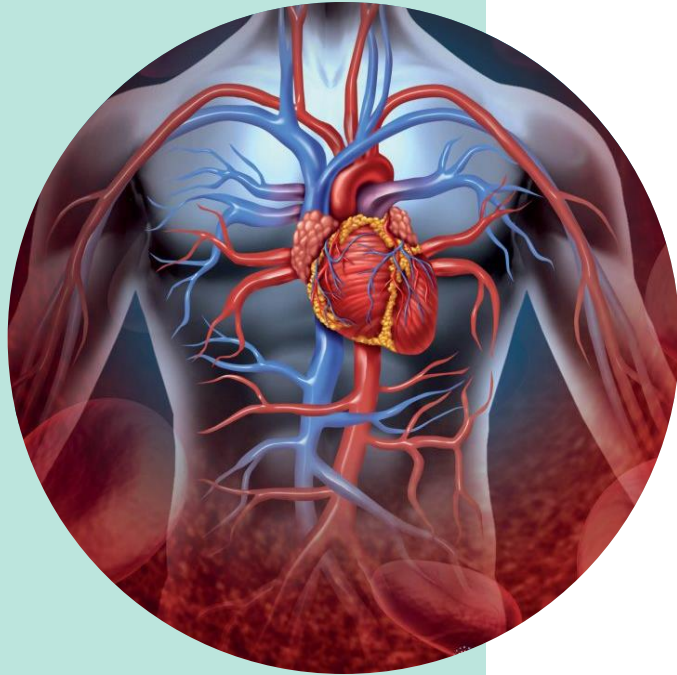


BOOTSTRAP

JQUERY

AJAX





CARDIOVASCULAR DISEASES

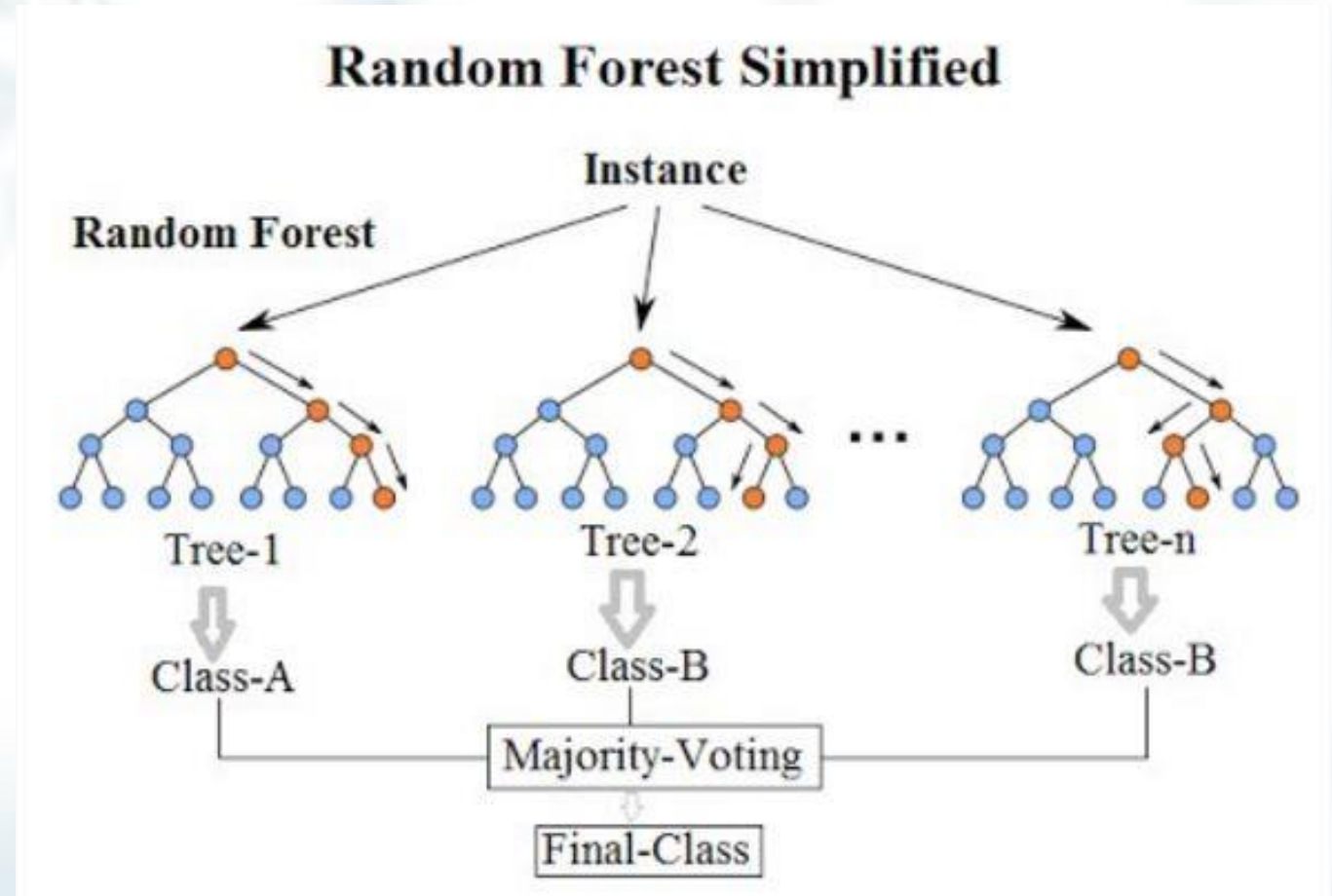
Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They include:

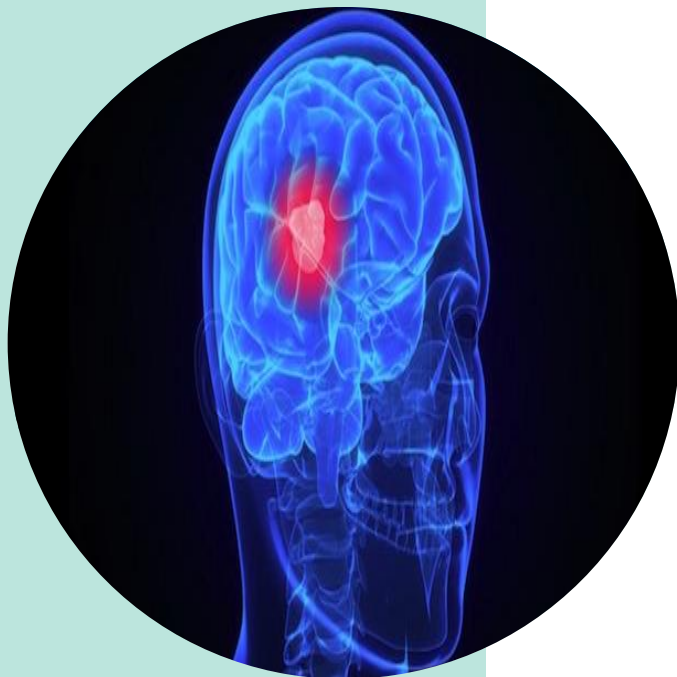
- ❖ coronary heart disease – a disease of the blood vessels supplying the heart muscle;
- ❖ cerebrovascular disease – a disease of the blood vessels supplying the brain;
- ❖ peripheral arterial disease – a disease of blood vessels supplying the arms and legs;
- ❖ rheumatic heart disease – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
- ❖ congenital heart disease – birth defects that affect the normal development and functioning of the heart caused by malformations of the heart structure from birth

A heart attack or stroke may be the first sign of underlying disease. Cardiovascular diseases (CVDs) are the leading cause of death globally. An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke. Over three quarters of CVD deaths take place in low- and middle-income countries. Out of the 17 million premature deaths (under the age of 70) due to noncommunicable diseases in 2019, 38% were caused by CVDs.

OUR MODEL

- ❖ THE SUPERVISED MACHINE LEARNING METHOD RANDOM FOREST IS APPLIED TO BOTH CLASSIFICATION AND REGRESSION PROBLEMS. IT IS AN ENSEMBLE LEARNING TECHNIQUE THAT BUILDS A NUMBER OF DECISION TREES AND COMBINES THEIR FORECASTS TO PROVIDE MORE PRECISE AND CONSISTENT FORECASTS.
- ❖ A RANDOM SELECTION OF CHARACTERISTICS FROM THE TRAINING DATA ARE USED TO BUILD THE DECISION TREES, WHICH HELPS TO LESSEN OVERFITTING AND INCREASE THE GENERALIZABILITY OF THE MODEL.
- ❖ WHEN PERFORMING CLASSIFICATION OR REGRESSION TASKS, THE ALGORITHM GENERATES A HUGE NUMBER OF DECISION TREES, COMBINING THEIR PREDICTIONS USING THE AVERAGE OR A MAJORITY VOTE.
- ❖ RANDOM FOREST IS A PREFERRED BECAUSE IT IS VERY SIMPLE TO DESIGN, CAN MANAGE MISSING VALUES, AND CAN HANDLE BIG DATASETS WITH HIGH DIMENSIONAL FEATURES.
- ❖ ACCURACY FOR THE ABOVE MODEL IS 88%.





BRAIN TUMOR

A brain tumor is a mass or growth of abnormal cells in your brain. Some brain tumors are noncancerous (benign), and some brain tumors are cancerous (malignant). Brain tumors can begin in your brain (primary brain tumors), or cancer can begin in other parts of your body and spread to your brain as secondary (metastatic) brain tumors. The signs and symptoms of a brain tumor vary greatly and depend on the brain tumor's size, location and rate of growth. Headaches that gradually become more frequent and more severe,

- ❖ Unexplained nausea or vomiting,
- ❖ Vision problems, such as blurred vision, double vision or loss of peripheral vision,
- ❖ Gradual loss of sensation or movement in an arm or a leg,
- ❖ Difficulty with balance and speech
- ❖ Feeling very tired and Confusion in everyday matters

Brain tumors affect children and adults and can develop at any age. They're slightly more common in people assigned male at birth (AMAB) than people assigned female at birth (AFAB). More than 18,200 people lost their life because of a malignant brain tumor (brain cancer) in 2022. Males have a 1 in 143 chance of developing brain cancer in their lifetime and a 1 in 188 chance of dying from brain cancer in their lifetime. For females, the chance of developing brain cancer is 1 in 186, with a 1 in 239 chance of dying from the disease.

OUR MODEL

- ❖ CONVOLUTIONAL NEURAL NETWORK IS ONE OF THE MAIN CATEGORIES TO DO IMAGE CLASSIFICATION AND IMAGE RECOGNITION IN NEURAL NETWORKS.
- ❖ SCENE LABELING, OBJECTS DETECTIONS, AND FACE RECOGNITION, ETC., ARE SOME OF THE AREAS WHERE CONVOLUTIONAL NEURAL NETWORKS ARE WIDELY USED.
- ❖ CNN TAKES AN IMAGE AS INPUT, WHICH IS CLASSIFIED AND PROCESS UNDER A CERTAIN CATEGORY SUCH AS DOG, CAT, LION, TIGER, ETC.
- ❖ THE COMPUTER SEES AN IMAGE AS AN ARRAY OF PIXELS AND DEPENDS ON THE RESOLUTION OF THE IMAGE. BASED ON IMAGE RESOLUTION, IT WILL SEE AS $H * W * D$, WHERE H = HEIGHT W = WIDTH AND D = DIMENSION.
- ❖ RESNET-50 IS A 50-LAYER CONVOLUTIONAL NEURAL NETWORK (48 CONVOLUTIONAL LAYERS, ONE MAXPOOL LAYER, AND ONE AVERAGE POOL LAYER).
- ❖ RESIDUAL NEURAL NETWORKS ARE A TYPE OF ARTIFICIAL NEURAL NETWORK (ANN) THAT FORMS NETWORKS BY STACKING RESIDUAL BLOCKS.
- ❖ ACCURACY FOR THE ABOVE MODEL IS 92%.
- ❖ OUR MODEL CLASSIFIES THE DISEASE INTO 4 CLASSES:
 - Metastatic
 - Meningioma
 - Glioblasroma
 - Astrocytoma

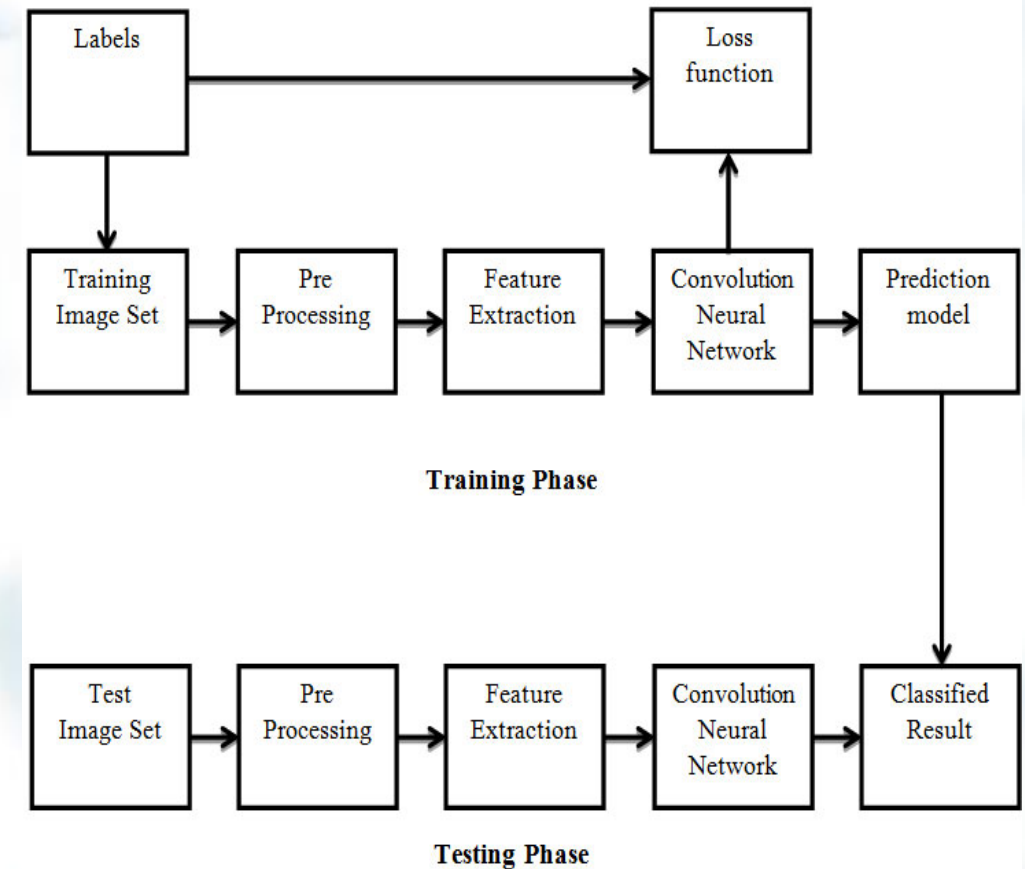


Figure 1: Block diagram of proposed brain tumor classification using CNN



PNEUMONIA

Pneumonia is inflammation and fluid in your lungs caused by a bacterial, viral or fungal infection. It makes it difficult to breathe and can cause a fever and cough with yellow, green or bloody mucus. The flu, COVID-19 and pneumococcal disease are common causes of pneumonia. Bacterial pneumonia is usually more severe than viral pneumonia. Serious symptoms that could be signs of pneumonia:

- ❖ Congestion or chest pain,
- ❖ Difficulty breathing,
- ❖ A fever of 102 degrees Fahrenheit (38.88 degrees Celsius) or higher,
- ❖ Coughing up yellow, green or bloody mucus or spit.

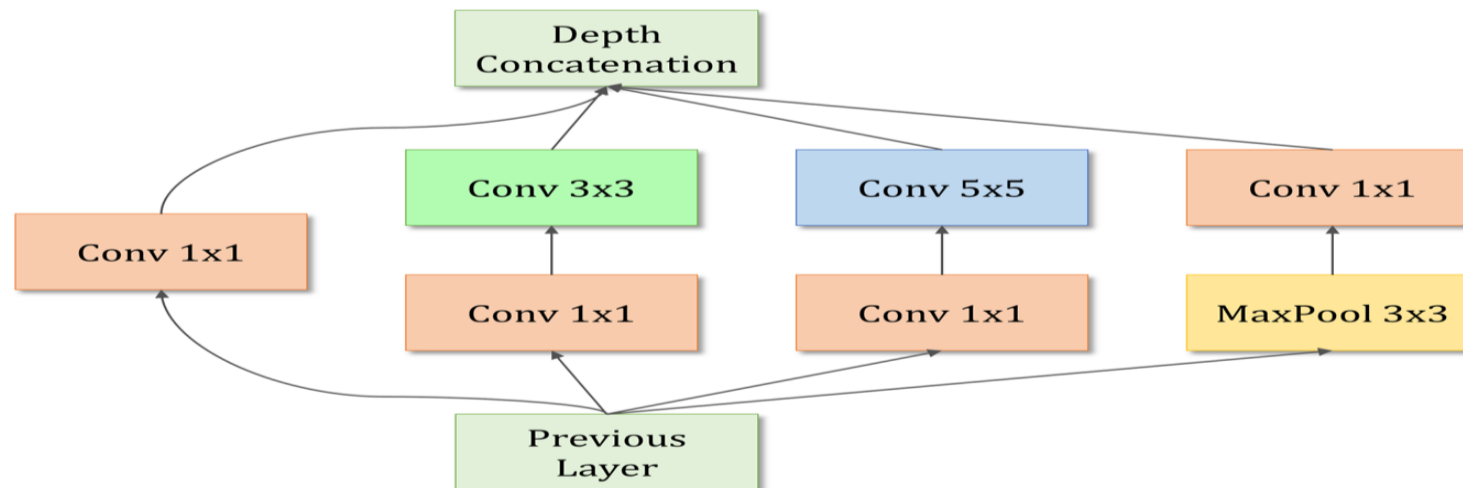
You're at an increased risk of pneumonia if you:

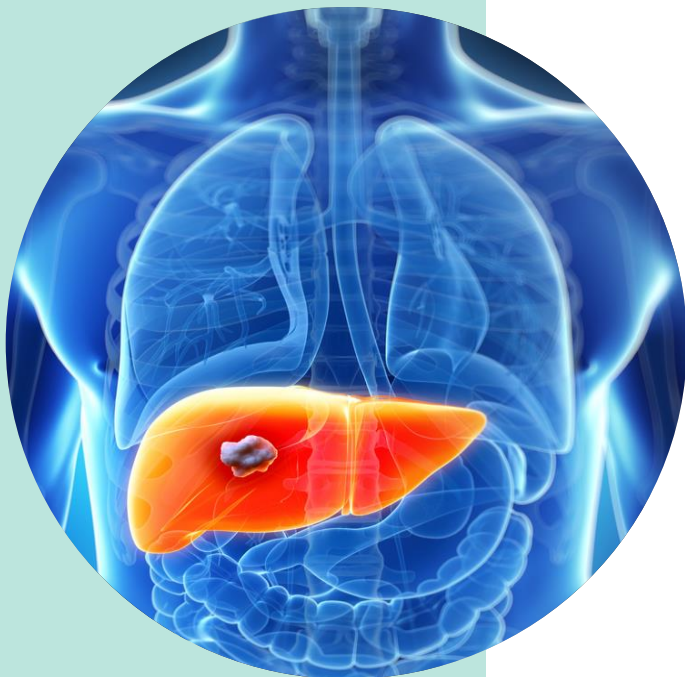
- ❖ Are over the age of 65 and or under the age of 2,
- ❖ Are living with a lung or heart condition,
- ❖ Smoke,
- ❖ Are pregnant,
- ❖ Have a weakened immune system.

It is observed that pneumonia is the largest cause of death in toddlers. Early detection would facilitate in early treatment, hence, saving many lives.

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- ❖ CHEST X-RAY IMAGING IS THE MOST FREQUENTLY USED METHOD FOR DIAGNOSING PNEUMONIA.
- ❖ ACCURACY FOR THE ABOVE MODEL IS 90%.





LIVER CANCER

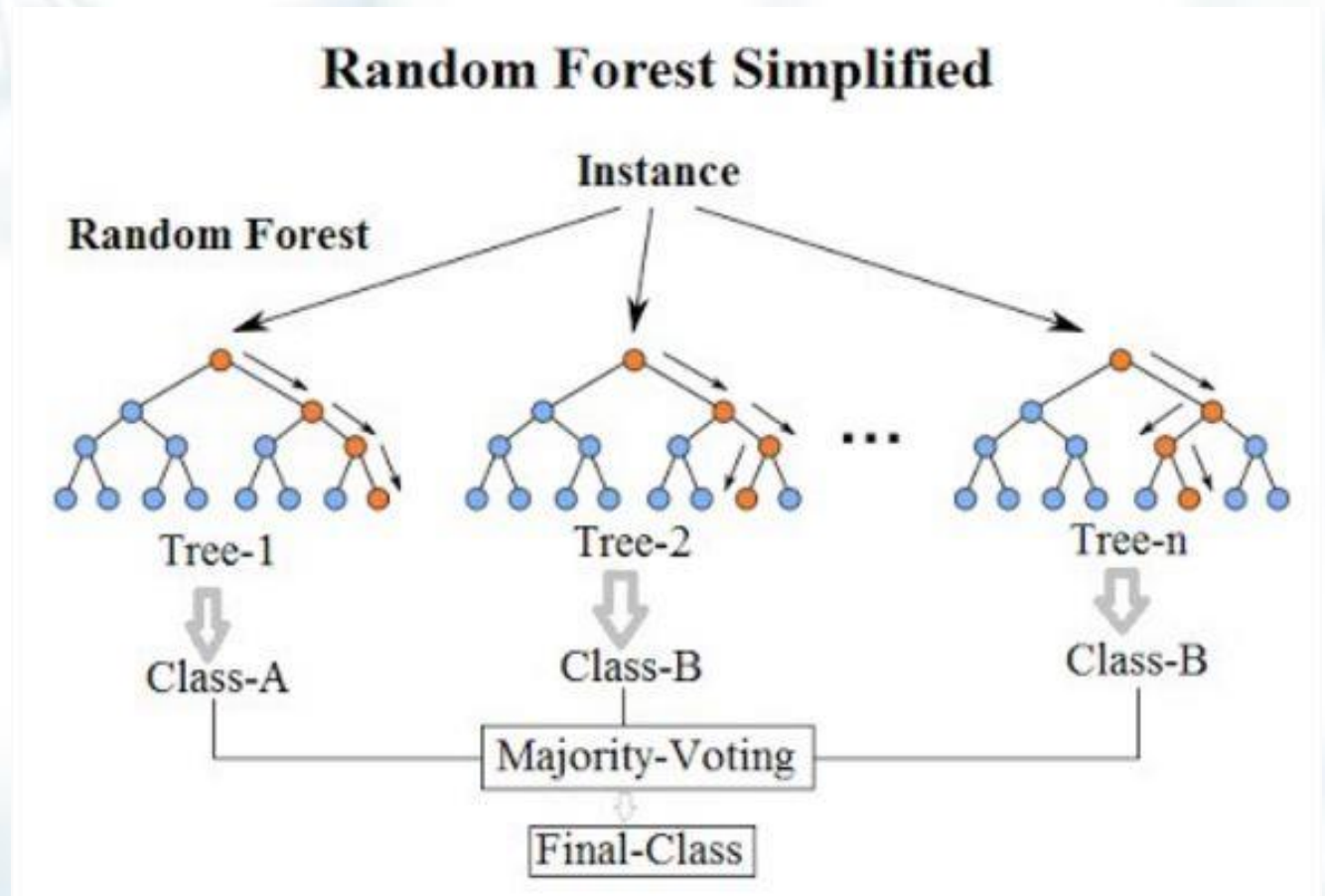
Liver cancer, also known as hepatic cancer, is a type of cancer that affects the liver. There are several different types of liver cancer, but the most common type is called hepatocellular carcinoma, which begins in the cells that make up the liver. Other types of liver cancer include cholangiocarcinoma (which starts in the bile ducts), angiosarcoma (which starts in the blood vessels), and hepatic hemangioma (which is a benign tumor). Symptoms that one should check for are:

- ❖ Losing weight without trying
- ❖ Loss of appetite
- ❖ Upper abdominal pain
- ❖ Nausea and vomiting
- ❖ General weakness and fatigue
- ❖ Abdominal swelling
- ❖ Yellow discoloration of your skin and the whites of your eyes (jaundice) White, chalky stools

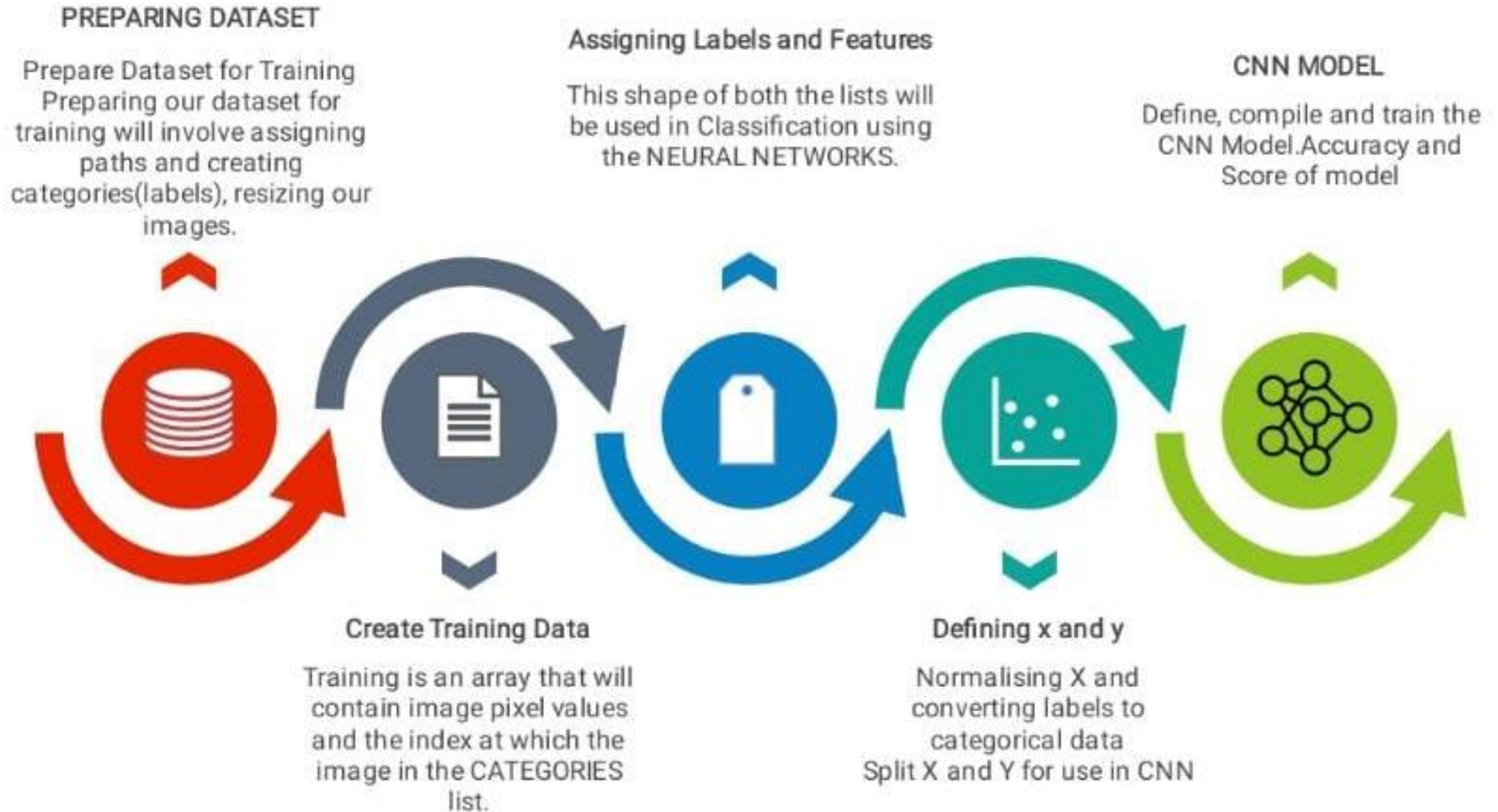
Worldwide, liver cancer is the third leading cause of cancer death. In 2020, an estimated 830,180 people around the world died from the disease.

OUR MODEL

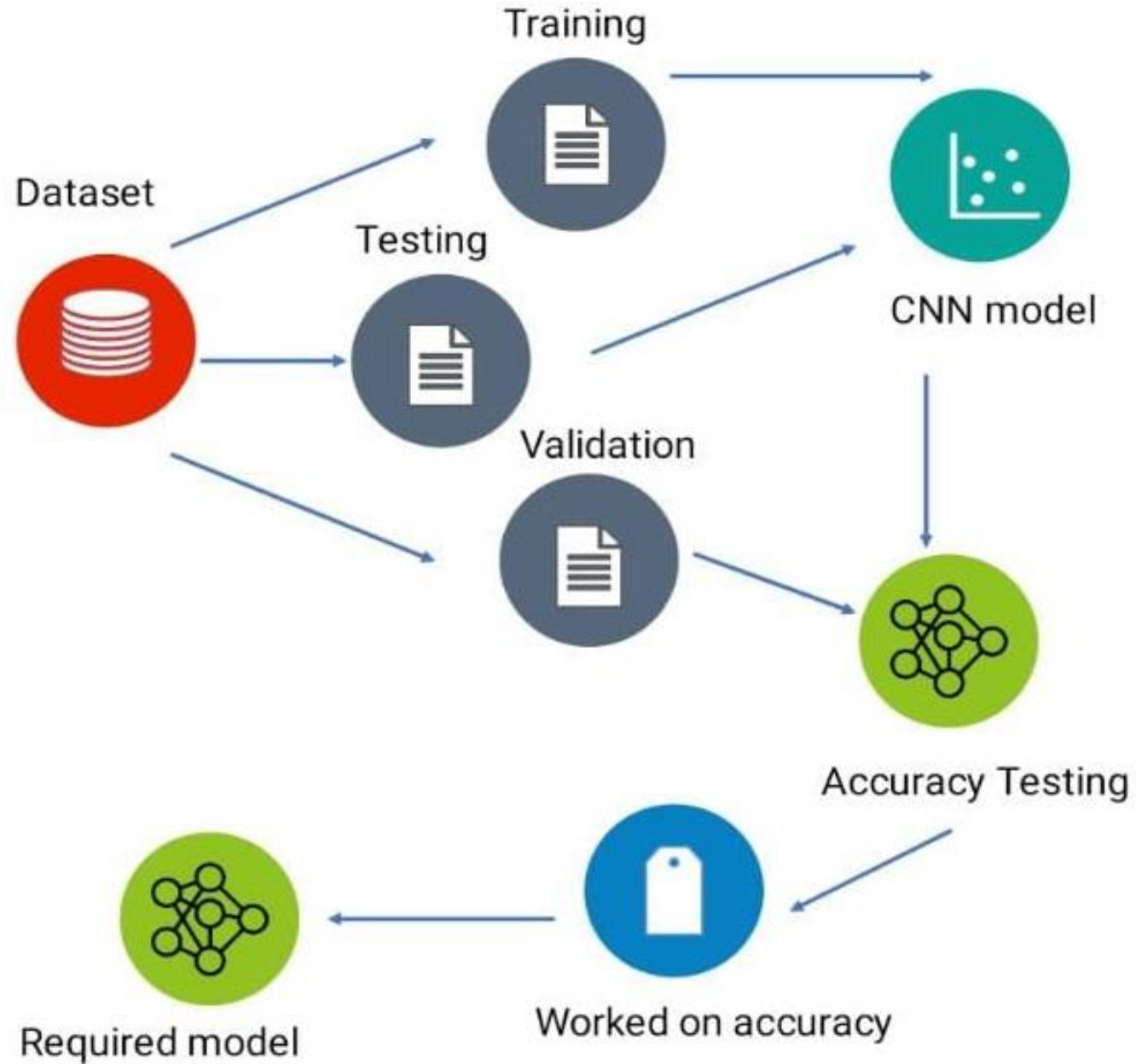
- ❖ LIVER CANCER USES THE SAME MODEL AS CARDIOVASCULAR DISEASES.
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FLOWCHART



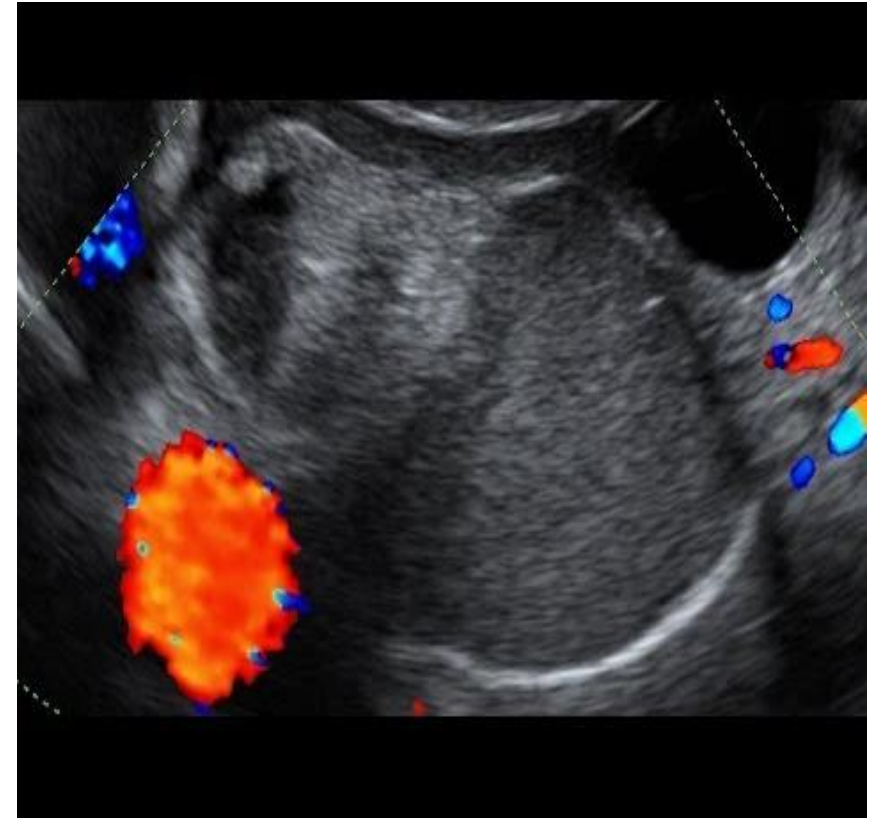
SOLUTION



FUTURE PLANS

VAGINAL CANCER DETECTION

- We plan on working with detection of vaginal cancer.
- Vaginal cancer is difficult to detect and causes a lot of pain to the female.
- The device we are building will directly inserted inside the females vagina to detect the cancer.
- The device will capture the image of the muscle with the high resolution and quality.
- We will be able to detect vaginal cancer without causing any pain to the female.



FITNESS BAND

We plan on impregnating each of the above 4 disease inside a fitness band which will help commercializing our project.

This will save our consumers time and in today's world, "Time is Money".



RESOURCES

CVD's : [Heart Disease Cleveland UCI | Kaggle](#)

BRAIN TUMOR : <https://www.kaggle.com/datasets/navoneel/brain-mri-images-for-brain-tumor-detection>

PNEUMONIA : <https://www.kaggle.com/datasets/paultimothymooney/chest-xray-pneumonia>

LIVER CANCER : <https://www.kaggle.com/datasets/uciml/indian-liver-patient-records>

GITHUB : <https://github.com/Priyans-hu/Dr.-health>



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THANK YOU

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