BONE FRACTURE DETECTION USING DEEP LEARNING

CHODE SURYAVAMSI

INTRODUCTION

- Image processing uses deep learning to draw detailed characteristics from the image.

- So we use deep learning for medical image processing.

- Deep learning is mainly used to draw important features form the inner hidden layers of data that may be images or videos or speech etc.

- As Bone X-Rays contains many pixels, deep learning reaches every pixel of image such that it draws important characters from the image.

- At the end of this project, we have a model to classify whether a particular image is broken or not.

ABSTRACT

- Our project deals with sub part of medical image processing i.e. Bone fracture detection.

- As medical image processing is one of the main domain in which all researchers are working on to simplify the method of classification.

- Medical image processing deals with many medical images such as MRI's, CG scans, X-Rays etc.

- So we can apply machine learning or deep learning algorithms to process these images to find results for other testing data.

- For Bone fracture detection, we are using human bone X-Ray's to classify whether the particular bone of the person is broken or not.

- For this we are using Deep learning approach.

PROPOSED WORK

- We used deep learning for training the model, it is a sub region of machine learning.

- It is used to train the model to predict the output.

- There are many algorithms or methods for training a model in deep learning.

- Based on their particular specifications, we choose CNN(convolutional neural networks) for training our model.

- CNN is primarily used for image classification. As it reaches every pixel of the image which is given under training, it draws important features or characters from the image.

- So we can easily predict the outputs for user input.

MODEL BUILDING-CNN

➢ model = Sequential()

➢ model.add(Conv2D(32 , (3,3) , strides = 1 , padding = 'same' , activation = 'relu')

➢ model.add(MaxPool2D((2,2) , strides = 2 , padding = 'same'))

➢ model.add(Dropout(0.2))

➢ model.add(Flatten())

➢ model.compile(optimizer = "rmsprop")

➢ model.add(Dense(units = 1 , activation = 'sigmoid'))

➢ model.summary()

METHODOLOGY

- CNN has many number of hidden layers, so in each hidden layer the model reaches or gains more facts or features from the image for better classification.

- In CNN, we have many phases such as feature extraction, pooling and classification.
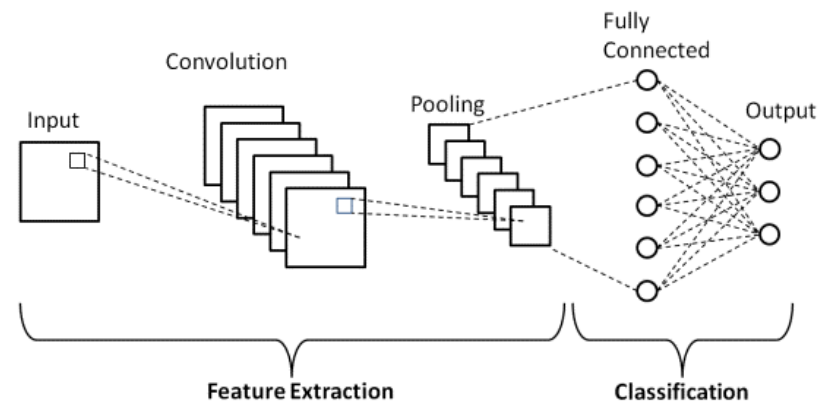
RESULT

- By the end of this project, we can easily classify whether an bone is broken or not by using this machine learning model.

- When we give an image as input, it produces as output as 0(broken) or 1(not broken) based on the results.

```python
#@title
import cv2
img_arr = cv2.imread(os.path.join('/content/drive/MyDrive/x-rays/test/STABLE/10-rotated1-rotated2.jpg'), cv2.IMREAD_GRAYSCALE)
img_arr = img_arr/255
resized_arr = cv2.resize(img_arr, (150, 150))
resized_arr = resized_arr.reshape(-1, 150, 150, 1)
predictions = model.predict(resized_arr)
print(predictions.round())
```

```
1/1 [==============================] - 0s 417ms/step
[[1.]]
```

CONCLUSION

After performing the Bone fracture detection using deep learning, we conclude that we used human bone X-Ray dataset to classify whether the bone is fractured or not. We performed training of the model using classification technique and deep learning method convolutional neural network. We trained the model using CNN, it checks every pixel of the image to get the information from the image and classify the images. Finally, we trained our model and build a system to process the medical images and find the injury of the bones through it.