**Author:**

*MD Fakrul Islam  
Certified Data Scientist, ML Model Deployment/Integration Specialist, and AI Solution Consultant  
Cell: +8801954345778 and +8801755524211  
Skype-fakrul.islam*

*Email: fakruldsebd@gmail.com*[*https://www.linkedin.com/in/fakrul-islam-bd/*](https://www.linkedin.com/in/fakrul-islam-bd/)

**Data Processing Pipeline:**

Read “Target Data\_2019-12-05.xlsx” ------🡪

Extract Benign and Malignant CSV -------🡪

Understand Shapes for unform distribution of data -------🡪

Extract Ultrasound/MRI Images -------🡪

**Model Development Pipeline:**

Make CNN models by pretrained models using transfer learning (**81% validation accuracy**) ------🡪

Make Fusion models by CNN+ ML Models (**88% validation accuracy**)

**Data Processing and Model Developments:**

1. Read the Data Details Excel and generate the benign and malignant CSVs

(Target Data\_2019-12-05.xlsx)

ULTRASOUND\_MRI\_DICOM\_DATA\_EXTRACTOR\_CSV.ipynb

1. Read Benign and Malignant CSV, captures shape and dump as CSV

dicom\_shape\_frame\_identification.py

1. Read Shape CSV and dump ultrasound or mri images

extract\_images\_shapes.py

ULTRASOUND\_DICOM\_2\_PNG\_IMAGE\_Generator.ipynb

MRI\_DICOM\_2\_JPG\_IMAGE\_Generator.ipynb

1. CNN Models developments

Ultrasound\_Prostate\_Cancer\_Detection\_vgg16\_vgg19\_MobileNetV2\_ResNet50V2\_ResNet101V2\_ResNet152V2\_InceptionResNetV2\_InceptionV3\_Xception.ipynb

MRI\_Prostate\_Cancer\_Detection\_vgg16\_vgg19\_MobileNetV2\_ResNet50V2\_ResNet101V2\_ResNet152V2\_InceptionResNetV2\_InceptionV3\_Xception.ipynb

1. Fusion Model Development (CNN+ ML)

deep\_ml\_fusion.py

1. Explain the prediction by Explainable AI

(Super Pixels, perturbed image)

us\_lime\_Prostate\_Cancer\_Detection\_mn2.ipynb

mri\_lime\_Prostate\_Cancer\_Detection\_mn2.ipynb

\*Note:

How to read a Dicom file

read\_dicom.py

Only ML Models (93% accuracy for Gradient Boosting)

sklearn\_model.py

Load processed data from pickle files

saved\_pickle\_2\_models.py