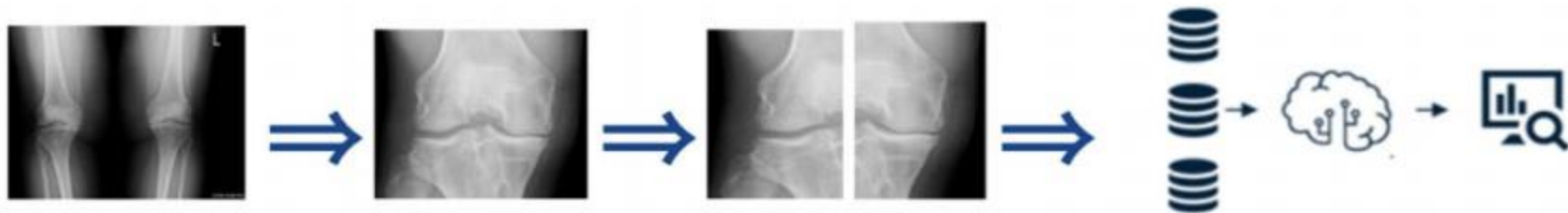# Medical Image Diagnostics Assistance System (MIDAS)

A Practical Guide on How Artificial Intelligence can be used for Medical Image Diagnostics

MIDAS Features

- MIDAS is Accion's Machine Learning based Medical Image processing and Diagnosis detection platform
- Supports DICOM, JPEG and other image formats
- Supports multiple pre-processing algorithms for ROI extraction
- Supports classification algorithms and techniques such as Convolution Neural Network (CNN), Support Vector Machine (SVM) and others
- Native and Cloud based support

Three Key Components of Image Processing in MIDAS

1. Image Pre-processing including Enhancements and Transformations

1. Region of Interest (ROI) Extraction Or Object Localization

1. Object Classification

Image Preprocessing - Enhancement and Transformation

- Histogram Equalization
- Morphological Transformations
  - Erosion
  - Dilation
  - Opening
  - Closing
- Alpha Transformation
- Beta Transformation
- Edge Detection
- Segmentation
- Contouring

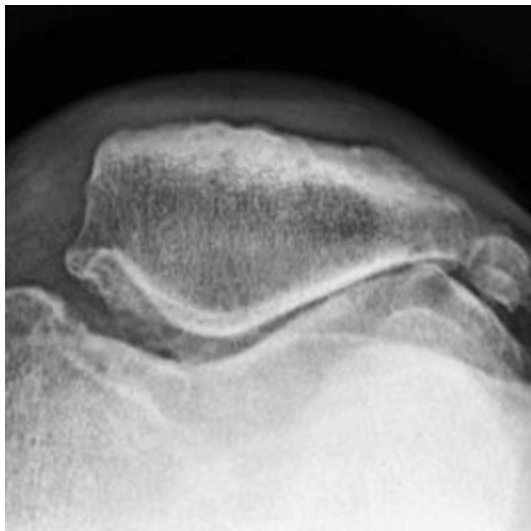# Image Enhancement and Transformation

Histogram Equalization
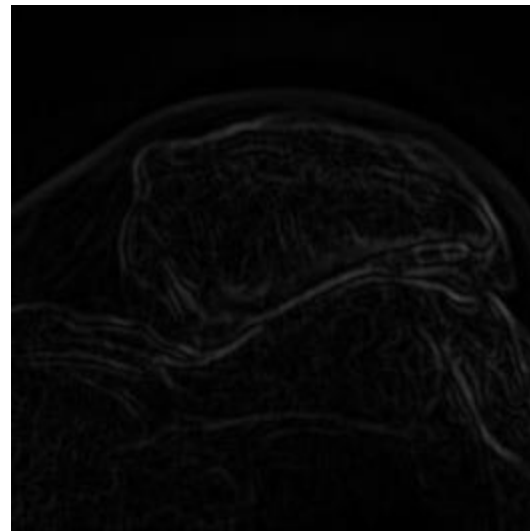

Before

After

Image Enhancement and Transformation

Edge Detection

Before

After

Image Enhancement and Transformation
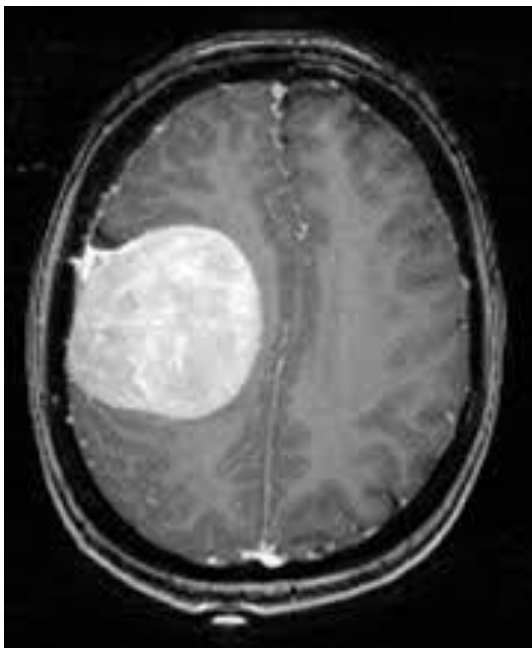
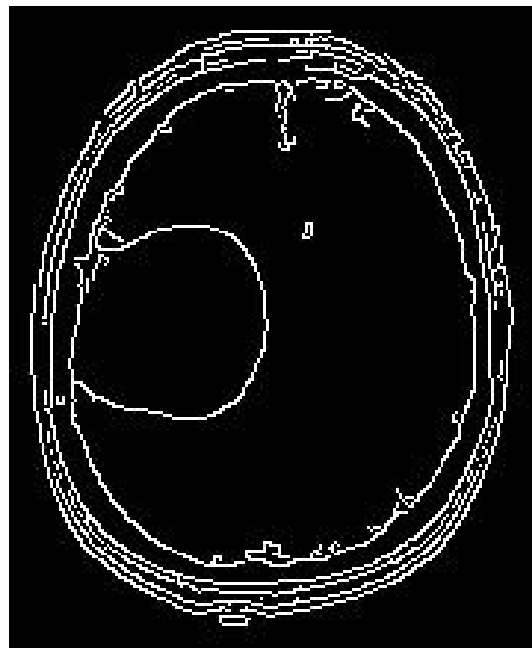## Alpha-Beta Transformation

Before

After

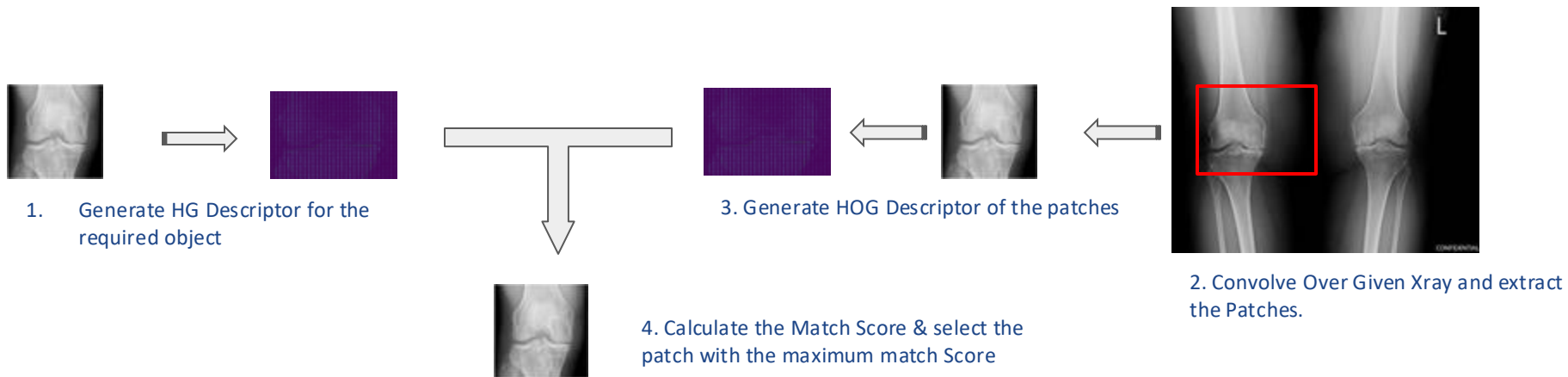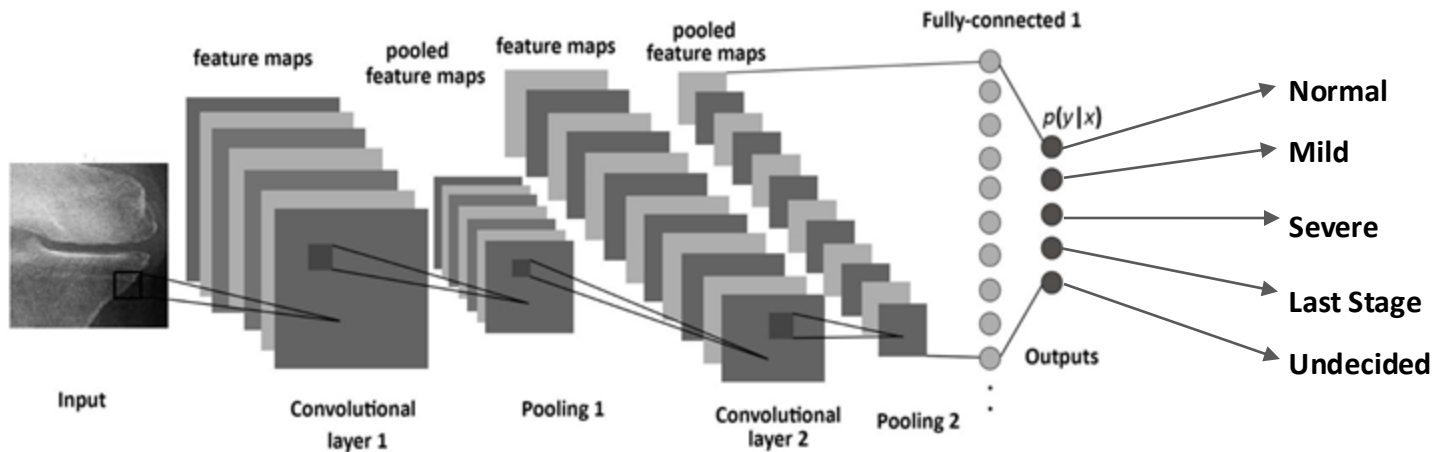# Image Enhancement and Transformation

Contouring

Before

After

Region of Interest (ROI) Extraction Or Object Localization

Based on Feature Extraction using Histogram of Oriented Gradient (HOG)

1. Generate HG Descriptor for the required object

3. Generate HOG Descriptor of the patches

2. Convolve Over Given Xray and extract the Patches.

4. Calculate the Match Score & select the patch with the maximum match Score

Object Classification

Object Classification using Convolutional Neural Networks (CNN)

Thank You