

Computer Vision 2023 Project [CSYS]

Multi-Cancer Classification

Identification of different Cancer diseases is to determine first the type of scan (breast or brain in our case) and then determining whether the scan is normal or has a tumor and the type of tumor if exists.

In this project you will be tasked with identifying to whom a handwritten signature belongs to and whether it is real or forged through a multistage pipeline.

Project Objectives:

- 1- Apply different Image preprocessing techniques
- 2- Apply Image Classification to classify each image whether it is a brain scan or a breast scan
- 3- Determine if the image scan is normal or if it has an infection (Tumor).
3. To be Announced

Minimum Requirements:

- a. You have to use at least two different methods for the two stages.
- b. You cannot use pixels directly as features in case of classical computer vision. You have to use a feature extraction method first (e.g BoW using SIFT) and then use a classifier like SVM or logistic regression (You have to use two different extraction methods for the two stages, for example BoW for stage 1 and another method for stage 2).

Dataset Descripton

The dataset which can be found [\[here\]](#) consists of the following folders/files:

1- Brain Cancer

1- Tumor

- Train (Images that will be used for training the model)
- Test (Images that will be used for testing the model)

2- No Tumor

- Train (Images that will be used for training the model)
- Test (Images that will be used for testing the model)

2- Breast Cancer

a. Benign

- Train (consists of the training images)
- Test (consists of the testing images)

b. Malignant

- Train (consists of the training images)
- Test (consists of the testing images)

c. Normal

- Train (consists of the training images)
- Test (consists of the testing images)

Example of a benign breast cancer



Example of a brain cancer with tumor



Practical Exam Project Deliverables:

1. Apply different Image Preprocessing and Enhancement techniques on the dataset.
2. Apply Image classification to classify the given scan to “Breast” or “Brain” (1st stage classification)
3. After determining the type of scan from the previous step then we determine whether the scan is normal or has infection (2nd stage classification)
4. If you trained a deep learning model using a notebook (optional), you must deliver the notebook with the output cell saved displaying the training logs. If you trained the model using IDE (i.e Pycharm). **You must deliver screenshots of the training process.**
5. A Report that includes description of:
 - Your data preparation process.
 - Brief description of the models and techniques used in each task.
 - Training and Testing times for each model.
 - Image Classification training and testing accuracy.
 - Provide screenshots of the test sets classification with visualization.