SPOTTING LUNG AND COLON CANCER USING HYBRID ENSEMBLE LEARNING

VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY

Under the Supervision of

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Contents

Proposed system with Advantages

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- In this proposed model we use a hybrid approach which is a combination of CNN model and Optimizer techniques.
- We have covered image pre-processing, deep feature extraction, optimizer, confusion matrix
- We also give a basic CNN algorithm with an Optimizer that are used to detect lung and colon cancer efficiently.
- Proposed model using feature extraction and CNN algorithm on LC25000 lung and colon histopathological image datasets to assure a prognosis of lung and colon cancer.
- Image classification and Segmentation analyze.
- Less amount of Time and low budget to recovery of patients.
- Histopathalogy is main role in Fast performance.

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Software Requirements

- Operating System : Microsoft Windows 08 or above
- Code Editor : Google colab
- Languages : Python 3.7 or above
- Libraries : Pandas, Numpy, Matplotlib, Keras, Scikit-learn

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Hardware Requirements

- Hard disk : 1TB HDD
- Ram : 4GB or above
- Processor : i3 or above

Functional Requirements

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- **Data preprocessing**: The ability to clean and prepare the data for training and testing the models.
- **Feature extraction:** The ability to extract relevant features from the data that can be used to train the models.
- **Model training**: The ability to train the selected models on the processed and feature-extracted data using CNN models such as VGG16, VGG19.
- **Model deployment**: The ability to deploy the trained models in a clinical setting for real-time prediction of lung cancer.
- **Model monitoring** : The ability to monitor the performance of the deployed models over time and update them as needed.

Non-functional requirements

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- **Performance**: The system should have a fast processing time for real-time predictions and a high accuracy rate for detecting lung cancer.
- **Scalability**: The system should be able to handle a large amount of data and be able to adapt to changing data sizes and types.
- **Usability**: The system should be user-friendly for radiologists and medical professionals, and provide clear and easy-to-understand results.
- **Security**: The system should be able to protect patient data and prevent unauthorized access.
- **Maintainability**: The system should be easy to maintain and update over time.
- **Availability**: The system should be available and accessible to users when needed, with minimal downtime.

System Architecture

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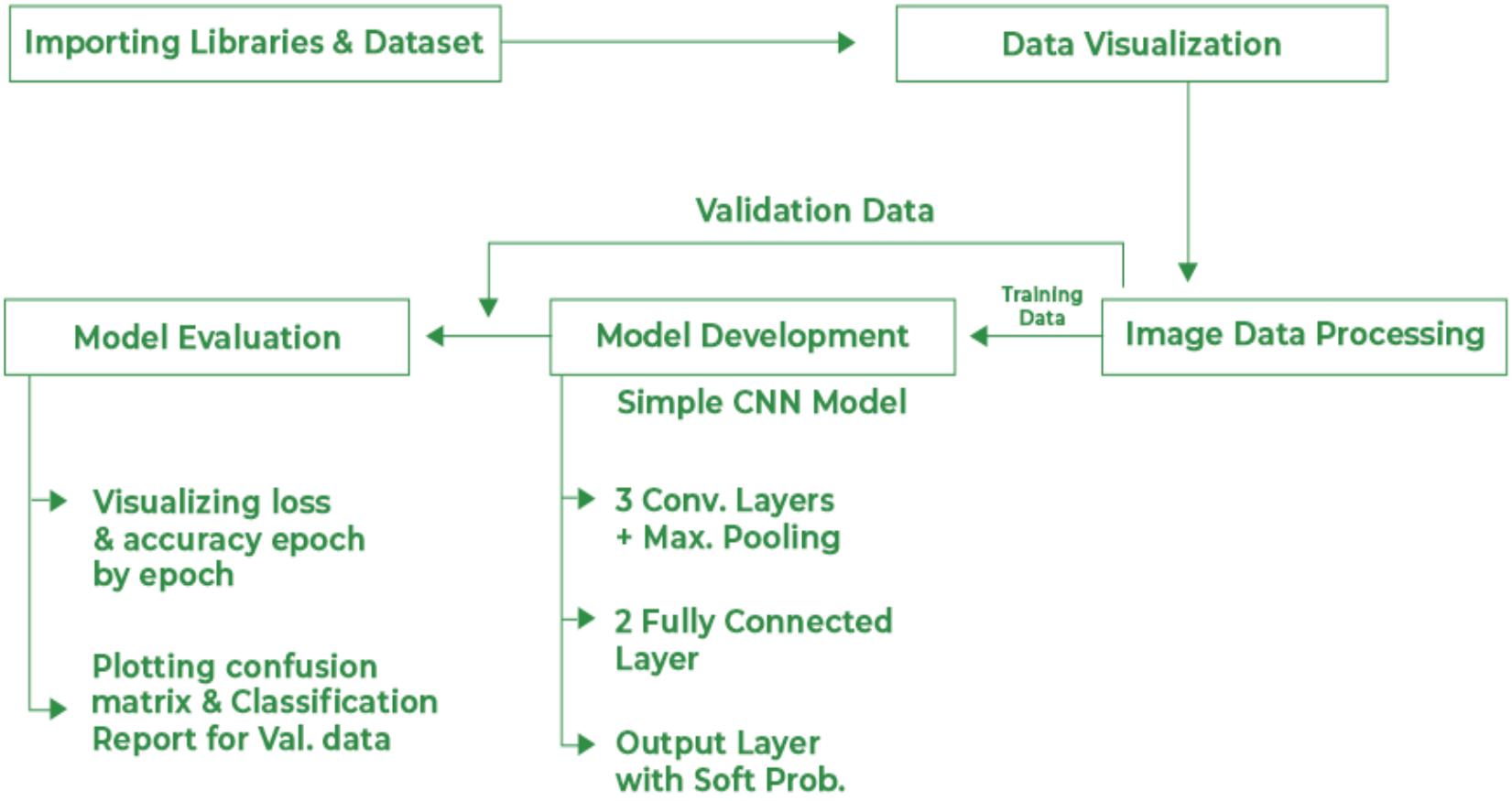

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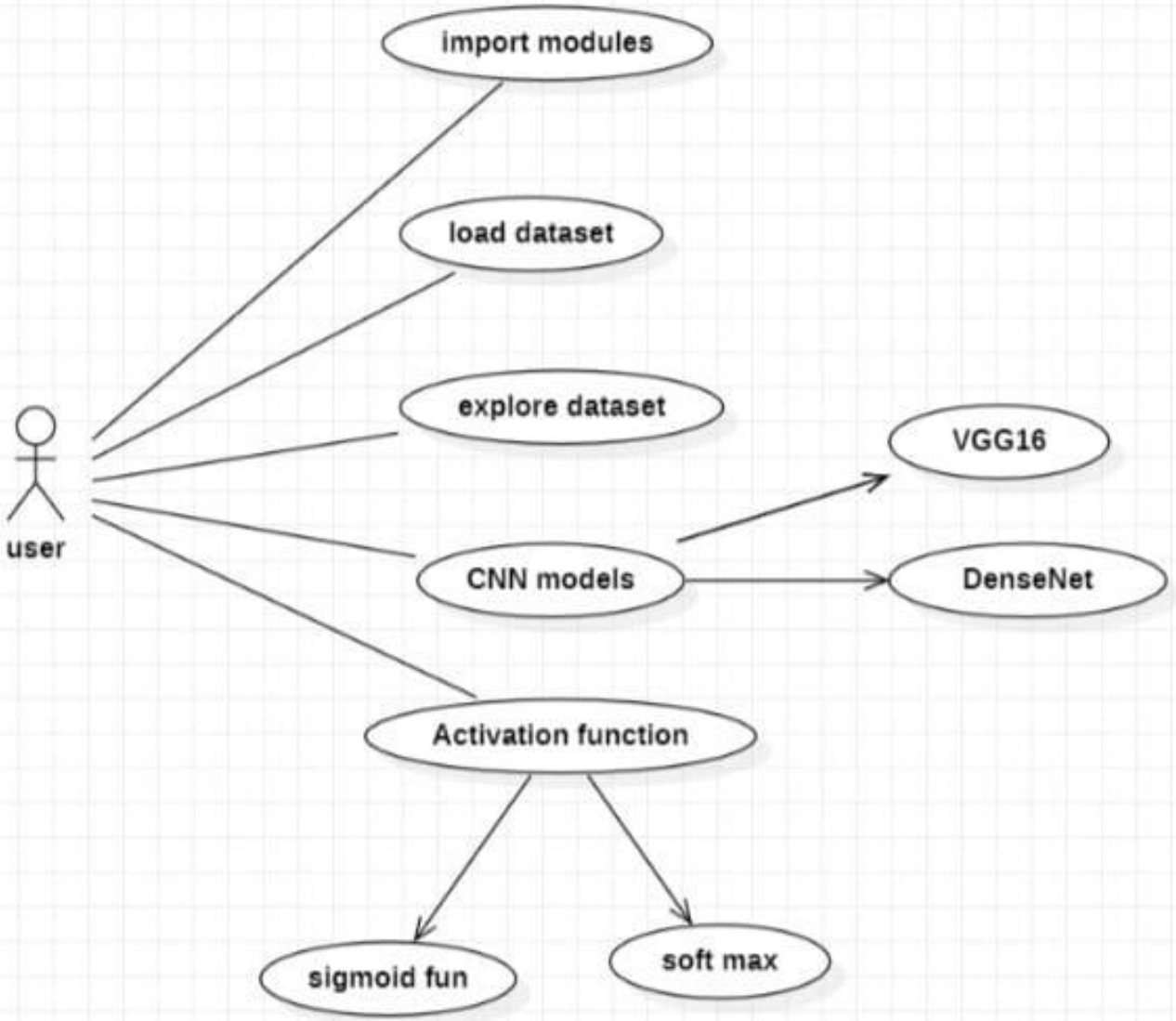
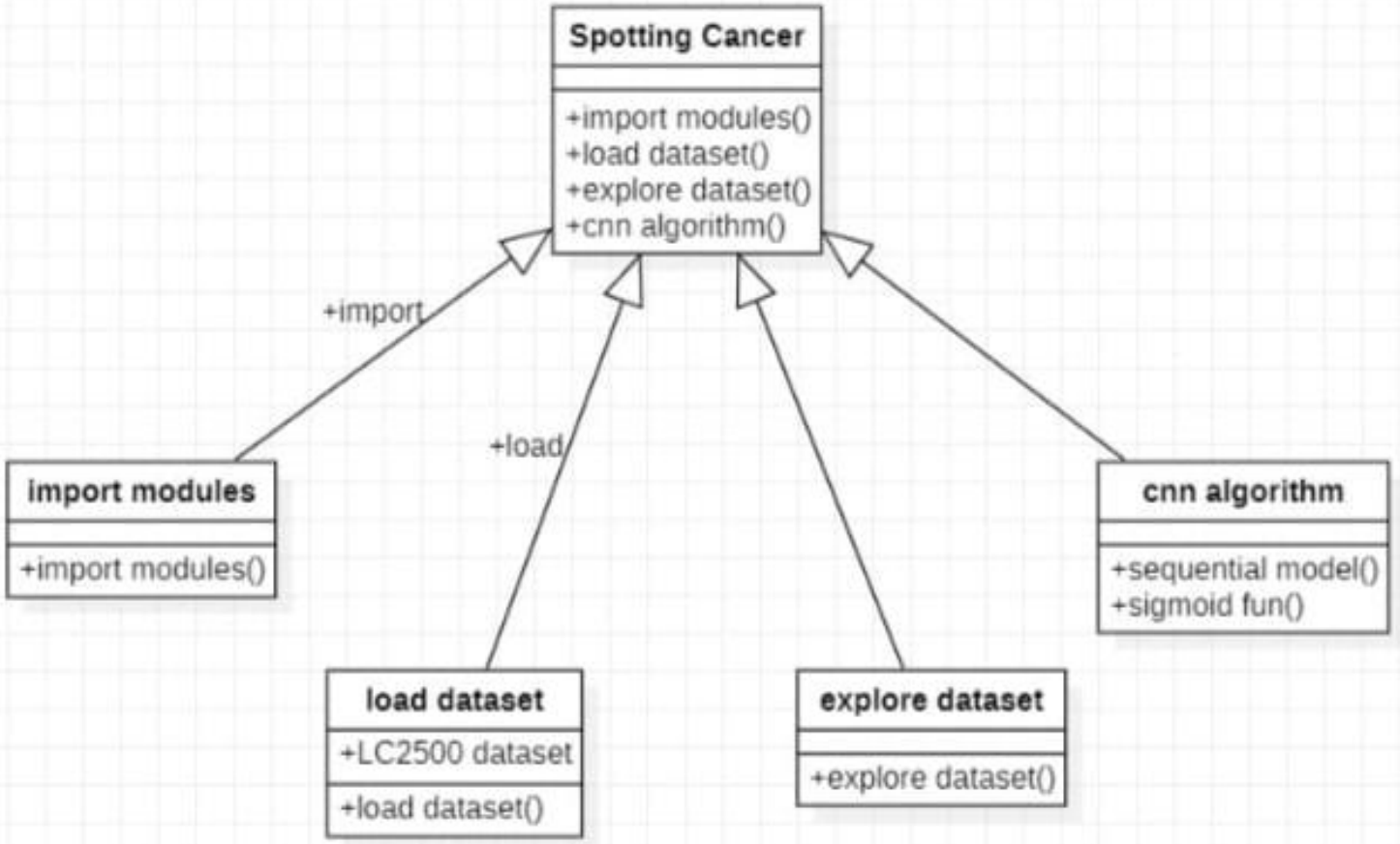
System Design

- **Use Case Diagram** :Use case diagram is a diagram showing a series of use cases and actors of use and their relation.
- Graphically it is made as a solid line ellipse, with only its name included.

- The main actors of Recognition of Sign Language System are:
- 1) User
- 2) System
- 3) Web Cam


import modules
load dataset
explore dataset
VGG16
user
CNN models
DenseNet
Activation function
sigmoid fun
soft max

- **Class Diagram**: Class diagrams model class structure and contents using design elements such as classes, packages and objects.
- Classes are composed of three things: name, attributes, and operations.
- Class Diagram association relationship is most common relationship in a class diagram.
- The association shows the relationship between instances of class.


Spotting Cancer
+import modules()
+load dataset()
+explore dataset()
+cnn algorithm()
+import
+load
import modules
+import modules()
load dataset
+LC2500 dataset
+load dataset()
explore dataset
+explore dataset()
cnn algorithm
+sequential model()
+sigmoid fun()

- **Sequence Diagram**: Sequence diagrams also called as INTERACTION DIAGRAMS.
- An interaction diagram represents an interaction, which consists of a series of objects and their relationship and the messages that can be exchanged between them.
- A sequence diagram empathizes the time ordering of messages.
- Graphically a sequence diagram is a table that shows objects arranged along the X-axis and messages ordered in increasing time along the Y-axis.

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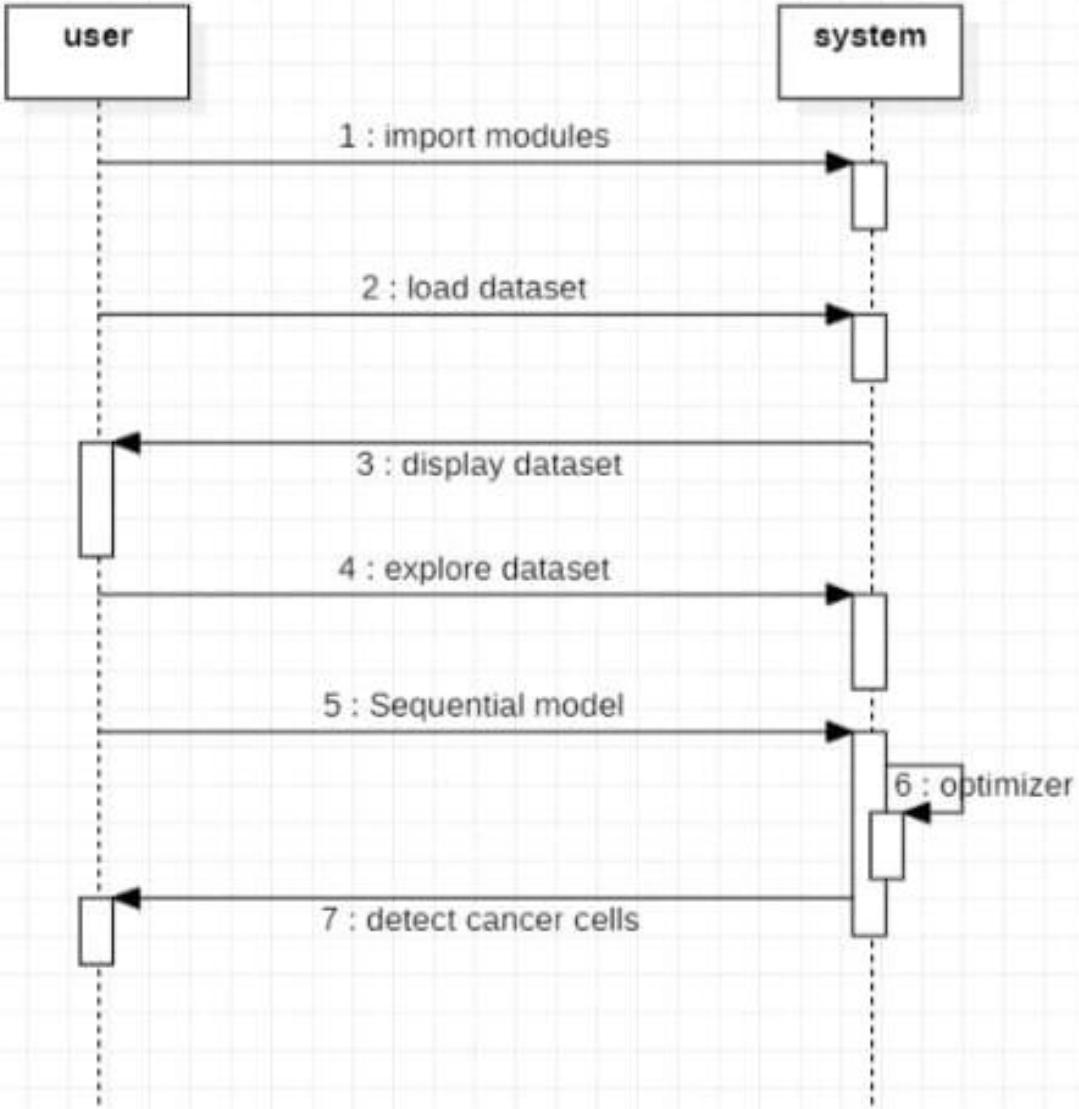

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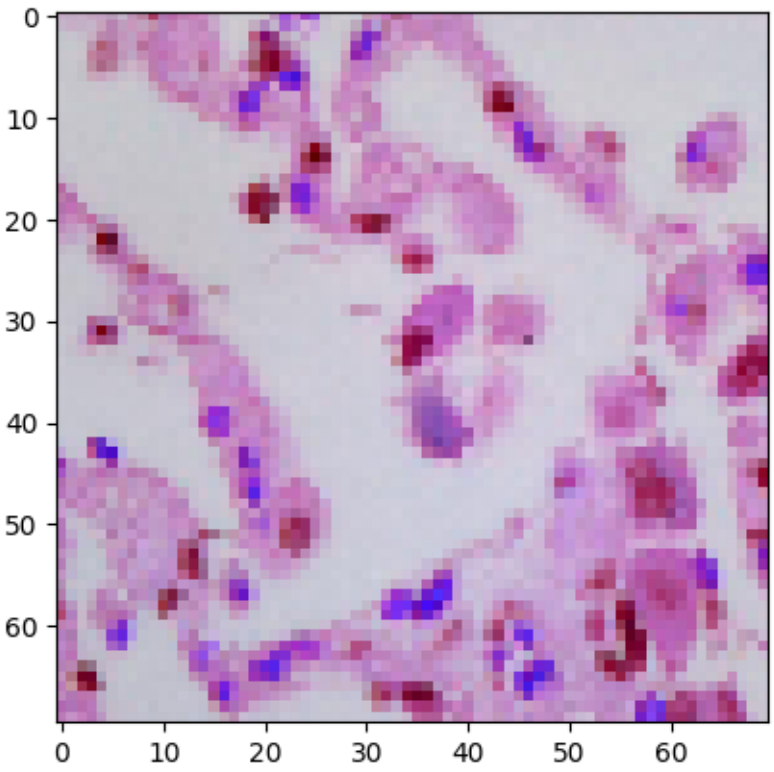
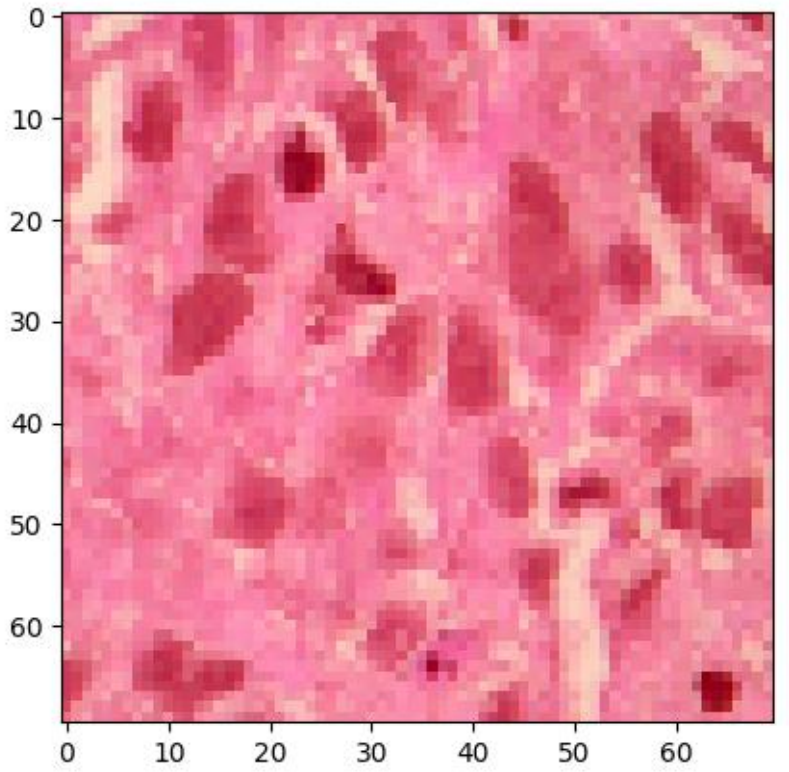
Output Screens

Before :



Predict val: lung_scc

After :



Real val : lung_scc

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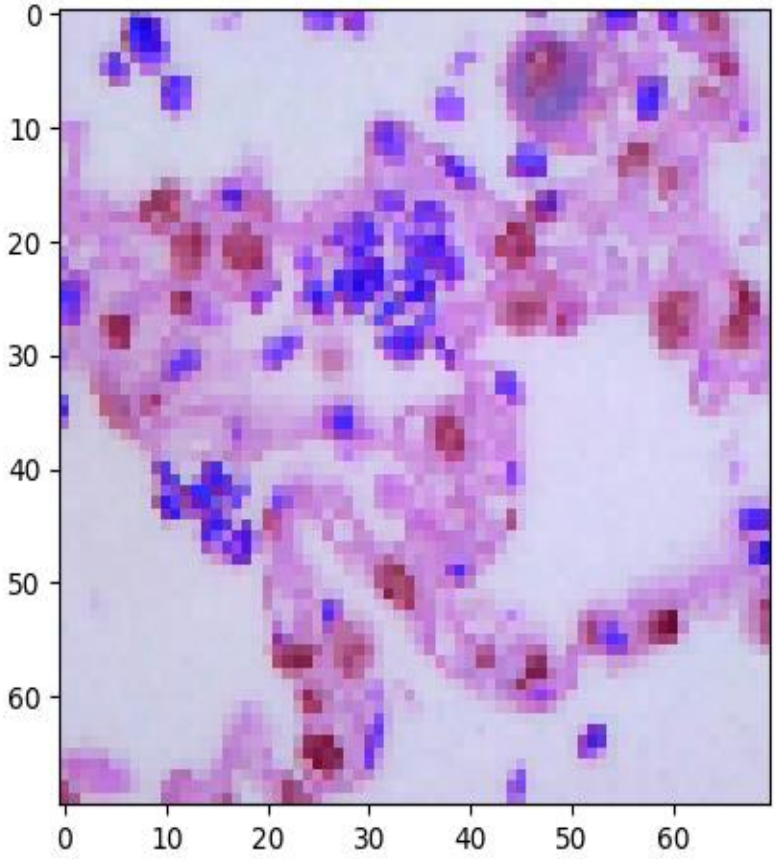
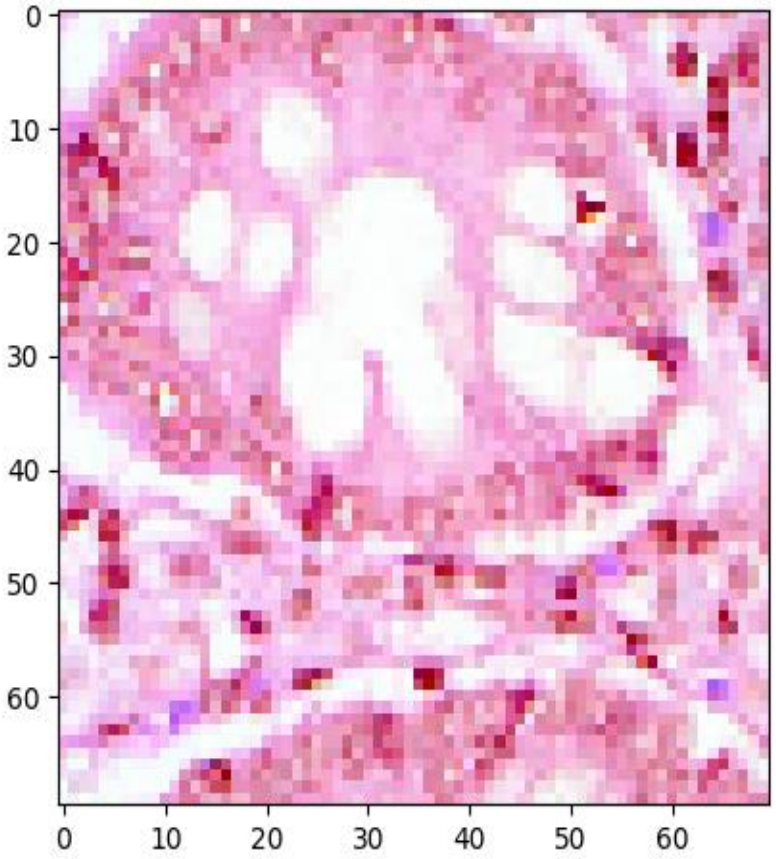
Before :



Predict val : Colon_aca

After:



Real val : colon_aca

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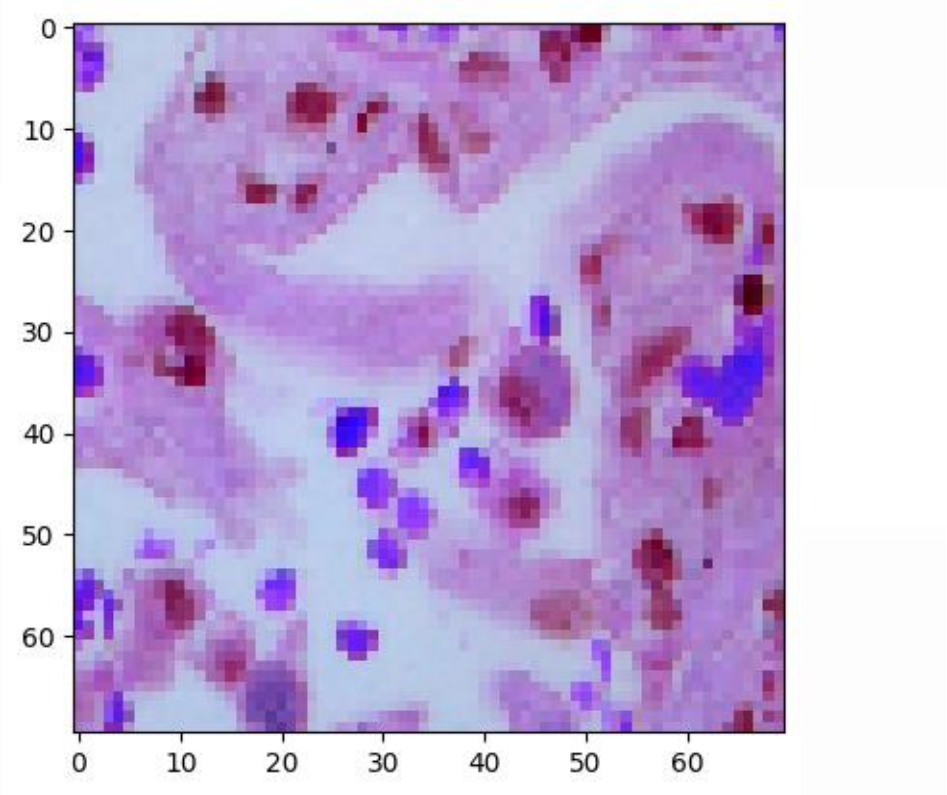
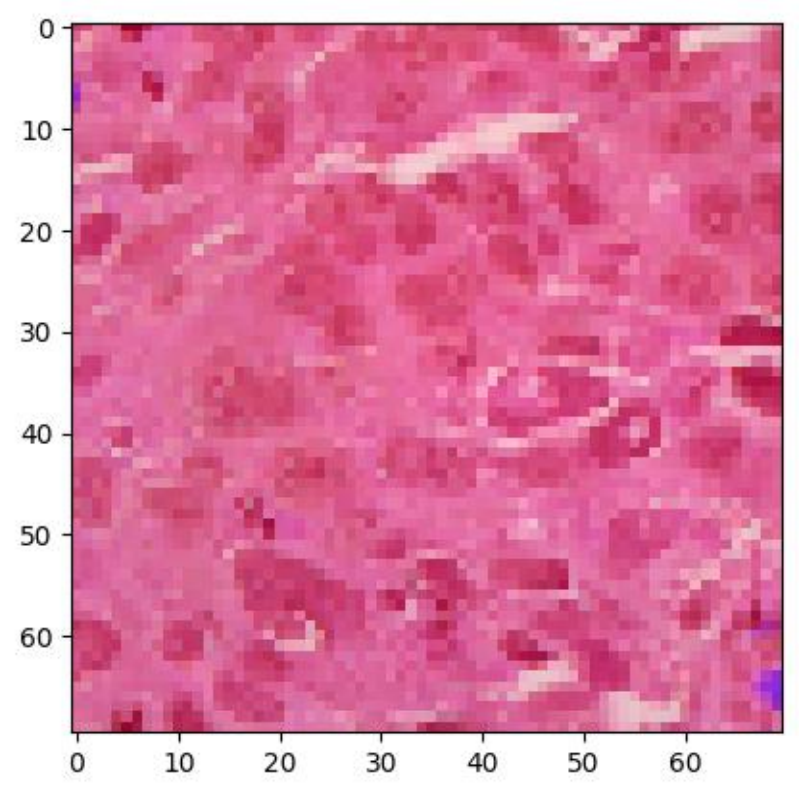
Before :



Predict val : lung_aca

After :



Real val : lung_aca

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