Breast Cancer

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Batch code: LISUM32

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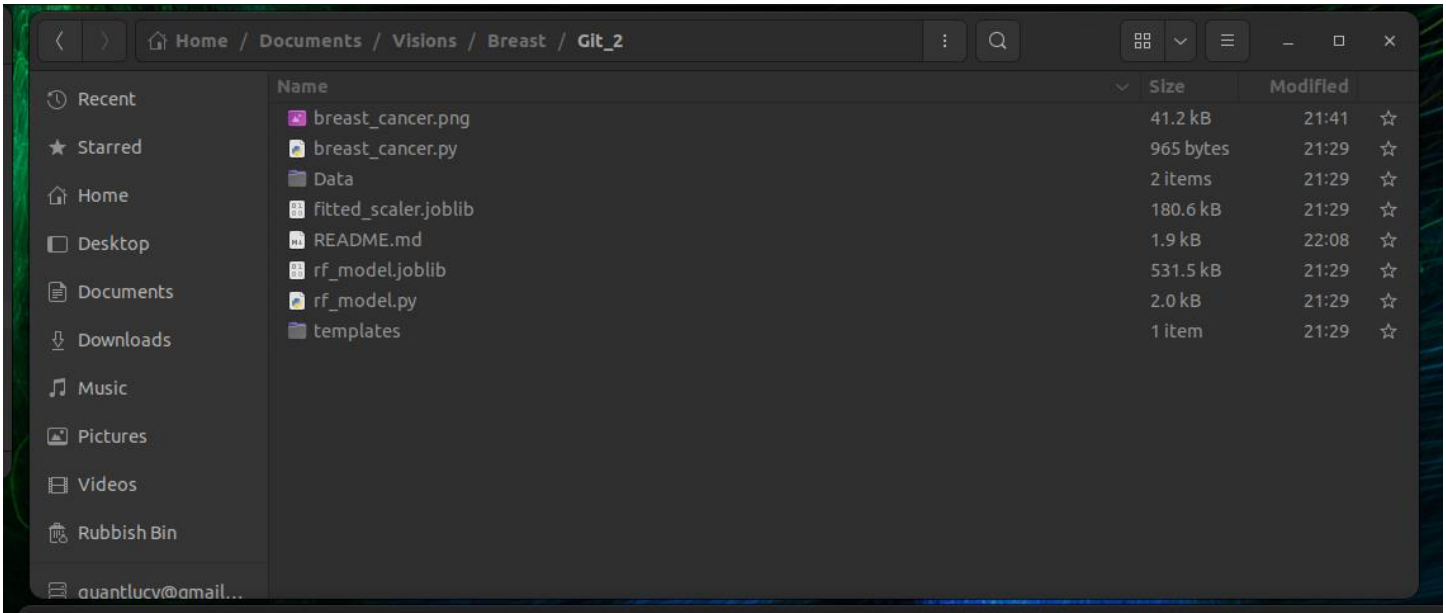
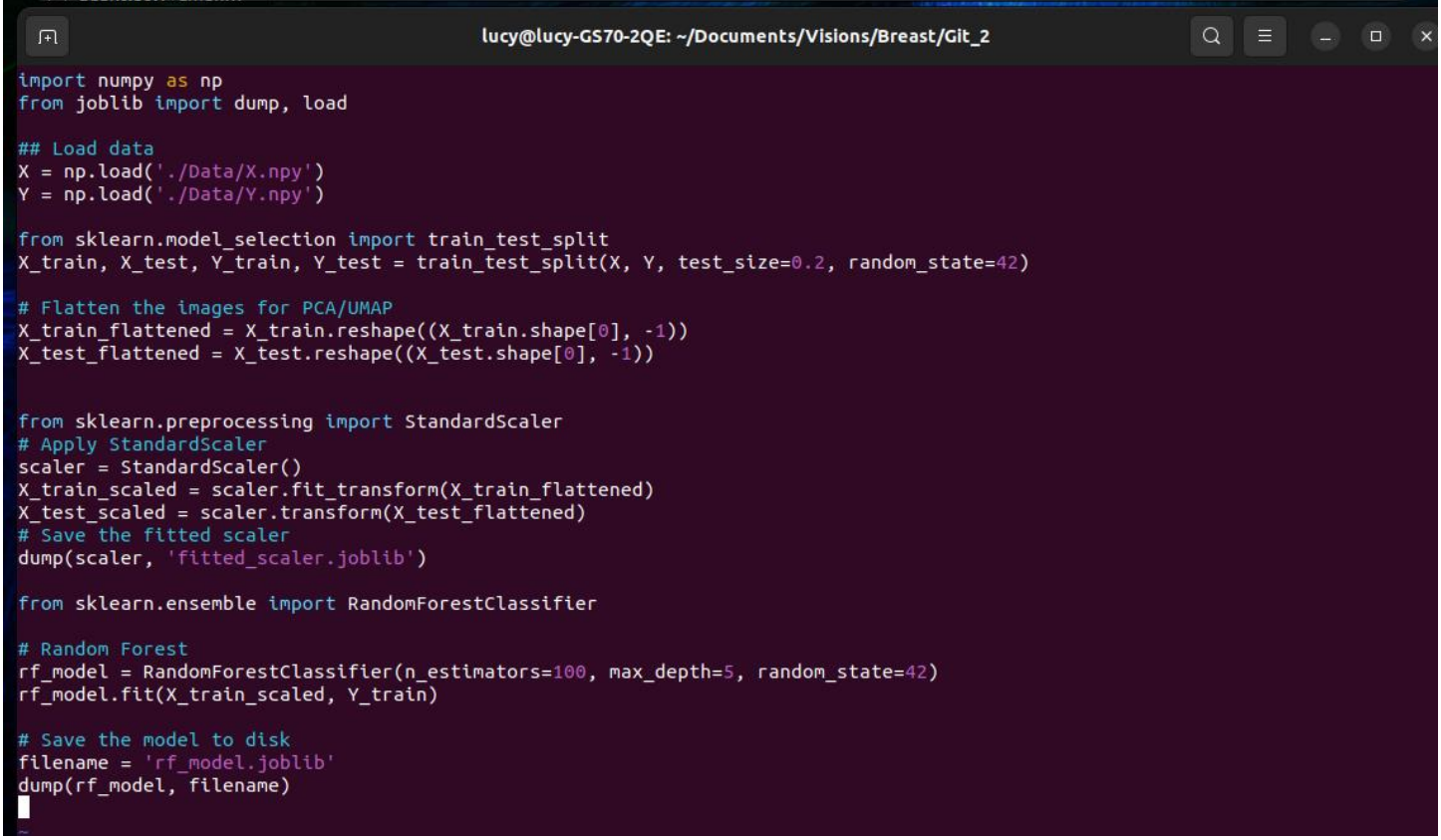
FILES STRUCTURE & ML MODEL





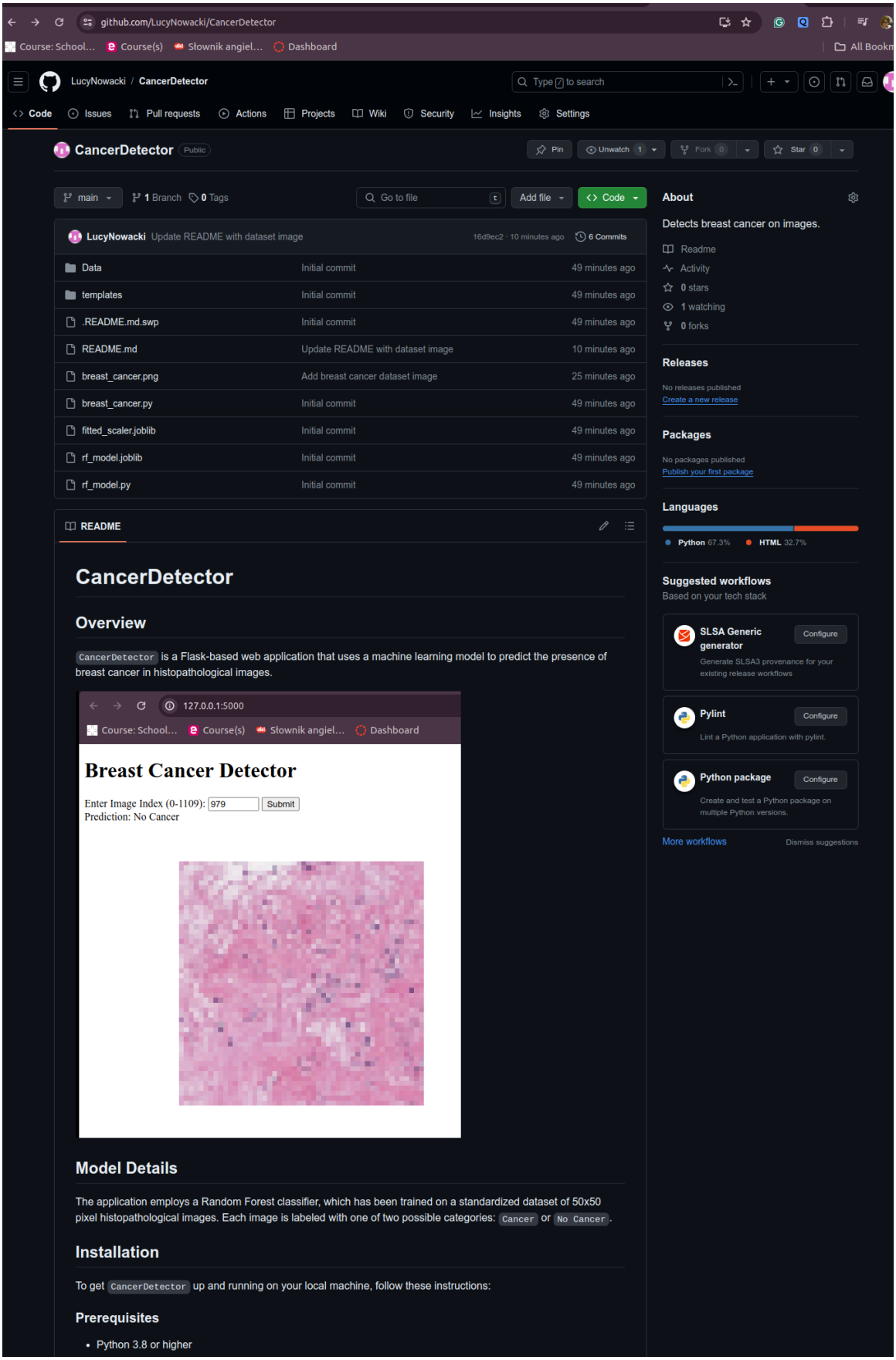

```
import numpy as np
from joblib import dump, load

## Load data
X = np.load('./Data/X.npy')
Y = np.load('./Data/Y.npy')

from sklearn.model_selection import train_test_split
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2, random_state=42)

# Flatten the images for PCA/UMAP
X_train_flattened = X_train.reshape((X_train.shape[0], -1))
X_test_flattened = X_test.reshape((X_test.shape[0], -1))


from sklearn.preprocessing import StandardScaler
# Apply StandardScaler
scaler = StandardScaler()
X_train_scaled = scaler.fit_transform(X_train_flattened)
X_test_scaled = scaler.transform(X_test_flattened)
# Save the fitted scaler
dump(scaler, 'fitted_scaler.joblib')

from sklearn.ensemble import RandomForestClassifier

# Random Forest
rf_model = RandomForestClassifier(n_estimators=100, max_depth=5, random_state=42)
rf_model.fit(X_train_scaled, Y_train)

# Save the model to disk
filename = 'rf_model.joblib'
dump(rf_model, filename)
```

FLASK IMPLEMENTATION

lucy@lucy-GS70-2QE: ~/Documents/Visions/Breast/Git_2

```python
from flask import Flask, request, jsonify, render_template
from joblib import load
from sklearn.preprocessing import StandardScaler
import numpy as np
import os

import base64
from io import BytesIO
import matplotlib.pyplot as plt
import matplotlib
matplotlib.use('Agg')

app = Flask(__name__)

# Load the model and scaler at app startup
model_path = os.path.join('/home/lucy/Documents/Visions/Breast/Git_1', 'rf_model.joblib')
model = load(model_path)
scaler_path = '/home/lucy/Documents/Visions/Breast/Git_1/fitted_scaler.joblib'
scaler = load(scaler_path)

@app.route('/')
def index():
    # Display the form for user input
    return render_template('index.html')


@app.route('/predict', methods=['POST'])
def predict():
    try:
        image_index = int(request.form['image_index'])
        X = np.load('./Data/X.npy')  # Load data

        print("Selected image shape:", X[image_index].shape)  # Should print (50, 50, 3)

        # Flatten the image for prediction
        image_flat = X[image_index].reshape(-1)  # Flatten the image
        print("Flattened image shape:", image_flat.shape)  # Should print (7500,)

        # Transform the data using the pre-fitted scaler
        image_scaled = scaler.transform([image_flat])  # Make sure it's a 2D array for scaling

        # Predict using the loaded model
        prediction = model.predict(image_scaled)
        result = 'No Cancer' if prediction[0] == 0 else 'Cancer'

        # Convert image to Base64 for displaying
        fig, ax = plt.subplots()
        ax.imshow(X[image_index])  # Use original shape for displaying
        ax.axis('off')
        buf = BytesIO()
        plt.savefig(buf, format='png')
        plt.close(fig)
        image_base64 = base64.b64encode(buf.getvalue()).decode('utf-8')
        buf.close()

        return jsonify({'prediction': result, 'image': image_base64})
    except Exception as e:
        return jsonify({'error': str(e)}), 500

if __name__ == '__main__':
    app.run(debug=True)
```

GITHUB DEPLOYEMENT


github.com/LucyNowacki/CancerDetector
LucyNowacki / CancerDetector
Code Issues Pull requests Actions Projects Wiki Security Insights Settings
CancerDetector Public
main 1 Branch 0 Tags
LucyNowacki Update README with dataset image
Data Initial commit 49 minutes ago
templates Initial commit 49 minutes ago
.README.md.swp Initial commit 49 minutes ago
README.md Update README with dataset image 10 minutes ago
breast_cancer.png Add breast cancer dataset image 25 minutes ago
breast_cancer.py Initial commit 49 minutes ago
fitted_scaler.joblib Initial commit 49 minutes ago
rf_model.joblib Initial commit 49 minutes ago
rf_model.py Initial commit 49 minutes ago
README
CancerDetector
Overview
CancerDetector is a Flask-based web application that uses a machine learning model to predict the presence of breast cancer in histopathological images.
127.0.0.1:5000
Breast Cancer Detector
Enter Image Index (0-1109): 979 Submit
Prediction: No Cancer
Model Details
The application employs a Random Forest classifier, which has been trained on a standardized dataset of 50x50 pixel histopathological images. Each image is labeled with one of two possible categories: Cancer or No Cancer.
Installation
To get CancerDetector up and running on your local machine, follow these instructions:
Prerequisites
Python 3.8 or higher
About
Detects breast cancer on images.
Releases
Packages
Languages
Python 67.3% HTML 32.7%
Suggested workflows
SLSA Generic generator
Pylint
Python package
Configure
More workflows
Dismiss suggestions

START APP

```
lucy@lucy-GS70-2QE: ~/Documents/Visions/Breast/Git_2
(lucy) lucy@lucy-GS70-2QE:~/Documents/Visions/Breast/Git_2$ export FLASK_APP=rf_model.py
(lucy) lucy@lucy-GS70-2QE:~/Documents/Visions/Breast/Git_2$ flask run
 * Serving Flask app 'rf_model.py'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
127.0.0.1 - - [28/Apr/2024 22:24:08] "GET / HTTP/1.1" 200 -
Selected image shape: (50, 50, 3)
Flattened image shape: (7500,)
127.0.0.1 - - [28/Apr/2024 22:24:15] "POST /predict HTTP/1.1" 200 -
```

127.0.0.1:5000

Course: School... Course(s) Słownik angiel... Dashboard

Breast Cancer Detector

Enter Image Index (0-1109): 420 Submit

Prediction: Cancer