Project Title: Spot On: Automated Detection of Skin Faults and Blemishes Using Python
Theme: Facial Blemishes Recognition and Automated Measures

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Project Description:

Spot On is an advanced image analysis tool using various Python modules that recognizes and analyzes facial features, specifically blemishes such as acne, aging lines, blackheads, or other facial marks that require attention. By utilizing open source libraries that allow the application to image analyzation such as OpenCV and TensorFlow, the application will scan real-time images/visuals to identify the addressable issues given. The application will provide specified facial issues, highlight areas, and possibly provide an extensive report regarding treatment and preventive measures.

Project Goals:

- To design a system that accurately detects facial blemishes such as acne and blackheads through image processing techniques.
- To highlight and label the type of skin blemish detected.
- To provide possible medications for treatment of the skin blemish, according to the analysis of the skin blemish.
- To recommend lifestyle habits for the prevention of the recurrence of the skin blemish.

Tentative Project Timeline

- Target start date: 4th of November, 2024
- Target completion date: 3rd of December, 2024
- Classification Model training date/s: 4th to 8th of November, 2024
- Coding of Implementation dates: 11th to 25th of November, 2024
- Product testing and debugging: 26th of November, 2024 to 2nd of December, 2024

Required Resources

- Virtual Machine / Physical computer that can run for hours, or days at the worst:
  - https://cloud.google.com/vertex-ai/docs/image-data/classification/train-model
- Python: https://www.python.org/
- OpenCV python library / API:
  - https://docs.opencv.org/4.x/d6/d00/tutorial_py_root.html
- Tensorflow python library / API:
  - https://www.tensorflow.org/api_docs/python/tf/all_symbols
- Dataset for training classification model:
  - https://www.kaggle.com/datasets/trainingdatapro/skin-defects-acne-redness-and-bags-under-the-eyes
  - https://www.kaggle.com/datasets/jessicali9530/celeba-dataset

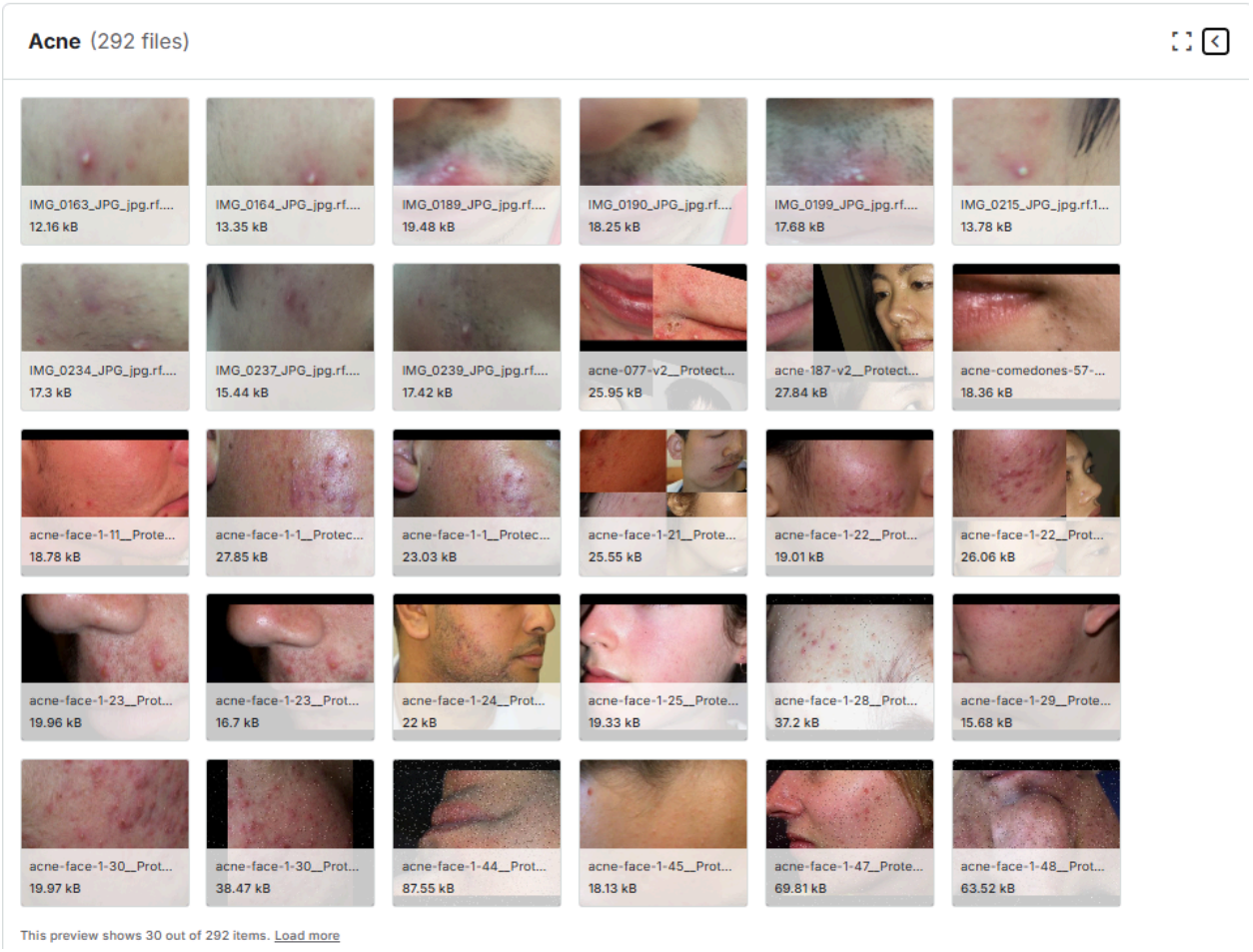
Classes to be used:

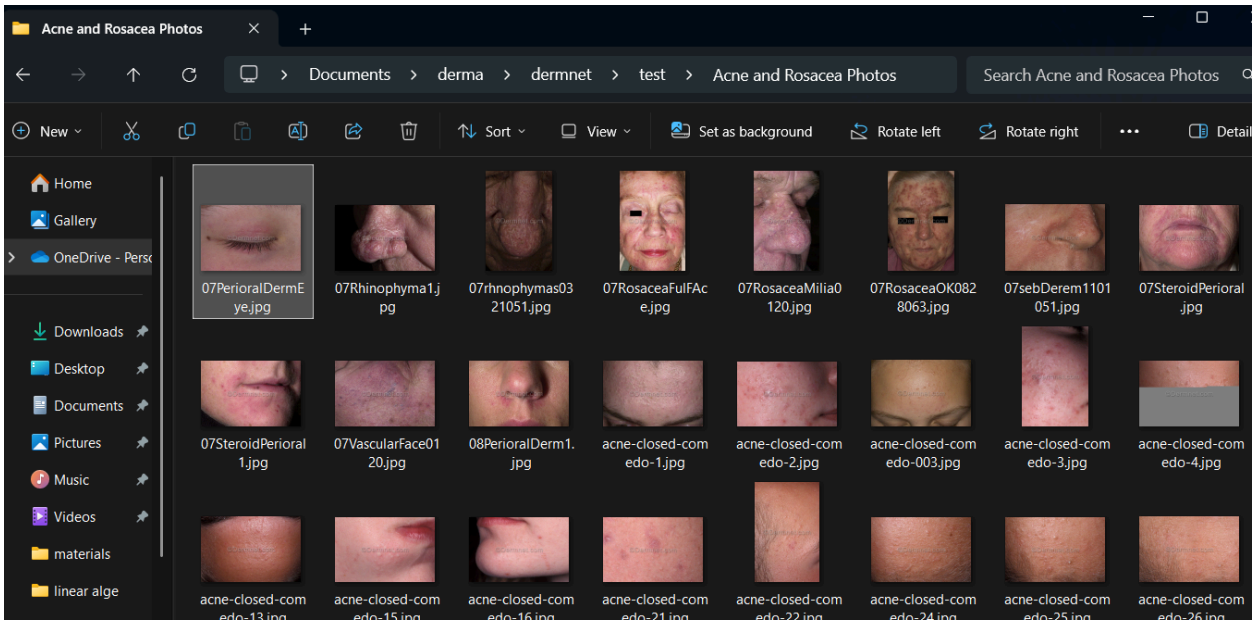
- Cystic Acne
- Perioral Dermatitis
- Rosacea
- Pustular acne
- Closed Comedone - Whiteheads
- Open Comedone - Blackheads
- Excoriated Acne (Can be combined with cystic acne)
- Acne Scar (Can be combined with cystic acne)

Rejected:

- Millia
- Minocycline Pigmentation
- Rhynophyma

Validated data:




Acne and Rosacea Photos
Documents
derma
dermnet
test
Acne and Rosacea Photos
Search Acne and Rosacea Photos
New
Sort
View
Set as background
Rotate left
Rotate right
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07Rhinophyma1.jpg
07rhnophymas0321051.jpg
07RosaceaFulFAce.jpg
07RosaceaMilia0120.jpg
07RosaceaOK0828063.jpg
07sebDerem1101051.jpg
07SteroidPerioral.jpg
07SteroidPerioral1.jpg
07VascularFace0120.jpg
08PerioralDerm1.jpg
acne-closed-comedo-1.jpg
acne-closed-comedo-2.jpg
acne-closed-comedo-003.jpg
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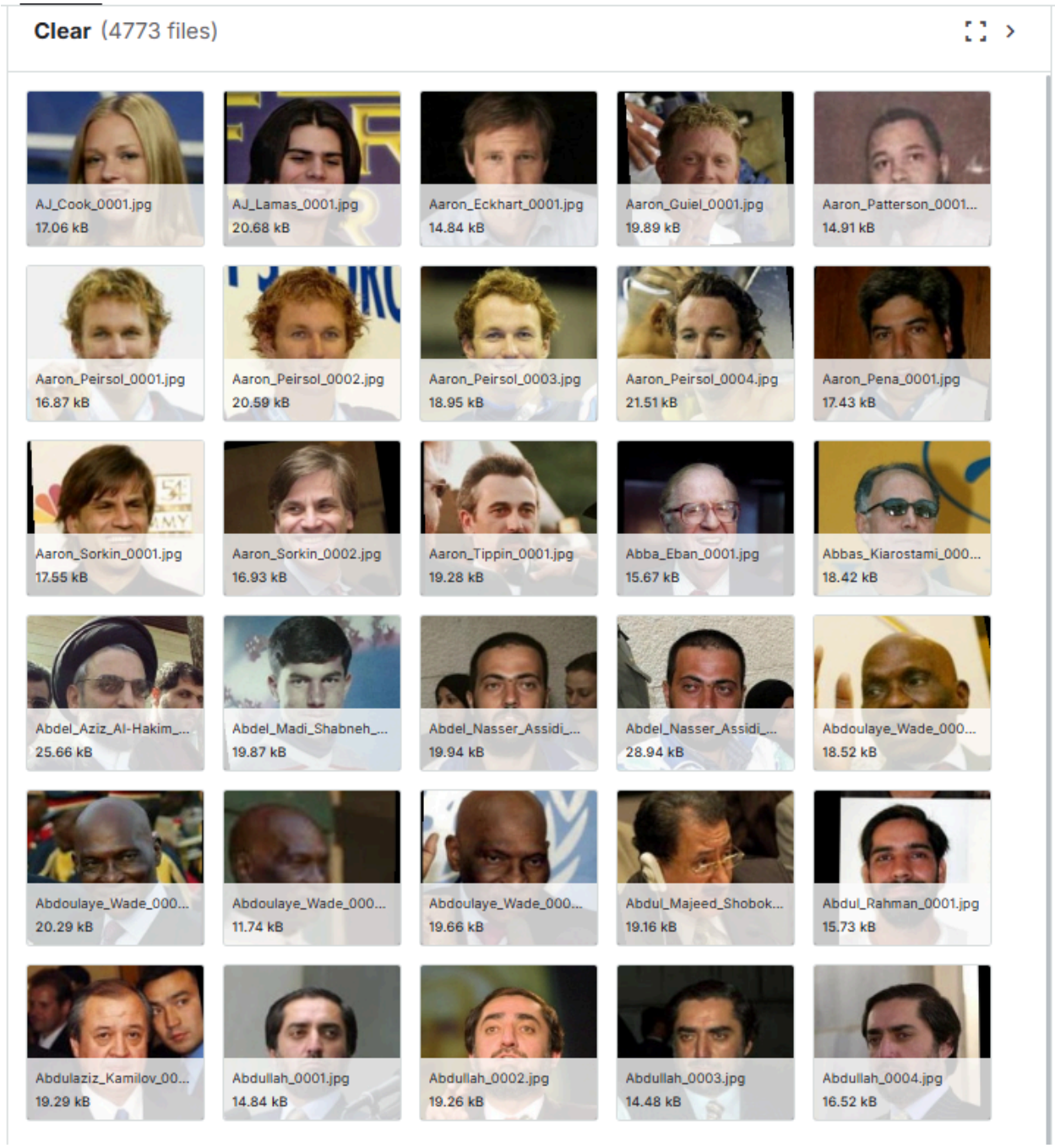
acne-closed-comedo-25.jpg
acne-closed-comedo-26.jpg

Checking of the skin disease if found on face:



Utilized datasets:

https://www.kaggle.com/code/xtvgie/acne-detection
https://www.kaggle.com/datasets/shubhamgoel27/dermnet/data