Airlock389 – Estimating Mask Size using Computer Vision

Prerequisites:

OS: Ubuntu/Debian-based
Language: Python 3.8.5
Libraries: Landmark detection: **dlib**
Object detection: **opencv**
Image processing: **imutils**
Command line parser: **argparse**
Parallel processing: **multiprocessing**

Installing libraries:

```
pip install dlib
pip install opencv-contrib-python
pip install imutils
conda install -c auto multiprocessing
```

Package manager: Anaconda 4.9.2 (testing and development)
~ Installation help: https://docs.anaconda.com/anaconda/install/linux/
~ Cheat-sheet: https://docs.conda.io/projects/conda/en/latest/user-guide/cheatsheet.html
~ Create the environment: *conda create --name airlock python=3.8.5*
~ Activate the environment: *conda activate airlock*

File structure:

airlock_model
mask_size_estimator
detect_mask_size.py
mask_size_functions.py
output
models
coin_detector.svm
landmark_predictor.dat

Usage:

Ensure your file structure contains **mask_size_estimator** and **models** in the configuration listed above

Call detect_mask_size.py
Program takes 2 arguments: *image path (indicated with -i)* and *coin (indicated with -c)*
image is the path to your target image
coin is the type of coin in the image
Options: onepeso, fivepeso, tenpeso, penny, nickel, dime, quarter
If none are selected, program defaults to fivepeso

1) Type the following: *python detect_mask_size.py -i ../path/to/images/testing.jpg -c quarter*

2) Program then passes *image* through coin detector and landmark predictor from **models** folder

3) Program calculates face size (**d**) based on **a** / (**b** / **c**) = **d**
    a is distance between nose and chin in pixels
    b is distance between top and bottom of coin in pixels
    c is the size of the coin used in mm

4) Program saves a dated copy of *image* to the *output* folder
    Format: *year_month_day_hour_minute_second*

5) Program prints estimated face size and corresponding mask size to console
    Sizing is **not yet calibrated**; results will be offset until calibration
    Currently uses a placeholder threshold of >90mm for Large/Extra Large