**Mouth Symmetry Project - Manual**

**Python prerequisites**

cv2

os

random

math

matplotlib

mediapipe

numpy

**Project file Map:**

├───mediaPipeTest

│       FaceMeshBasics.py - MediaPipe basic functions for testing

│       FaceMeshModule.py - MediaPipe Modules functions for testing

│

└───Symmetry

    │   mesh\_map.jpg-  Face map for landmark points

    │   Project.py - main project file (entry point)

    │   projectDefs.py - project definitions and settings

    │   README.md - Readme File

    │   Symmetry.py - Symmetry methods

    │   test\_image.jpg - unittest image

    │   test\_Symmetry.py - unittest methods

    │   test\_unittest.py - unittest entry

    │   utils.py - housekeeping methods

    │   work\_queue.txt- todo list and tasks

    │

    ├───.vscode

    │       launch.json - vscode settings

    │

**How to run:**

**Run unittests using:** python .\test\_unittest.py

**Run Video Symmetry using:** python .\Project.py

**Webcam based Running:** change the comment at the end of .\Project.py to support webcam analysis instead of vide folder

**Input and Output Data Folders**

1. Video’s will be loaded from the TestVideos folder placed in : \Symmetry\Data\TestVideos
2. Video images output will be placed in : \GIT\Symmetry\Data\TestImages\#VideoName

For example: \GIT\Symmetry\Data\TestImages\deflaction\_N05\_01\_MS

1. In each folder you will find image per analyzed frame including three plots of :
   1. #VideoName\_Angles – specifying the out angles of symmetry lines
   2. #VideoName\_Angles \_SD – specifying the symmetry distance in each frame
   3. #VideoName\_Angles \_SD\_Norm - specifying the symmetry distance in each frame after normalization

**Project Configuration:**

#Alg Settings

useNormalizedLandmarks = True  # Alg: work in normalized landmarks domain, or image landmark domain.

filterLandmarks        = True  # Alg: filter landmark points position between frames based on previous position

ignoreSmallMouthSize   = True  # Alg: ignore small mouth size calculation to remove jitter.

#Display Settings

normalizeOutputSD  = True        # Display: normalize SD output values for display

filterAngleOutputs = True        # Display: filter SD Angles output display

filterSDOutputs    = False       # Display: filter SD & MS for output display

createVideoOutput  = False       # Display: join all frames to output video

MIN\_MOUTH\_SIZE\_FOR\_SD\_CALC = 0.2 # prevents small point calculation jitter

# Image Const Values

IMAGE\_WIDTH = 1080

IMAGE\_HEIGHT = 1920

IMAGE\_LOAD\_SKIP\_CNT = 1

IMAGE\_WRITE\_SKIP\_CNT = 1

# Normalization Factors

SD\_MAX\_NORM\_VALUE = 100 #Max Normalization value for symmetry distance

SD\_MIN\_NORM\_VALUE = 0 #Min Normalization value for symmetry distance

MOUTH\_SIZE\_MAX\_NORM\_VALUE = 100 #Max Normalization value for Mouth Size

MOUTH\_SIZE\_MIN\_NORM\_VALUE = 0 #Min Normalization value for Mouth Size

NORM\_VAR = 10 #Variance Normalization factor

#Filter Const

SD\_FILTER\_CONST = 0.5 # IIR Filter Const for Symmetry distance

LANDMARK\_FILTER\_CONST = 0.5 # IIR landmark filter const between frames