**Openface outputs relevant for the deep-virtual-rapport-agent project**

* facial landmark detection,
* head pose estimation,
  + <https://github.com/TadasBaltrusaitis/OpenFace/wiki/API-calls>
  + (X, Y, Z, rot\_x, roty\_y, rot\_z)
* facial action unit recognition,
  + <https://github.com/TadasBaltrusaitis/OpenFace/wiki/Action-Units>
  + OpenFace is able to recognize a subset of AUs, specifically:
  + 1, 2, 4, 5, 6, 7, 9, 10, 12, 14, 15, 17, 20, 23, 25, 26, 28, and 45. **(18 AUs)**
  + Presence 0/1 and intensity (continuous scale 0, 1-5) => may not be consistent
  + AU prediction on individual images is not as high as that of AU prediction on **videos** because videos allow for person specific calibration  
    => do on videos and mention this reasoning in paper
  + Use **FeatureExtraction** project
  + static / dynamic model
    - Dynamic = automatic for videos / image sequences;  
      calibrates to a person by performing person normalization;  
      also attempts to correct for over and under prediction of AUs
    - If video sequences do not have much dynamic range - the same expression is held throughout the video, this means that post calibration will not be helpful and might in fact be harmful, for those video sequences I recommend using -au\_static flag
    - Use dynamic if enough video data is available for a person (roughly more than 300 frames that contain a number of non-expressive/neutral frames).
* eye-gaze estimation
  + Requires facial landmarks detected using a LandmarkDetector::CLNF model
  + Can use <https://github.com/pashpashpash/Eye-Contact-Detection-With-OpenFace>
* Facial Feature Extraction (aligned faces and HOG features)
* available source code for both running and training the models
* **FeatureExtraction = OpenFaceOffline**
  + landmarks, AUs, head pose, gaze, similarity normalised faces and HOG features
  + -f video
  + -fdir img\_seq\_dir
  + -pose (pose only)
  + See [https://github.com/TadasBaltrusaitis/OpenFace/wiki/Command-line-arguments#featureextraction-and-facelandmarkvidmulti](https://github.com/TadasBaltrusaitis/OpenFace/wiki/Command-line-arguments" \l "featureextraction-and-facelandmarkvidmulti)
* Output: <https://github.com/TadasBaltrusaitis/OpenFace/wiki/Output-Format>