



## AffectNet Database

**AffectNet** contains about 1M facial images collected from the Internet by querying three major search engines using 1250 emotion related keywords in six different languages. About half of the retrieved images (~**420K**) are manually annotated for the presence of seven discrete facial expressions (categorical model) and the intensity of valence and arousal (dimensional model). **The rest of the images (~550K) are automatically annotated using ResNext Neural Network trained on all manually annotated training set samples with average accuracy of 65%.** **AffectNet** is by far the largest existing database of facial expressions, valence, and arousal in the wild enabling research in automated facial expression recognition in two different emotion models.

AffectNet provides:

- Images of the faces
- Location of the faces in the images
- Location of the 68 facial landmarks
- Eleven emotion and non-emotion categorical labels (Neutral, Happiness, Sadness, Surprise, Fear, Disgust, Anger, Contempt, None, Uncertain, No-Face)
- Valence and arousal values of the facial expressions in continuous domain

**We refer readers to our paper for details about the data collection, annotation, and model training.**

### Emotion categories:

Eleven annotated emotions are provided for images and indexed as follows:  
0: Neutral, 1: Happiness, 2: Sadness, 3: Surprise, 4: Fear, 5: Disgust, 6: Anger, 7: Contempt, 8: None, 9: Uncertain, 10: No-Face

Number of manually annotated images in the training and validation set is shown in Table below:

Neutral	75,374
Happy	134,915
Sad	25,959
Surprise	14,590
Fear	6,878
Disgust	4,303
Anger	25,382
Contempt	4,250
None	33,588
Uncertain	12,145
Non-Face	82,915
Total	420,299

### **Valence & Arousal:**

Valence and arousal values are provided as floating point numbers in the interval  $[-1,+1]$ .

### **Images:**

Provided images are result of 15% boundary expansion of OpenCV face detector.

### **How to download the database:**

**Since the full AffectNet database is huge (122GB) and require super reliable and fast internet to download and store it, we release two versions of the database:**

**AffectNet with eight (8) labels: A small version (291,651 Images) that only contains the manually annotated images with 8 labels (0-7 as explained above) is being released since March 2021. The images are cropped and resized to 224 x 224 pixels (RGB color). The 8 expression labels and the Arosal/Valence values as well as the facial landmark points of the training and validation**

sets are in the database. This version of AffectNet can be downloaded from [here](#); It is about 4GB and there are two tar archive files that need to be downloaded (train\_set.tar and val\_set.tar); After extract the tar files, you will find the images and corresponding labels are stored in “images” and “annotations” folders.

If you need the full AffectNet database, please contact [mohammad.mahoor@du.edu](mailto:mohammad.mahoor@du.edu) and make a specific request. Note that size of the full database is about 122GB. It may take 1 or 2 days to download the entire database depending on your internet speed.

**The Test set is not released at this moment. We are hoping to organize a challenge on AffectNet in near future. Test set will be used to evaluate the participants.**

The following tables give the results of our experiments on the validation set using our baseline methods (described in our paper) trained on the training set. We suggest researchers use the validation results as a baseline for comparison until the test set is released.

Categorical model:

	Down-Sampling	Up-Sampling	Weighted-Loss
ACCs	0.50	0.47	0.58
F1s	0.49	0.44	0.58
KAPPAs	0.42	0.38	0.51
ALPHAs	0.42	0.37	0.51
AUCPR	0.48	0.44	0.56
AUC	0.47	0.75	0.82

Dimensional model:

	Valence	Arousal
RMSE	0.37	0.41
CORR	0.66	0.54

SAGR	0.74	0.65
CCC	0.60	0.34

### Some Notes:

- The x and y coordination and the annotations are stored in .npy files. Use Python numpy to read the files separated with a semi-colon.
- Expression: expression ID of the face (0: Neutral, 1: Happy, 2: Sad, 3: Surprise, 4: Fear, 5: Disgust, 6: Anger, 7: Contempt)
- Valence: valence value of the expression in interval [-1,+1] (for Uncertain and No-face categories the value is -2)
- Arousal: arousal value of the expression in interval [-1,+1] (for Uncertain and No-face categories the value is -2)

**All papers that either uses AffectNet fully or partially or is based on the analysis / study of AffectNet database MUST cite the following paper:**

### Citation:

A. Mollahosseini; B. Hasani; M. H. Mahoor, "AffectNet: A Database for Facial Expression, Valence, and Arousal Computing in the Wild," in *IEEE Transactions on Affective Computing*, 2017.

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The paper is in Arxiv: <https://arxiv.org/abs/1708.03985>