

Facial Micro-Expression (FME) Challenge 2021 - Generation task Guidelines

The goal of this challenge is to generate micro-expression on the given template faces. For this challenge, we focus on three commonly used micro-expression databases: the Chinese Academy of Sciences Micro-Expression Database II (CASME II) with 247 FMEs at 200 fps, SMIC-E with 157 FMEs at 100 fps and Spontaneous Facial Micro-Movement Dataset (SAMM) with 159 FMEs at 200 fps. By evaluating the authenticity and strength of the generated micro-expression via psychologists' inspection, reliable micro-expression generation can enable proper data augmentation of FMEs, thereby promoting the further development of micro-expression analysis. The details of the databases as follow:

1 CASME II [4] generation task

CASME II contains 26 subjects and 255 ME sequences. All videos are at 200 fps to retain more facial information and the resolution is 640×480 . The onset, apex, offset index for these expressions are given in the excel file. In addition, the eye blinks are labeled with onset and offset time. To download the dataset, please visit:

<http://fu.psych.ac.cn/CASME/casme2-en.php>

Download and fill in the license agreement form, upload the file through this link: <https://www.wjx.top/vj/r4hjmch.aspx>.

2 SAMM[1] generation task

The original SAMM dataset [1] with 159 micro-expressions. In SAMM Long Videos dataset [6], there are 147 videos. The index of onset, apex and offset frames of micro-movements are outlined in the ground truth excel file. The micro-movements interval is from onset frame to offset frame. In this database, all the micro-movements are labeled. Thus, the spotted frames can indicate not only micro-expression but also other facial movements, such as eye blinks. To download the dataset, please visit:

<http://www2.docm.mmu.ac.uk/STAFF/M.Yap/dataset.php>

Download and fill in the license agreement form, email to M.Yap@mmu.ac.uk with email subject: SAMM.

3 SMIC[3] generation task

SMIC [3] includes three subsets: SMIC-HS, SMIC-VIS and SMIC-NIR. SMIC-VIS and SMIC-NIR contains 71 samples recorded by normal speed cameras with 25 fps of visual (VIS) and near infrared (NIR) light range, respectively. SMIC-HS recorded by 100 fps high-speed cameras contains 164 spontaneous micro-expression clips from 16 subjects. These micro-expression clips are divided into three classes: positive, negative, and surprise. To download the dataset, please visit:

<https://www oulu fi/cmvs/node/41319>

Download and fill in the license agreement form, email to Xiaobai.Li@oulu.fi.

References

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- [3] Xiaobai Li, Tomas Pfister, Xiaohua Huang, Guoying Zhao, and Matti Pietikäinen. A spontaneous micro-expression database: Inducement, collection and baseline. In *2013 10th IEEE International Conference and Workshops on Automatic face and gesture recognition (FG)*, pages 1–6. IEEE, 2013.
- [4] Wen-Jing Yan, Xiaobai Li, Su-Jing Wang, Guoying Zhao, Yong-Jin Liu, Yu-Hsin Chen, and Xiaolan Fu. Casme ii: An improved spontaneous micro-expression database and the baseline evaluation. *PloS one*, 9(1):e86041, 2014.
- [5] Wen-Jing Yan, Qi Wu, Yong-Jin Liu, Su-Jing Wang, and Xiaolan Fu. *CASME database: a dataset of spontaneous micro-expressions collected from neutralized faces*, page 1–7. IEEE, 2013.
- [6] Chuin Hong Yap, Connah Kendrick, and Moi Hoon Yap. Samm long videos: A spontaneous facial micro-and macro-expressions dataset. In *2020 15th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2020)*, pages 771–776. IEEE, 2020.

Result Evaluation Standard

3.1 Submission Video Format

Each database specifies three kinds of emotion samples (positive, negative, and surprised), i.e. source samples, as listed in Table 3.1.

Table 1: Sequence names of the assigned emotion samples for the generation task (Source).

Databases	CASME II	SAMM	SMIC-HS
Positive	EP01_01f	022_3_3	s3_po_05
Negative	EP19_06f	018_3_1	s11_ne_02
Surprise	EP01_13	007_7_1	s20_sur_01

The participants should generate the specified expressions on the two provided template faces, which are Asian female (from CASME I [5]) and western male (from SMIC-VIS) respectively (as shown in Fig. 1), i.e. target samples.

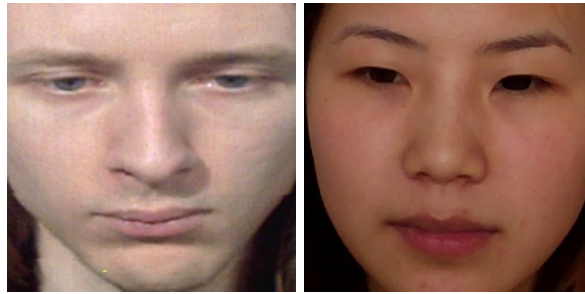


Figure 1: Normalized template faces for generation (Target).

The expected output video should generated the facial micro expression from source samples videos on the target face, as illustrated in Fig. 2.

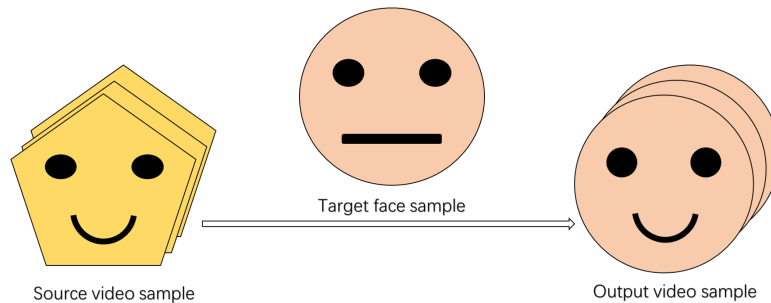


Figure 2: An example of generation task output video.

The total number of videos for submission is 18, i.e. 2 templates \times 3 emotions for each database. All submitted videos should be unified at 100fps, with a resolution of 256×256 . The length of the generated video is based on the specified emotion sample and does not need to be normalized.

3.2 Evaluation Protocol

Each generated image will be evaluated based on the quality and action units. Specifically, the facial region will be divided into upper and lower parts (see Fig. 3) and evaluated separately. By separating the face into two parts, evaluations can take into account partial facial movements that may occur.

The quality and action unit of each block will be scored 0-3 by experts who have Facial Action Coding System (FACS) certification [2]. The following details the score categories:

- Score 0: Completely incorrect
- Score 1: Poor
- Score 2: Good
- Score 3: Excellent

In addition, there will be a 'noise' category, which judges the overall generation's image quality and is also score 0-3. For example, if a generation has background artifacts, this would reduce the noise score.

The maximum available score will be 9. Three experts will evaluate the generated images individually and the final score will be the average of scores provided by three experts.



Figure 3: A basic representation of the upper and lower face used for assessment.

Baseline Method and Result

As the submission results will be evaluated by three experts, there are no baseline method and result for the generation task.

Submission

For the purpose of result verification and to encourage reproducibility and transparency, all entries must submit the following:

- A paper highlighting the contribution of the submission, but not limited to, the method, experimental results and analysis, prepared according to the format stipulated by ACM Multimedia. For detailed instructions on this, please refer to [here](#). All challenge entries should be accompanied by a paper submission.
- GitHub repository URL containing codes of your implemented method, and all other relevant files such as feature/parameter data. To help publicize our workshop and domain area, please do mention (or add relevant links on) FME Challenge 2021 and ACM Multimedia 2021. You may provide this URL in a simple text file while submitting.

For all files except for the paper, please submit in a single zip file and upload to the submission system as supplementary material.

The submission portal will be open at [FME challenge 2021 Website](#)

Deadline of Challenge: **11 July 2021, 2359 PST (UTC -8)**

Rules

The organizers reserve the right to disqualify submissions with on the basis of

- Challenge results that are likely to be suspicious, i.e. out-of-norm from the distribution of scores from submitters.
- Non-submission of accompanying paper.
- Submission of an accompanying paper that has a substantial overlap with any other paper already submitted or published, or to be submitted during the review period

For further enquiries, please contact:

Jingting Li (lijt@psych.ac.cn) - General enquiries about the challenge

Su-Jing Wang (wangsujing@psych.ac.cn) - CAS(ME)²

Moi Hoon Yap (m.yap@mmu.ac.uk) - SAMM dataset

Xiaobai Li (Xiaobai.Li@oulu.fi) - SMIC dataset