Reclassification of CK+ Dataset for Training CNNs

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There are 593 sequences of images captured from videos across 123 subjects and 8 emotion labels in the dataset (neutral + 6 basic emotions + contempt). But only 5.5% of sequences with emotion labels are contempt, and it is not considered as a universal emotion. So contempt is ignored in the reclassification.

There are two reasons for reclassification.
1. If only the first frame of the sequence is classified to neutral, and peak frame (last frame) is classified to one of the six basic emotions, the quantity of images for training CNNs is not enough. There are only 309 images are labeled as one of six emotions.

2. The images distribution among seven emotions is not balanced. As shown in the table, there are very few images in fear and sadness class.

Neutral	Anger	Disgust	Fear	Happy	Sadness	Surprise
327	45	59	25	69	28	83

Some measures were used to eliminate these disadvantages.
As to emotions with lower rate such as fear and sadness, most of the frames with obvious emotions in the second half of sequences were classified to the corresponding class. Whereas only 5% to 25% frames in the second half of sequences of emotions with the higher rate are classified.

Besides, for increasing variance of the images in each class, the sampling interval is used to extract images from the sequences.

As a result, the quantity of images in each class is increased, and the variance of images from the same sequence is also considered. The new distribution of images among seven classes is shown below.

Neutral	Anger	Disgust	Fear	Happy	Sadness	Surprise
306	223	221	250	238	228	276