Much research has been completed in regard to accomplishing facial expression recognition with different neural network models and facial expression datasets. There are a number of different datasets that are typically used for facial expression recognition research, including the *Japanese Female Facial Expression*(JAFFE) dataset, the *Extended Cohn-Kanade*(CK+) dataset, and the *FER-2013* dataset. The JAFFE dataset was created to test models used for facial expression recognition against human perception. JAFFE contains 213 images of *seven* basic facial expressions(happiness, surprise, sadness, anger, disgust, fear, neutral) posed by *ten* different Japanese female models. The CK+ dataset was created by Lucey et al. [3] and consists of 593 video sequences, each of which contains a facial shift from a neutral expression to either happiness, sadness, surprise, anger, contempt, disgust, or fear. Additionally, it was created from 123 different subjects consisting of a variety of age ranges, genders, and heritages. As described in [1], FER-2013 was created by Carrier and Courville as part of a contest to create a new system for facial expression recognition that included the creation of an entirely new dataset. FER-2013 consists of $35,887$ grayscale images in total, $28,709$ of which are intended for training while the other $7,178$ are intended to be used for testing.

The present difficulty in implementing SNNs via software makes it more desireable to train a CNN then use the weights and activations to convert the CNN to a SNN. After conversion, SNNs are more readily deployable in real world systems due to the ability to reduce computational overhead. In terms of neural network models, Mollahosseini et al. [6] created a Deep Neural Network(DNN) architecture for facial expression recognition that consisted of *two* convolutional layers and *two* max-pooling layers followed by *four* Inception [5] layers, a component inspired by GoogLeNet. Fathallah et al. [7] proposed a CNN architecture, based on the *Visual Geometry Group*(VGG) model [4], that consisted of *four* convolutional layers and *three* max-pooling layers that were followed by a fully-connected layer and a softmax output layer. Furthermore, Kandeel et al. [8] proposed an architecture for facial expression recognition consisting of *three* convolutional layers and *three* max-pooling layers followed by *two* fully-connected layers and a softmax output layer for classification of the expression classes. In an attempt to develop new techniques for facial expression recognition, Mansouri-Benssassi and Ye [9] proposed a bio-inspired spiking neural network model, which had not been explored previously. Their model consisted of an input layer with $10,000$ neurons, a convolutional layer with 50 features, a stride size of 15, and a convolution size of 15, an excitatory layer, and a single inhibitory layer. They also included an image preprocessinglayer where a *Laplacian of Gaussian* filter is applied to the image for edge detection, and then spike trains are created using a Poisson distribution.

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