Emotion Classification for SEP CV&DL

Tanja Jaschkowitz* Leah Kawka* Mahdi Mohammadi* Jiawen Wang*
{Tanja.Jaschkowitz,Leah.Kawka,Mahdi.Mohammadi,Jiawen.Wang}@campus.lmu.de

1. Introduction

Figure 1 depicts an overview of our time schedule for the final project.

The structure of this report is arranged as follows. Section 2 provides the datasets we used, the model architecture, and preliminary evaluation results of our model.

1.1. Author Contributions

Equal contributions listed by alphabetical order of surnames. Every author did the literature research and contributed to the writing of the paper.

- **Tanja Jaschkowitz**
- **Leah Kawka** collected the training data, prepared dataprocessing, implemented augmentation, Explainable AI & Video-green square
- **Mahdi Mohammadi**
- **Jiawen Wang** implemented the model architecture, training infrastructure, and optimization strategies. In the specific wrting part, she also checked and aggereated based from other team members.

2. Approach

2.1. Dataset

Firstly, for all the image data from the training dataset [1, 2], we filter out neutral instances from the original dataset, the emotion labels are denoted as 1 (Surprised), 2 (Fearful), 3 (Disgusted), 4 (Happy), 5 (Sad), and 6 (Angry) for simplicity. Afterward, we transform and resize the images to `(64,64)`.

2.2. Model Architecture

We implemented an emotion-classification model with 3 convolution layers.

We add a `dropout` layer to prevent overfitting. In order to find the best hyperparameter configuration (see Tab. 1 for details) of the model, we utilize the parameter grid from sklearn [1].

[1] https://scikit-learn.org/stable/modules/generated/sklearn.model_selection.ParameterGrid.html

Hyperparameter	Configuration
Learning rate	{0.1, 0.01, 0.001, 0.0001}
Batch size	{8, 16, 32, 64}
Dropout rate	{0.5}
Epoch	{20}
Early stopping	{`True`, `False`}
Patience	{5}

Table 1. Explored hyperparameter space for our model

2.3. Preliminary Results

For evaluation, we use the metric accuracy.

Acknowledgements

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References

[1] Shan Li and Weihong Deng. Reliable crowdsourcing and deep locality-preserving learning for unconstrained facial expression recognition. *IEEE Transactions on Image Processing*, 28 (1):356–370, 2019. 1

[2] Shan Li, Weihong Deng, and JunPing Du. Reliable crowdsourcing and deep locality-preserving learning for expression recognition in the wild. In *2017 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 2584–2593. IEEE, 2017. 1

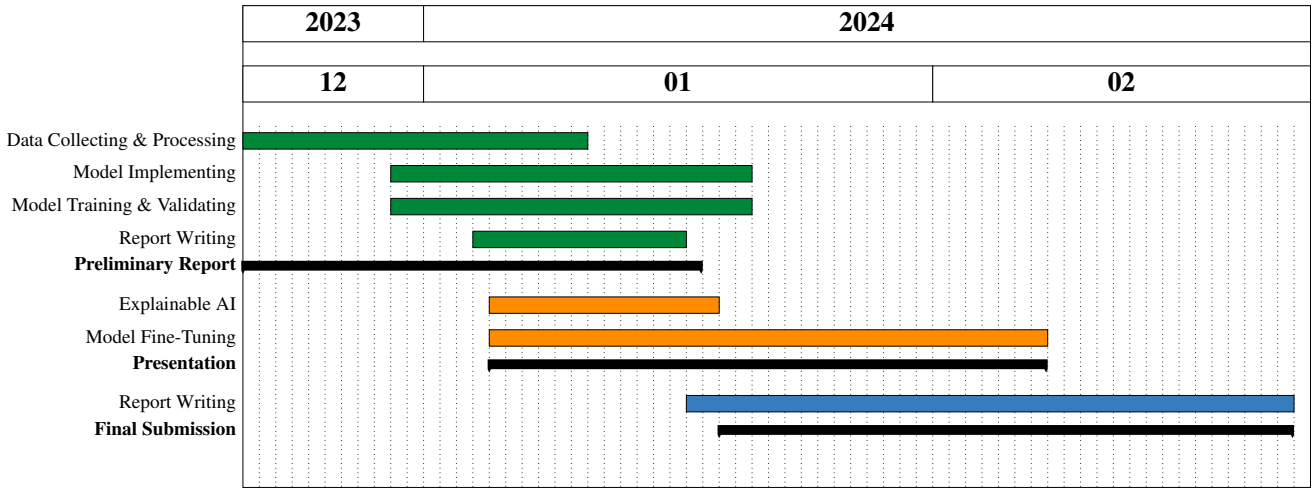

Figure 1. Overview of the time schedule for the final project

Figure 2. Empirical results in terms of the loss and accuracy on differen training epochs