DLCV Fall 2022 Final Project ／From Group 25

Liu Hsin Ping
R09946030

Bo-Yu Chen
R10944032

Tun-Min Hung

Hsiao-Tzu Hung
R08922A20

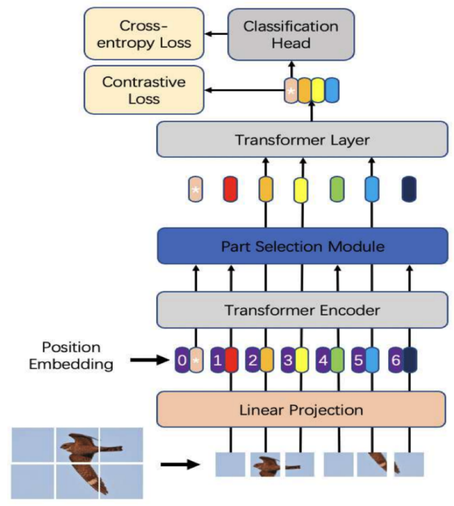
Motivation

- **Long-tailed distribution** dataset leads to biased model performance on different tasks (comm, freq, rare), we aim to teach the models how to predict the frequency of an input image.
- Facing **fine-grained image** classification task, we aim to use external information, i.e., text of the labels, for guiding our models.

Baseline Approach

TransFG

- Choose tokens with maximum attention for each head in the second last layer.

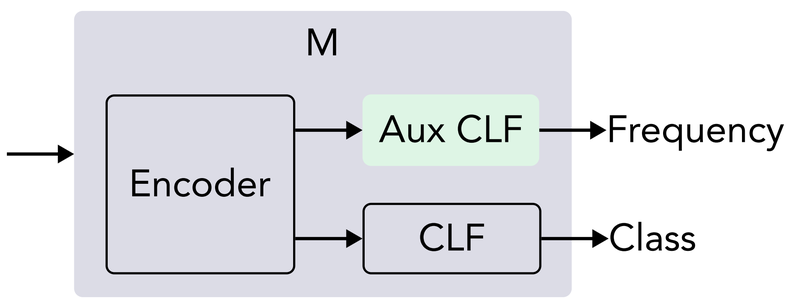


Methods

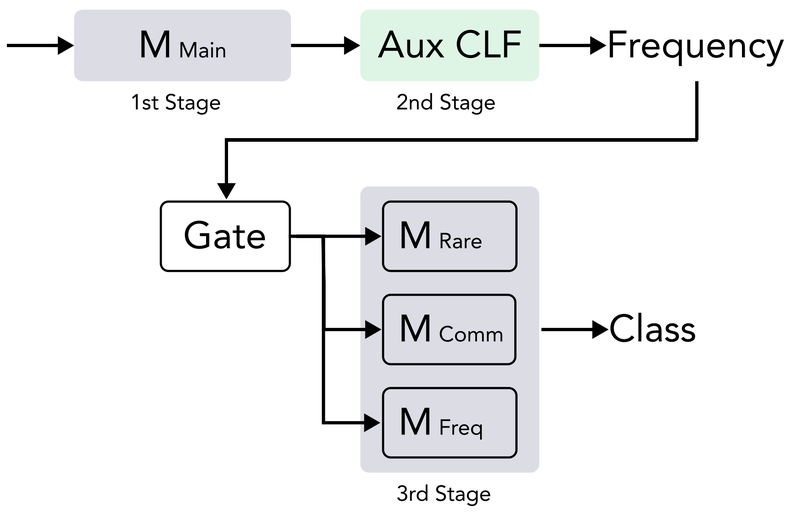
Auxiliary Classifier

Problem: Long-tailed

- **Auxiliary classifier** in multi-task fashion



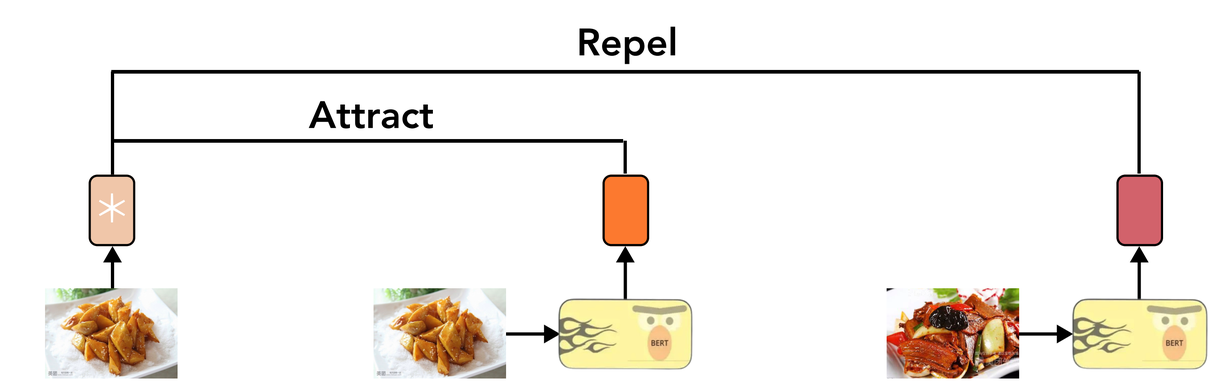
- **Auxiliary classifier** as task separator



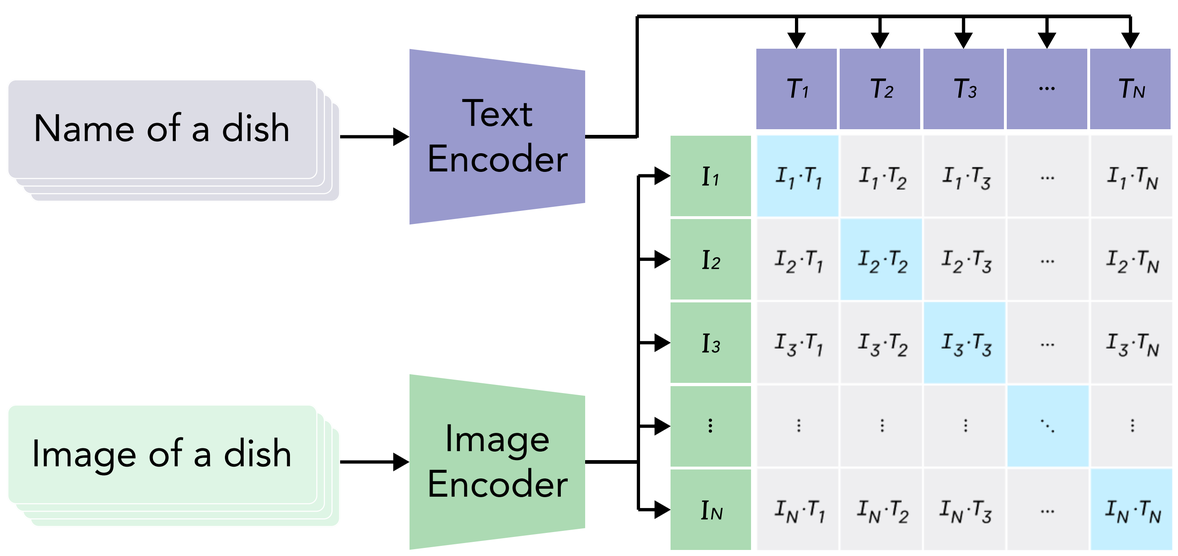
Multi-Modality

Problem: Fine-grained

- LM embedding as cls token + contrastive learning



- CLIP-zero shot vs fine-tune on CLIP



Results

Method	Freq.	Comm.	Rare	Main
Baseline	0.894	0.715	0.284	0.730
Aux CLF ／Multi-Task				
Aux CLF ／4-Stage				
Multi-Model ／BERT				
Multi-Model ／CLIP				

Conclusion

- We propose four methods, two of which based on auxiliary classifiers and the other two are multi-modality based.
- The approaches with auxiliary classifiers aim at the long-tailed distribution problem while the multi-modal approaches aim at the fine-grained classification problem.
- gives the best performance overall with the highest accuracy on track.