



Week 9

1. This week the main work is to solve the code programming of MOEA.
2. Then I read two papers about hypernetworks, [1] and [2]

[1] "YOU ONLY TRAIN ONCE: LOSS-CONDITIONAL TRAINING OF DEEP NETWORKS"

Problem: There is a model redundancy of training multiple models corresponding to different loss variants.

Main idea: When training a network, they tried to get the distribution of each weights. They are inspired by the work of "Variational image compression with a scale hyperprior" [2].

Method: Traditional old method is to train many times with different parameter settings and finally select a best one. The disadvantage of weighted method: the weights strongly affect the trade-off between the loss, unpredictable. So the author proposed a new method to solve an optimization problem where the parameters are sampled from a distribution P_λ .

Related Knowledge: Feature-wise Linear Modulation (FiLM) (Perez et al., 2018) β -variational autoencoder (Higgins et al., 2017)

Result: The author demonstrated the successful application of the method on three applications: β -VAE, learned image compression, and fast style transfer. After only one training, they got results closely resembling those of the corresponding independently trained model.

References

- [1] Josip Djolonga Alexey Dosovitskiy. You only train once: Loss-conditional training of deep networks. *arXiv preprint*, 2019.
- [2] Johannes Ballé, David Minnen, Saurabh Singh, Sung Jin Hwang, and Nick Johnston. Variational image compression with a scale hyperprior. *arXiv preprint arXiv:1802.01436*, 2018.