计算图和反向传递和雅各布矩阵：<https://blog.csdn.net/qq_29573053/article/details/79799927>

<https://blog.csdn.net/hohaizx/article/details/82313143?utm_medium=distribute.pc_relevant.none-task-blog-OPENSEARCH-1.channel_param&depth_1-utm_source=distribute.pc_relevant.none-task-blog-OPENSEARCH-1.channel_param>

<https://blog.csdn.net/zxl55/article/details/83537144?utm_medium=distribute.pc_relevant_t0.none-task-blog-BlogCommendFromMachineLearnPai2-1.channel_param&depth_1-utm_source=distribute.pc_relevant_t0.none-task-blog-BlogCommendFromMachineLearnPai2-1.channel_param>

梯度下降方向和步长：

https://www.jianshu.com/p/730982caaf4e

梯度下降收敛性：

<https://blog.csdn.net/shenxiaolu1984/article/details/52577996>

code:

keras分类问题demo: <https://colab.research.google.com/drive/1t2OeBGcfB5HSDFl6FPQFaQKbmeEAPPgG?usp=sharing#scrollTo=fM6s2qxkNnvp>

tensorflow 文档：

<https://www.tensorflow.org/api_docs/python/tf/keras/losses/categorical_crossentropy>

多分类问题例子：

<https://cnbeining.github.io/deep-learning-with-python-cn/3-multi-layer-perceptrons/ch10-project-multiclass-classification-of-flower-species.html>

优化器用法：

https://keras.io/zh/optimizers/

多分类问题用softmax， 记得要处理label成one-hot形式再训练模型

<https://blog.csdn.net/marsjhao/article/details/68086225>

y\_train = np\_utils.to\_categorical(y\_train, num\_classes=10)

y\_test = np\_utils.to\_categorical(y\_test, num\_classes=10)