深度学习基础课程
Deep Learning Foundation Course

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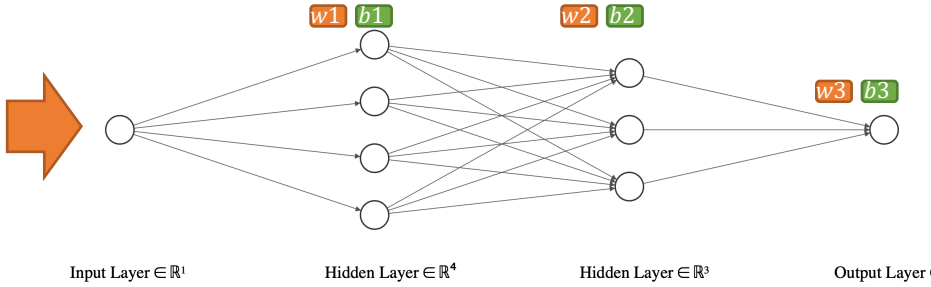
训练神经网络： optimizer 优化器

Loss function 损失函数

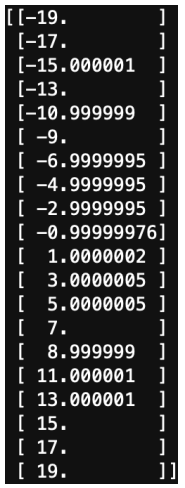
optimizer 优化器

```
model.compile(loss=tf.keras.losses.MeanSquaredError(), optimizer=tf.keras.optimizers.Adam(0.1))
history = model.fit(X, Y, epochs=500, verbose=False)
```

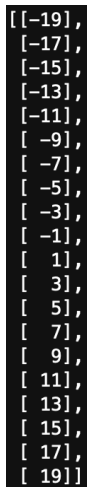
训练神经网络： optimizer 优化器



预测值



真实目标值



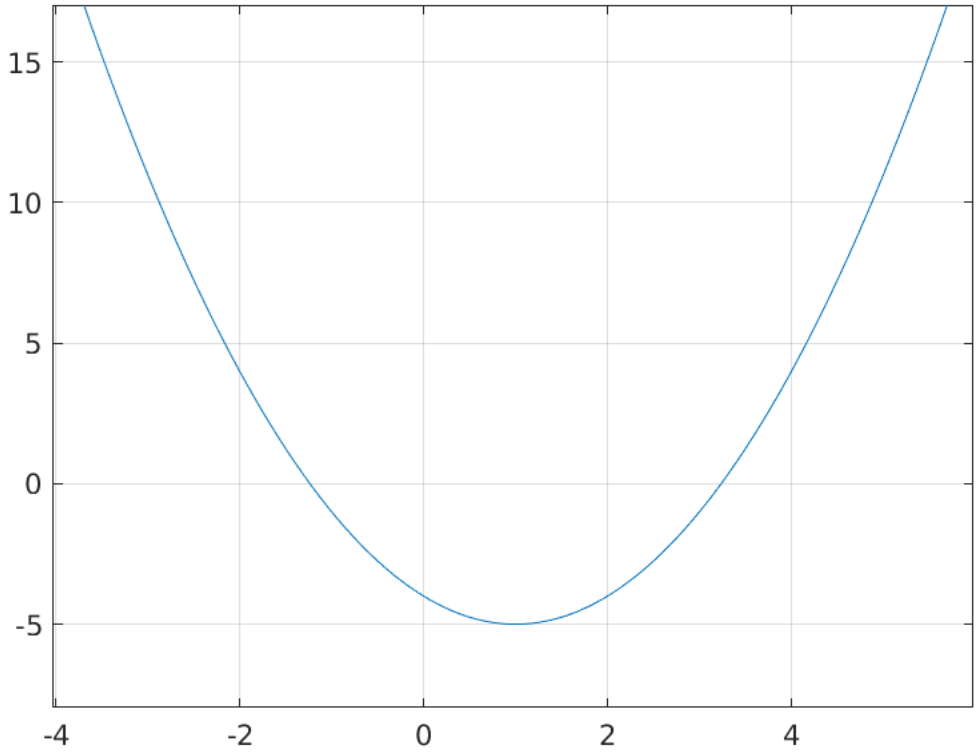
loss function
损失函数

损失值

Optimizer优化器

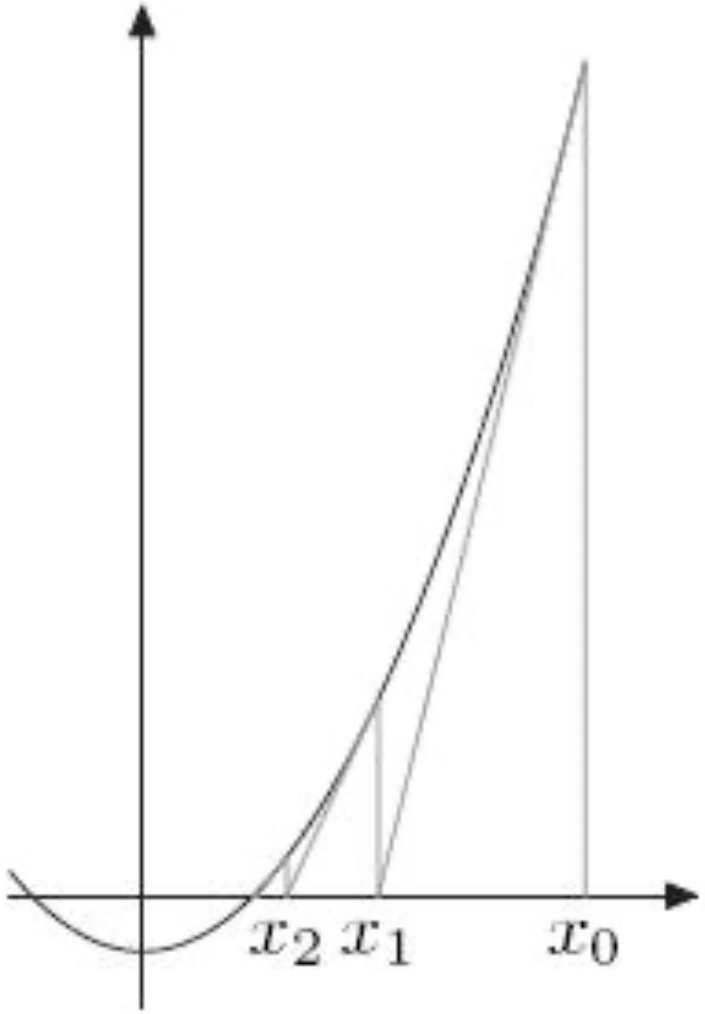
weights *bias*
权重 偏置

牛顿法-迭代法



$f(x) = x^2 - 2x - 4$

$f(x) = 0$



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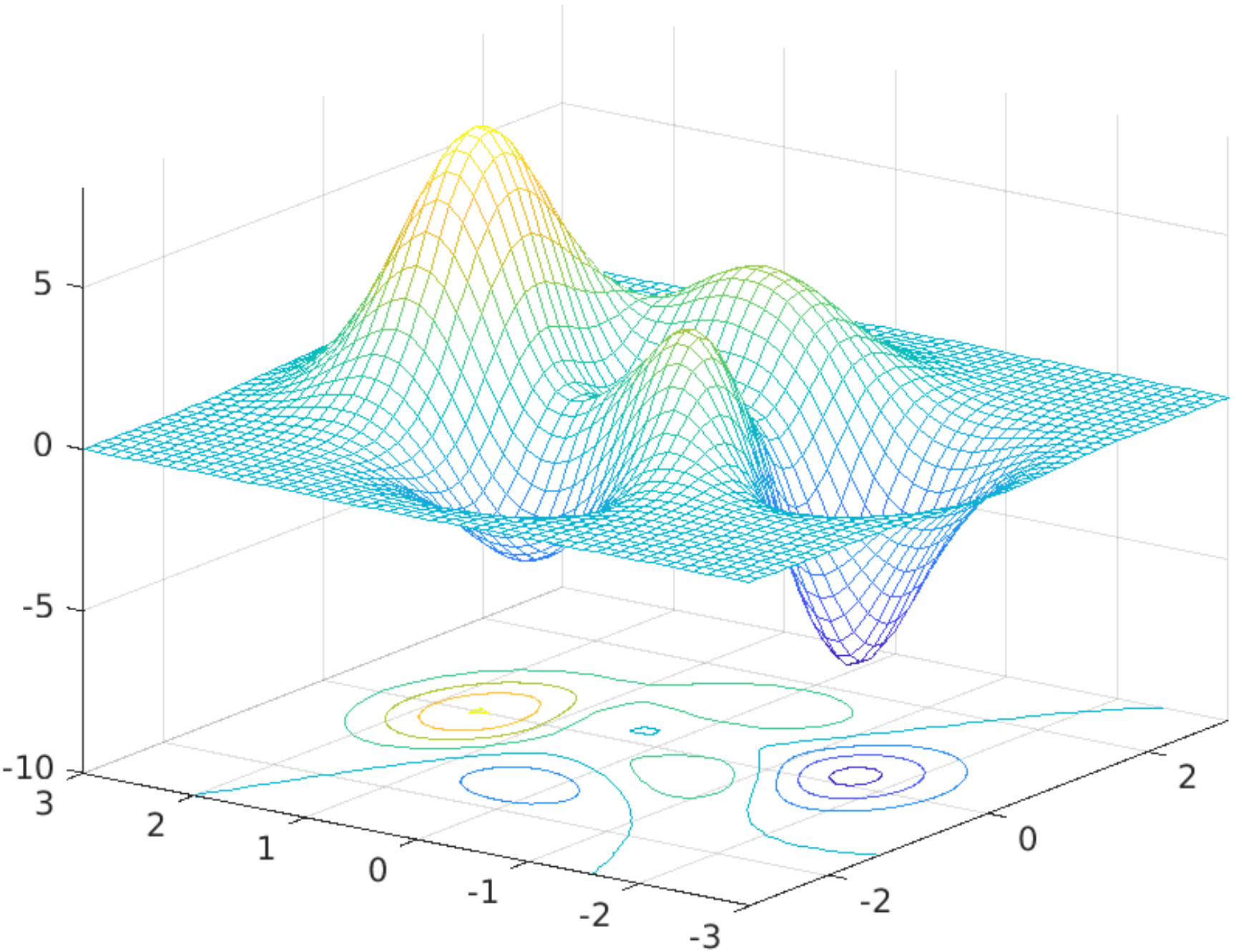


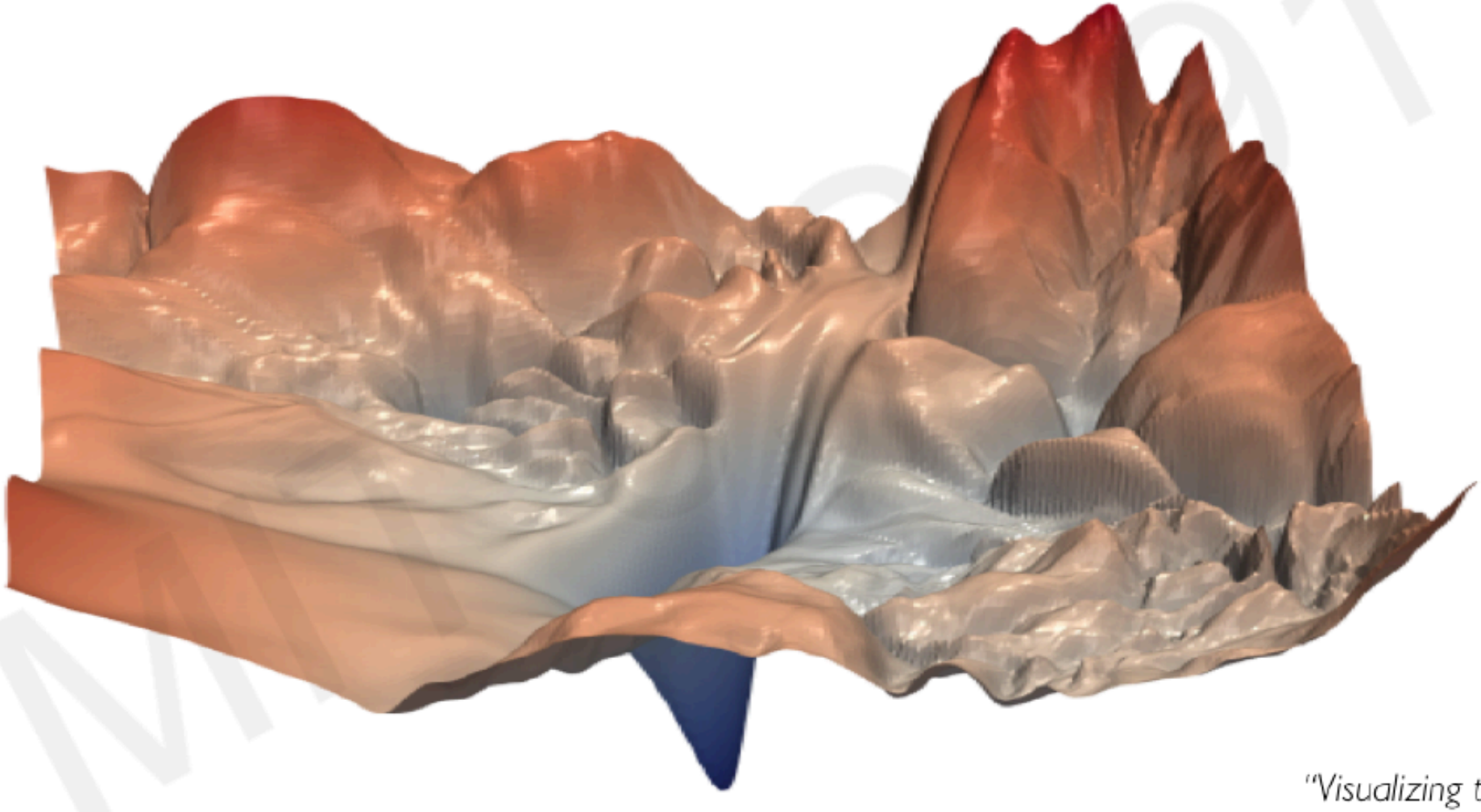
梯度下降算法

二元高斯分布的概率密度函数
matlab中的peaks函数

```
[X,Y] = meshgrid(-3:.125:3);
Z = peaks(X,Y);
meshc(X,Y,Z)
```

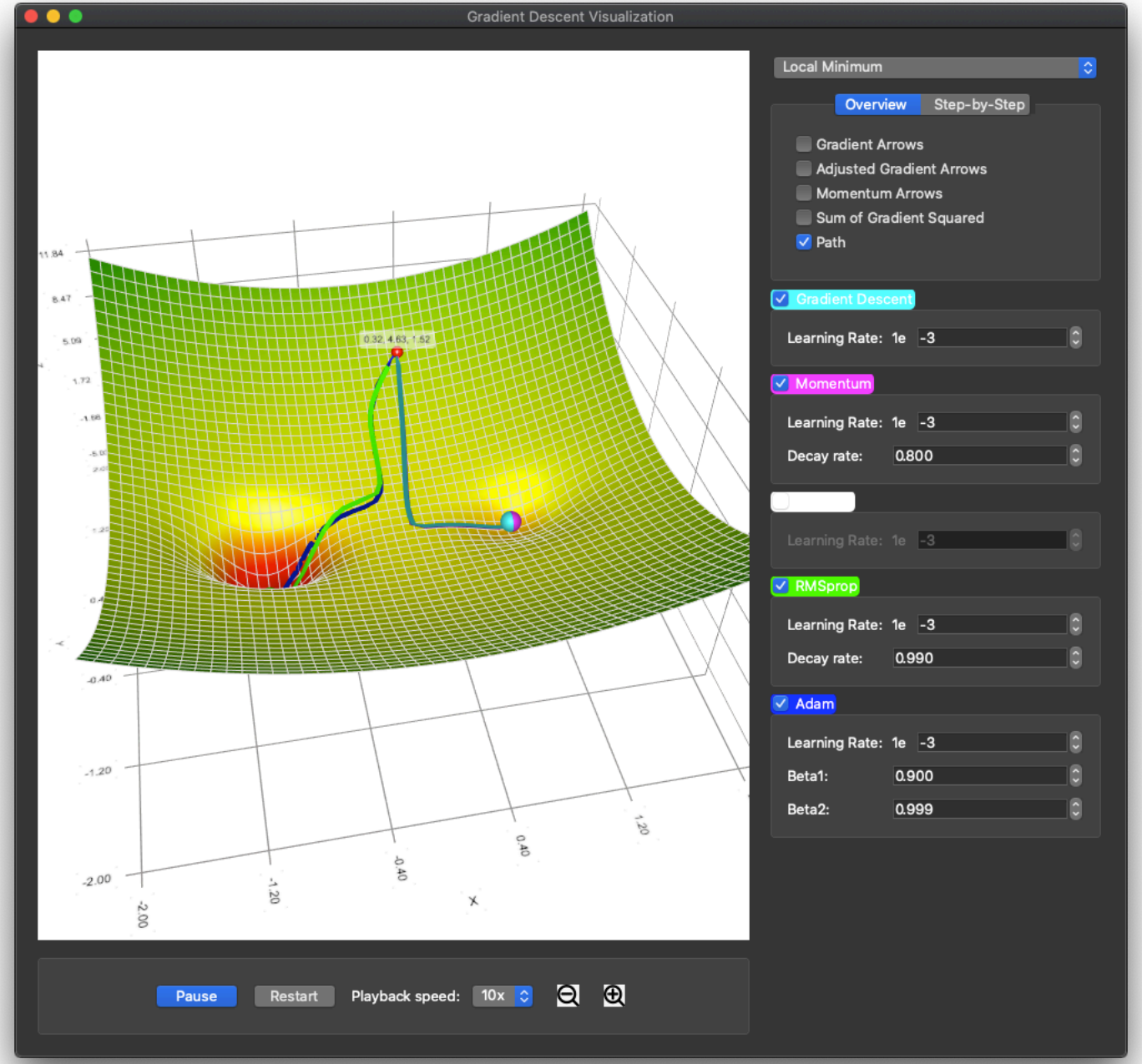
学习率
learning rate

Training Neural Networks is Difficult



"Visualizing the loss landscape of neural nets". Dec 2017.

训练神经网络： optimizer 优化器



Reference

1. MIT 6.S191 Introduction to Deep Learning
   http://introtodeeplearning.com
2. Gradient Descent Visualization
   https://github.com/lilipads/gradient_descent_viz
3. A Visual Explanation of Gradient Descent Methods (Momentum, AdaGrad, RMSProp, Adam)
   https://towardsdatascience.com/a-visual-explanation-of-gradient-descent-methods-momentum-adagrad-rmsprop-adam-f898b102325c