ФИНАНСОВЫЙ УНИВЕРСИТЕТ
ПРИ ПРАВИТЕЛЬСТВЕ РОССИЙСКОЙ ФЕДЕРАЦИИ

Современные нейросетевые технологии

Лекция 7. Keras API

Сроки выполнения

ФИНАНСОВЫЙ УНИВЕРСИТЕТ

github.com/balezz/modern_dl
Сверточная сеть:
А4 – 20.10.2021 г.

Дополнительные материалы:

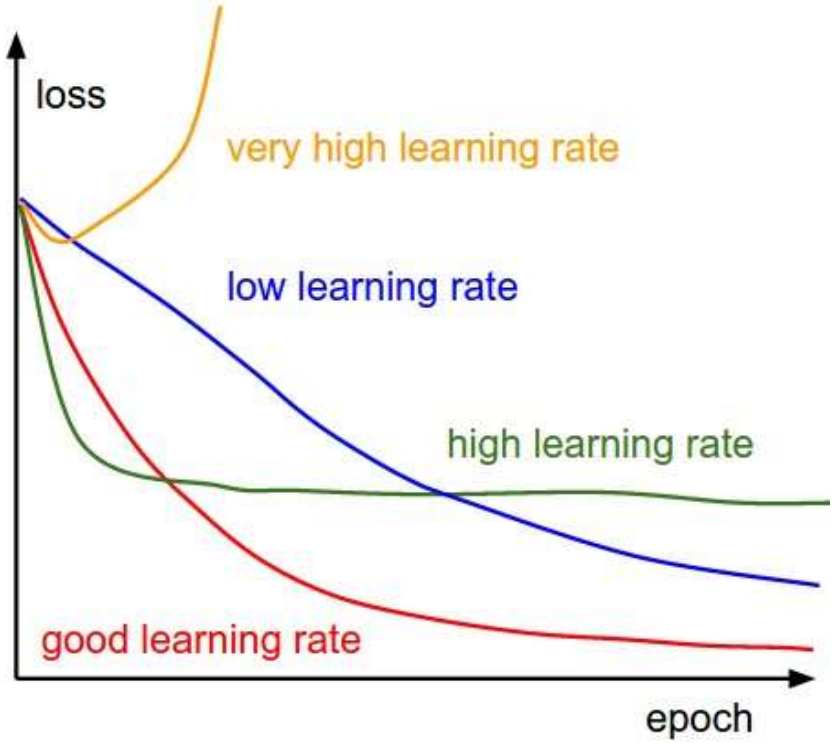
- **dlcourse.ai**
- **cs231n.stanford.edu**
- **cs230.stanford.edu**

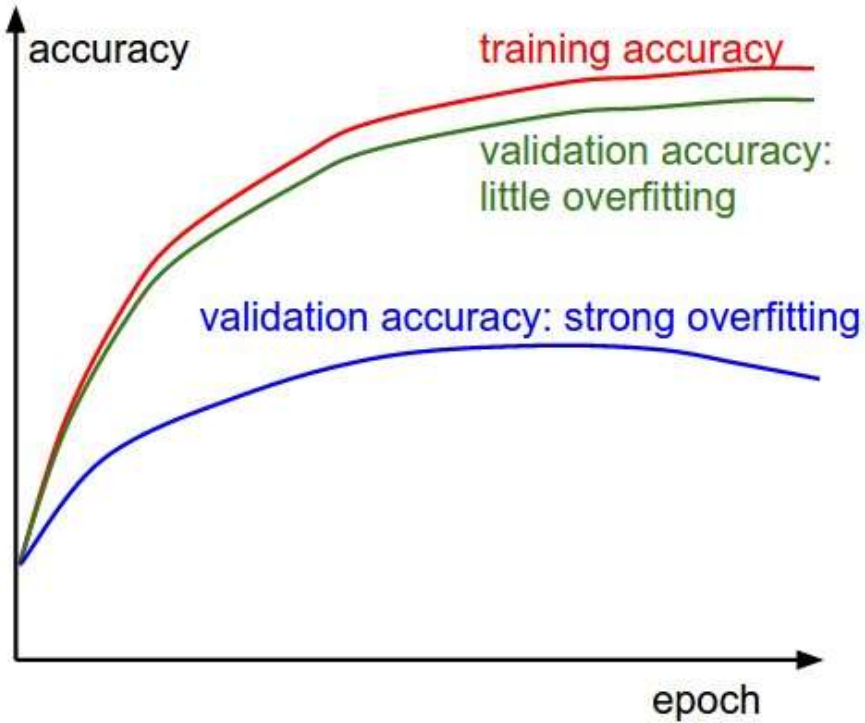
НА ПРОШЛОМ ЗАНЯТИИ

ФИНАНСОВЫЙ УНИВЕРСИТЕТ

Pipeline:

1. Collect, label and preprocess data.
2. Choose the network architecture.
3. Check that the loss is reasonable. (e.g. 2.3 for 10 classes)
4. Overfitting on small data subset (e.g. 20 samples).

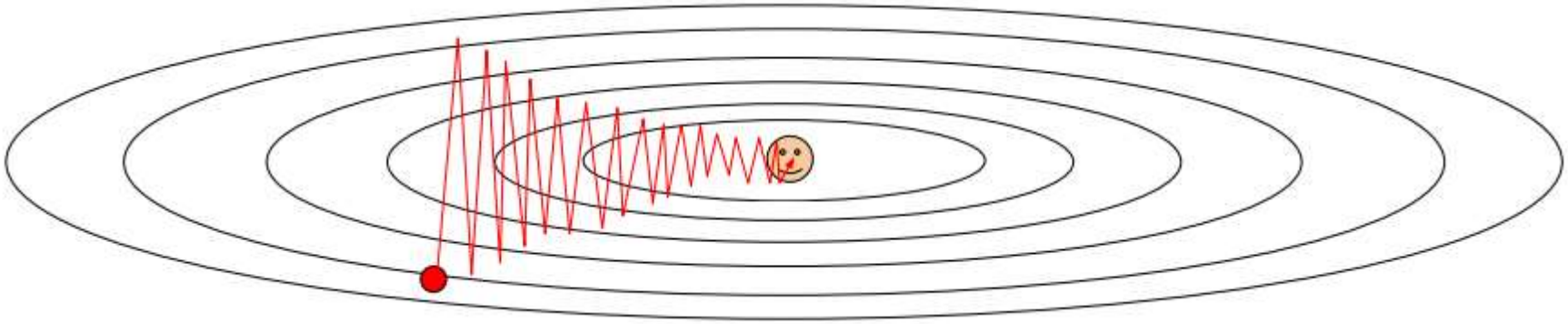


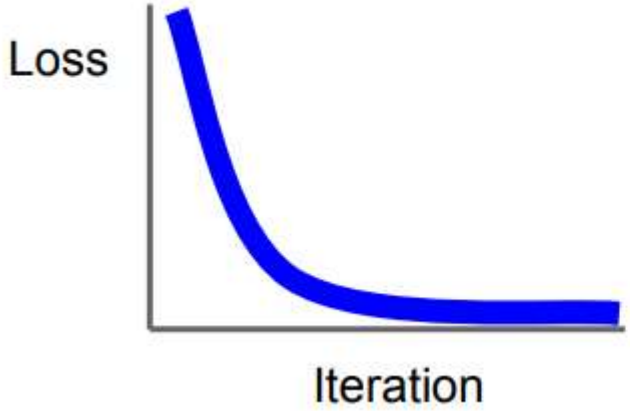


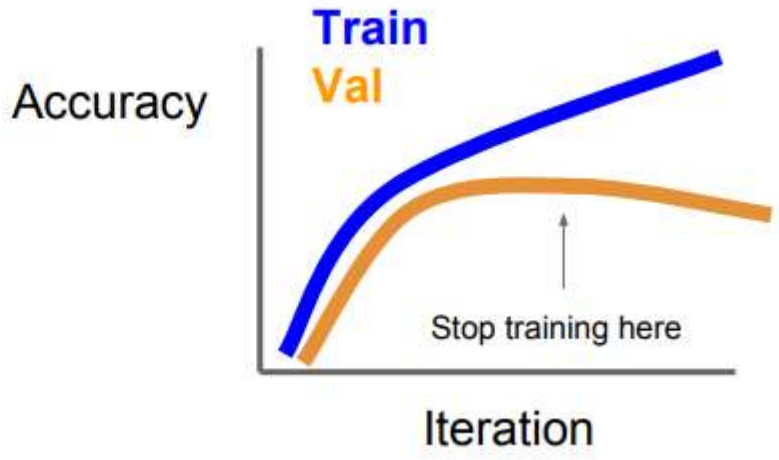
НА ПРОШЛОМ ЗАНЯТИИ

ФИНАНСОВЫЙ УНИВЕРСИТЕТ

SGD, SGD+Momentum, Adagrad, RMSProp, Adam







ФИНАНСОВЫЙ УНИВЕРСИТЕТ

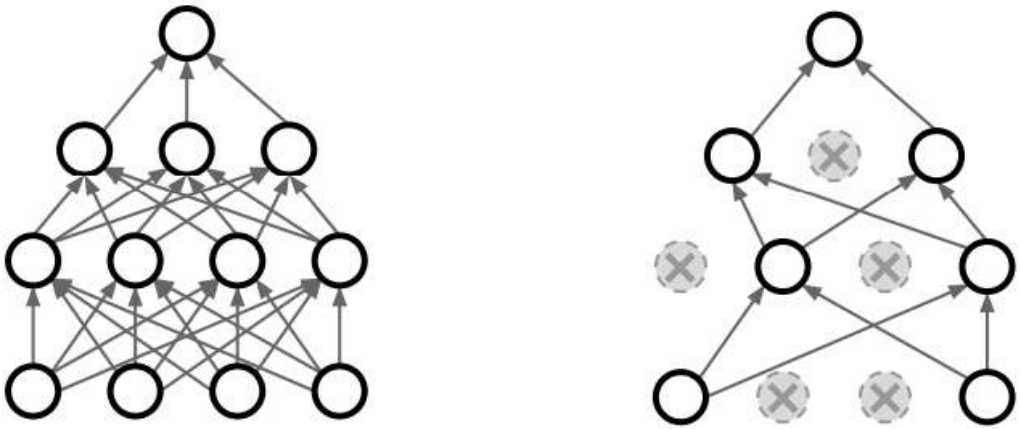
Regularization: Add term to loss

$$L = \frac{1}{N}\sum_{i=1}^{N}\sum_{j\neq y_i}\max(0, f(x_i; W)_j - f(x_i; W)_{y_i} + 1) + \boxed{\lambda R(W)}$$

Regularization: Dropout

In each forward pass, randomly set some neurons to zero

Probability of dropping is a hyperparameter; 0.5 is common



Srivastava et al, "Dropout: A simple way to prevent neural networks from overfitting", JMLR 2014

НА ПРОШЛОМ ЗАНЯТИИ

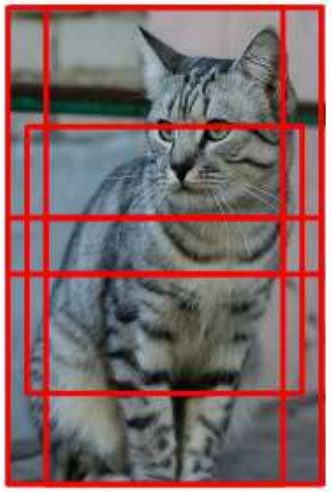
ФИНАНСОВЫЙ УНИВЕРСИТЕТ

Data Augmentation

Horizontal Flip

Color Jitter

Random Crop



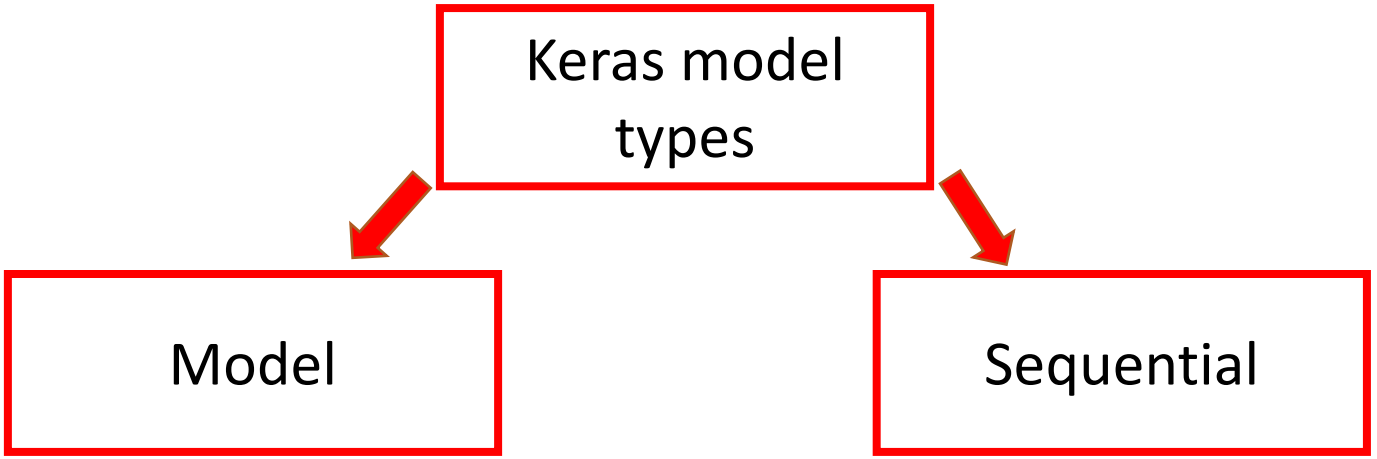
KERAS API

ФИНАНСОВЫЙ УНИВЕРСИТЕТ

- Models API
- Layers API
- Callbacks API
- Optimizers
- Metrics
- Losses

- Data preprocessing
- Built-in datasets
- Keras applications
- Mixed precision
- Utilites
- Keras Tuner

Model creating



- Functional API
- Model class inherit

- List of layers
- add() method