

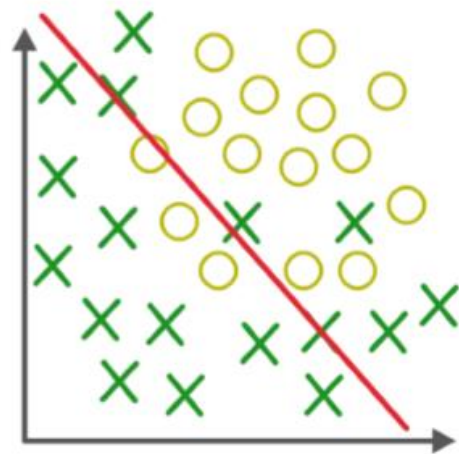
# Lab1

陈厚双

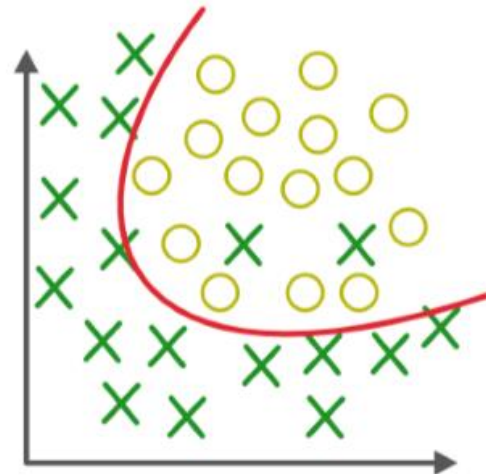
[chenhoushuang@sjtu.edu.cn](mailto:chenhoushuang@sjtu.edu.cn)

# Model training

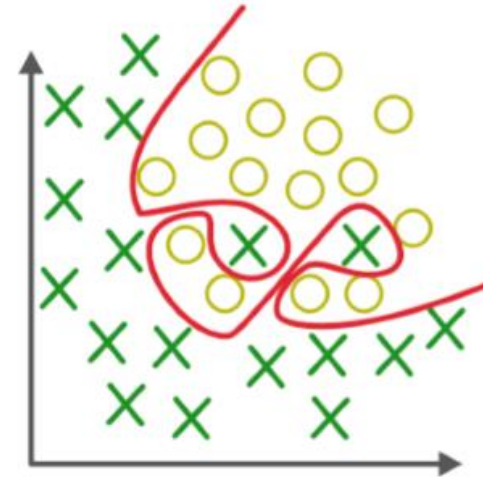
- How well will the model generalize to new data?



Under-fitting



Appropriate-fitting

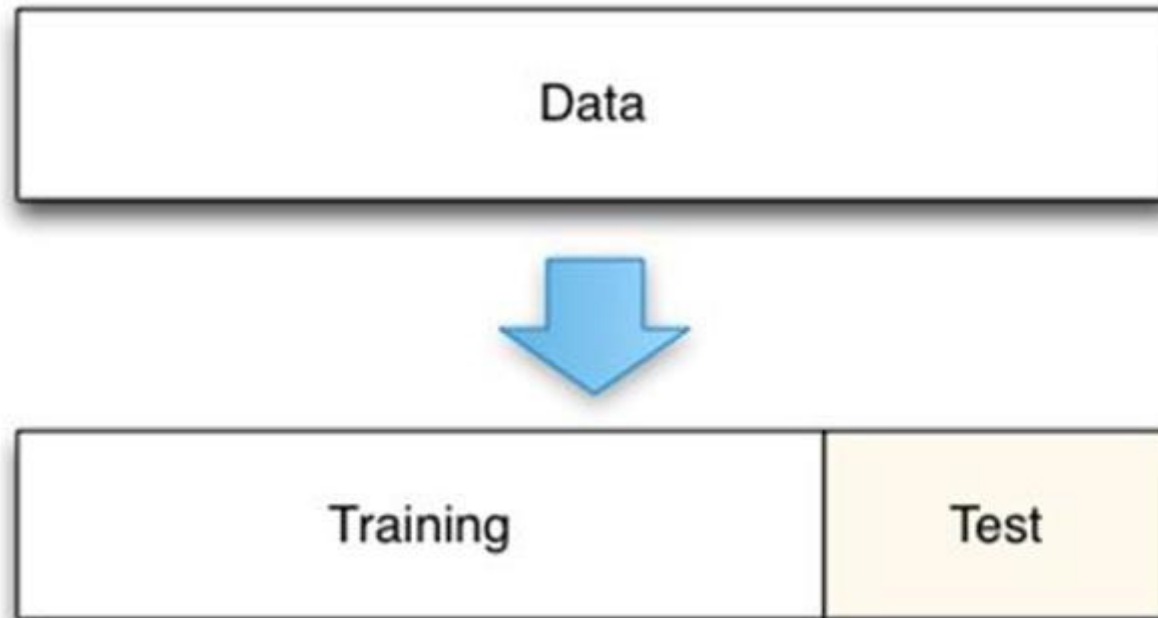


Over-fitting

- Use some test data to check

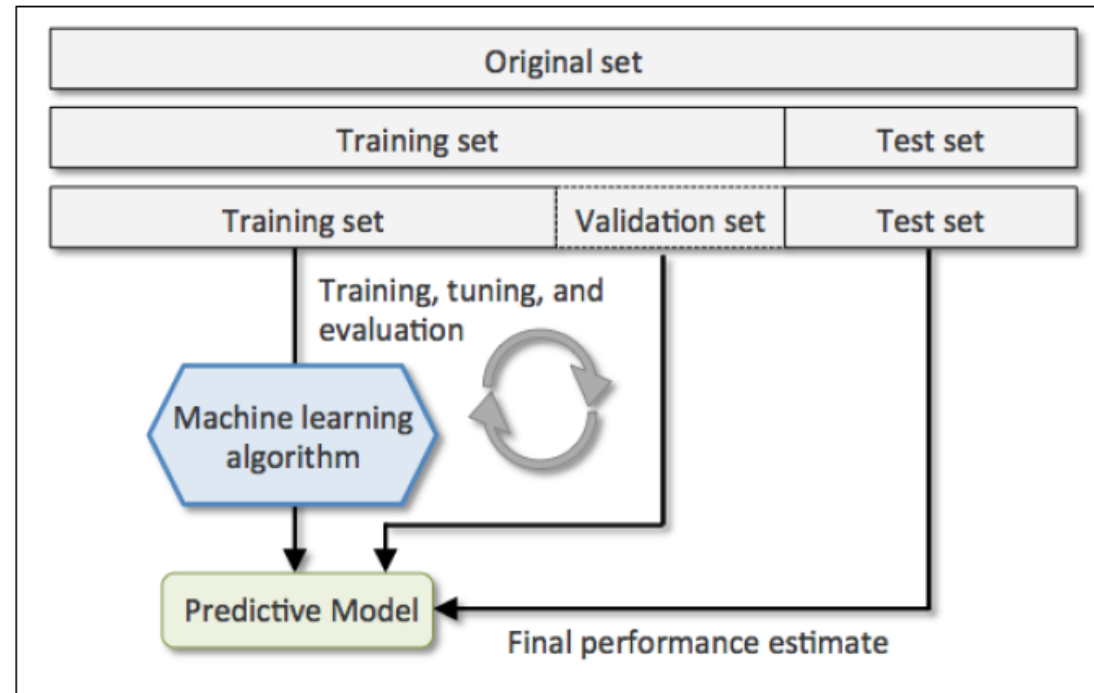
# Model training

- Split dataset to training and test
- Training models on training dataset
- The evaluation of the model is the error on test dataset



# Cross validation

- Purpose
  - maximize the use of the available data for training and then testing a model
- Hand-Out method



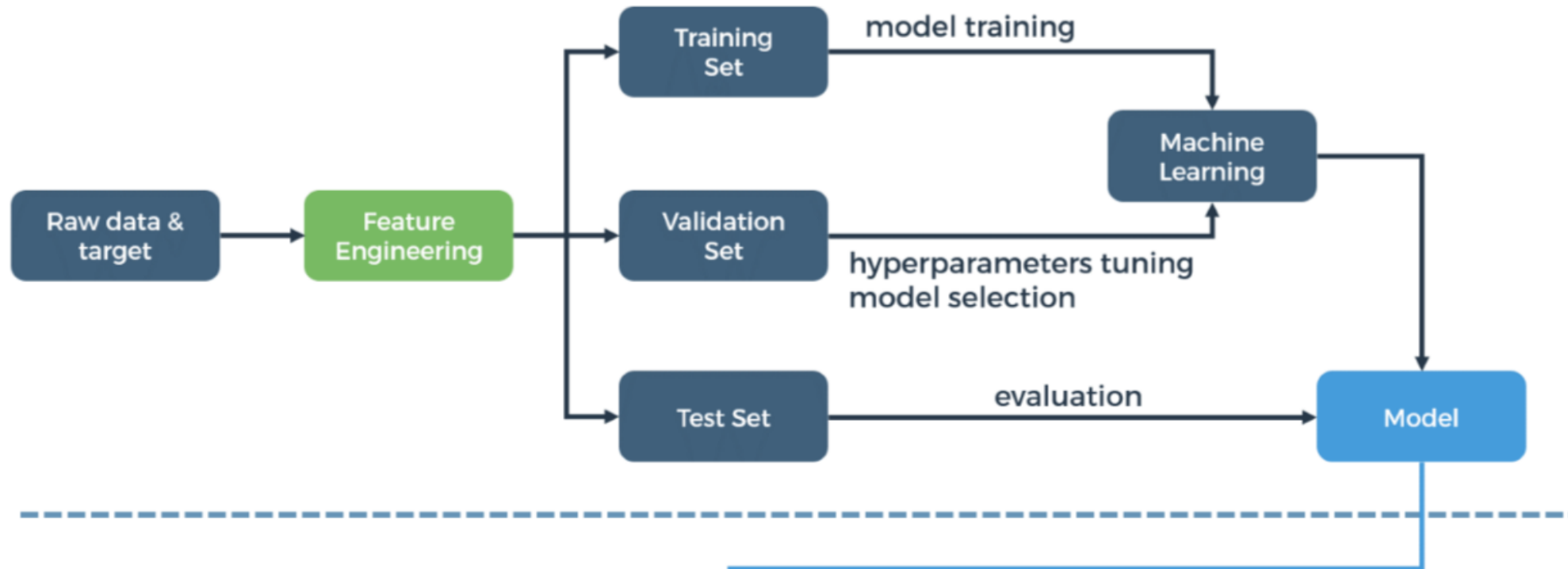
# Cross validation

- Purpose
  - maximize the use of the available data for training and then testing a model
- Hand-Out method
- K-fold classification



# Machine Learning Process

## TRAINING



## PREDICTING



# Tensorflow Installation

- Step1: Install anaconda
  - <https://www.anaconda.com/distribution/>

 Windows |  macOS |  Linux

## Anaconda 2019.10 for Windows Installer

### Python 3.7 version

Download

64-Bit Graphical Installer (462 MB)  
32-Bit Graphical Installer (410 MB)

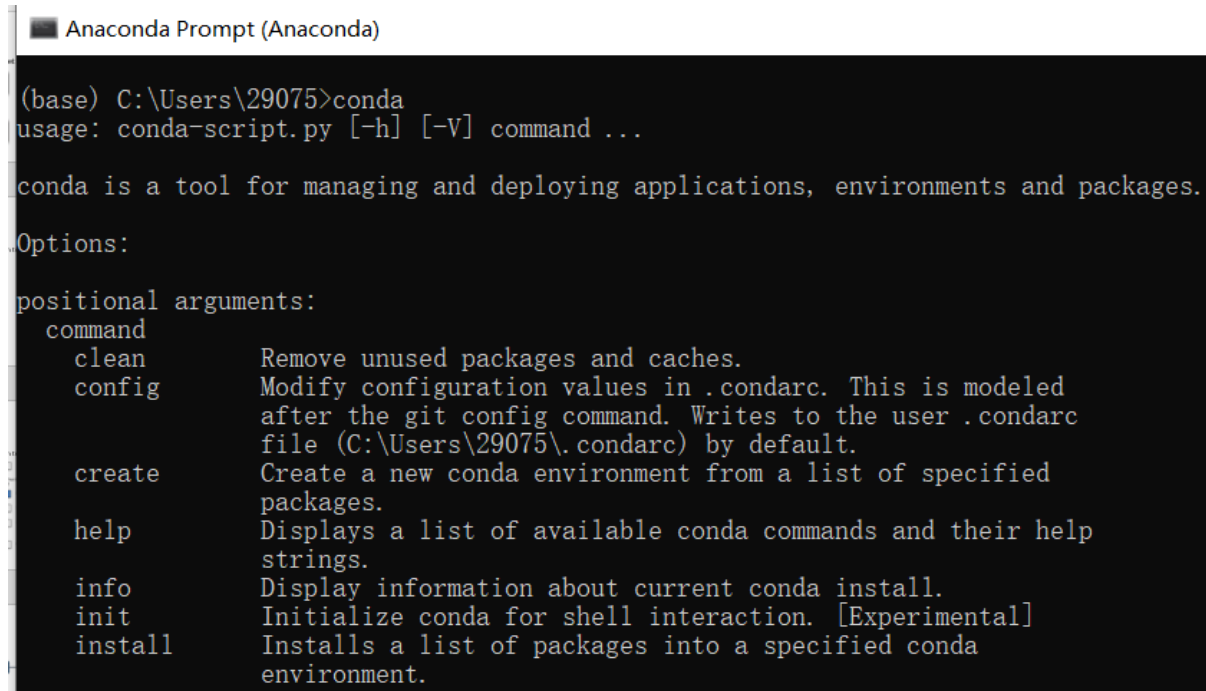
### Python 2.7 version

Download

64-Bit Graphical Installer (413 MB)  
32-Bit Graphical Installer (356 MB)

# Tensorflow Installation

- Step1: Install anaconda
  - <https://www.anaconda.com/distribution/>
  - After successful installation, check in anaconda prompt through 'conda'



```
Anaconda Prompt (Anaconda)

(base) C:\Users\29075>conda
usage: conda-script.py [-h] [-V] command ...

conda is a tool for managing and deploying applications, environments and packages.

Options:
  -h, --help            show this help message and exit
  -V, --version          display the version number and exit

positional arguments:
  command
  clean                Remove unused packages and caches.
  config               Modify configuration values in .condarc. This is modeled
                       after the git config command. Writes to the user .condarc
                       file (C:\Users\29075\.condarc) by default.
  create               Create a new conda environment from a list of specified
                       packages.
  help                 Displays a list of available conda commands and their help
                       strings.
  info                 Display information about current conda install.
  init                 Initialize conda for shell interaction. [Experimental]
  install              Installs a list of packages into a specified conda
                       environment.
```



# Tensorflow Installation

- Step2: create virtual environment
  - *conda create --name tensorflow python=3.5*
  - It downloads the necessary packages needed for TensorFlow setup

```
Command Prompt - conda create --name tensorflow python=3.5
vc-14                | h0510ff6_3          | 3 KB
wincertstore-0.2    | py35hfbbdb8_0      | 13 KB
wheel-0.31.1        | py35_0             | 81 KB
certifi-2018.4.16   | py35_0             | 143 KB
python-3.5.5         | h0c2934d_2         | 18.2 MB
-----
Total:              |                    | 20.8 MB

The following NEW packages will be INSTALLED:

certifi:      2018.4.16-py35_0
pip:          10.0.1-py35_0
python:       3.5.5-h0c2934d_2
setuptools:   39.2.0-py35_0
vc:           14-h0510ff6_3
vs2015_runtime: 14.0.25123-3
wheel:        0.31.1-py35_0
wincertstore: 0.2-py35hfbbdb8_0

Proceed ([y]/n)? y

Downloading and Extracting Packages
pip-10.0.1           | 1.8 MB | ##### | 100%
setuptools-39.2.0    | 593 KB | ##### | 100%
vc-14                | 3 KB   | ##### | 100%
wincertstore-0.2     | 13 KB  | ##### | 100%
wheel-0.31.1         | 81 KB  | ##### | 100%
certifi-2018.4.16    | 143 KB | ##### | 100%
python-3.5.5         | 18.2 MB | #####4 | 70%
```

# Tensorflow Installation

- Step3: activate tensorflow environment
  - *conda activate tensorflow*

Command Prompt

```
C:\Users\Radhika>activate tensorflow  
  
(tensorflow) C:\Users\Radhika>
```

# Tensorflow Installation

- Step4: install tensorflow
  - *pip install tensorflow==1.13.1*
  - *pip install tensorflow-gpu==1.13.1*

## Step5: test tensorflow

```
(tensorflow1.13) C:\Users\29075>python
Python 3.5.4 |Continuum Analytics, Inc. | (default, Aug 14 2017, 13:41:13) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:526: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  _np_qint8 = np.dtype(["qint8", np.int8, 1])
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:527: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  _np_quint8 = np.dtype(["quint8", np.uint8, 1])
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:528: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  _np_qint16 = np.dtype(["qint16", np.int16, 1])
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:529: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  _np_quint16 = np.dtype(["quint16", np.uint16, 1])
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:530: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  _np_qint32 = np.dtype(["qint32", np.int32, 1])
D:\ProgramFile\Anaconda\envs\tensorflow1.13\lib\site-packages\tensorflow\python\framework\dtypes.py:535: FutureWarning: Passing (type,
future version of numpy, it will be understood as (type, (1,)) / '(1,)type'.
  np_resource = np.dtype(["resource", np.ubyte, 1])
>>> a = tf.constant('hello, world!')
>>> sess = tf.Session()
2019-10-24 12:46:15.339594: I tensorflow/core/platform/cpu_feature_guard.cc:141] Your CPU supports instructions that this TensorFlow b
>>> sess.run(a)
b'hello, world!'
>>>
```

# Tensorflow Introduction

- <http://cs224d.stanford.edu/lectures/CS224d-Lecture7.pdf>
- A simple demo for this lab
  - <https://www.kaggle.com/chenhoushuang/cnn-demo>

Q&A