

Machine learning & TensorFlow



9기 김남호

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- TensorFlow
- 성적 예측 프로그램

Machine Learning

기계학습

관심

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Peak of

Inflated

Expectations

Innovation

Trigger

Years to mainstream adoption:

2017년 Gatner hypercycle 보고서

Trough of

Disillusionment

time

5 to 10 years



As of July 2016

Plateau of

Productivity

obsolete before diateau

Slope of Enlightenment

△ more than 10 years

02

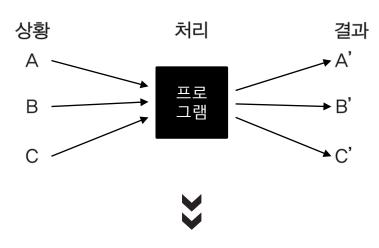
03

04

>> What is Machine Learning?

vvilat is iviaci iii ic Leai i iii ig :

기존 Explicit Program



Machine Learning



TensorFlow

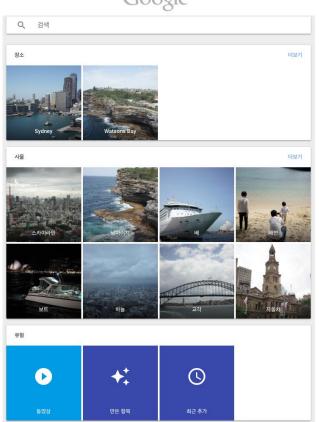
04

>> Machine Learning in use



Google









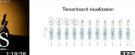
The Best of Paganini Classical Music11 조회수 1,241,239회 • 2년 전



My top 10 favorite waltz RX 조회수 65,984회 • 1년 전



Amadeus Soundtrack [Special Edition: Director's Cut] - Full... Gemini Moon 조회수 164,062회 • 3년 전



lec10-1: Sigmoid 보다 ReLU가 더 좋아 Sung Kim 조회수 7,276회 • 7개월 전



소용안 크디스마스 글대식, = 리스마스 캐롤, 캐롤송, 크리. Hoffmann Linden 조회수 376,028회 • 11개월 전



짱구는 못말려 - 수지가 만든 도시락을 먹어요 - 불타라 어... Issac R. Henry 조회수 4,401회 - 3주 전



김현호: 오늘 당장 딥러닝 실험 하기 - PyCon Korea 2015 PyCon KR 조회수 284회 • 3개월 전



짱구는 못말려 - 수지가 만든 도시락을 먹어요 - 짱구는 못.. Marlene J. Edwards 조회수 906회 • 3주전

더보기

03

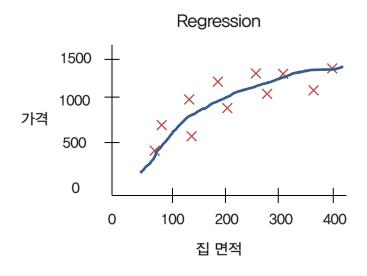
04

Supervised Learning Unsupervised learning

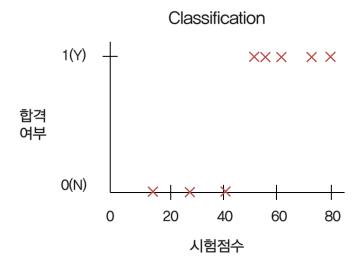
Machine Learning

Supervised Learning

학습할 데이터의 결과가 무엇인지 정해져 있다. mapping



결과가 연속적 집 평수 – 가격



결과가 비연속적 시험점수 - 합/불 종양크기 - 음성/양성

Supervised Learning Unsupervised learning

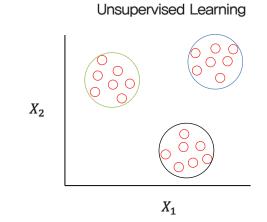
Machine Learning

Unsupervised Learning

학습할 데이터의 결과가 무엇인지 정해져 있지 않다. no label

0 0 X X_2 X_1

Supervised Learning



군집화 SNS의 가까운 사람

TensorFlow

텐서플로

02

03

>> What is TensorFlow?

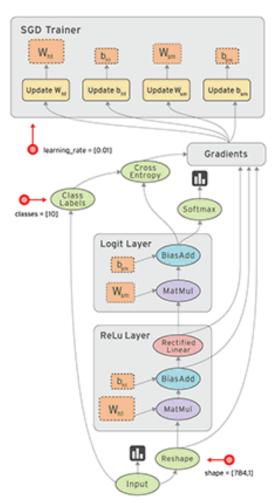
Open Source Library



Google Brain Team

Make machines intelligent. Improve people's lives.

Data Flow Graph



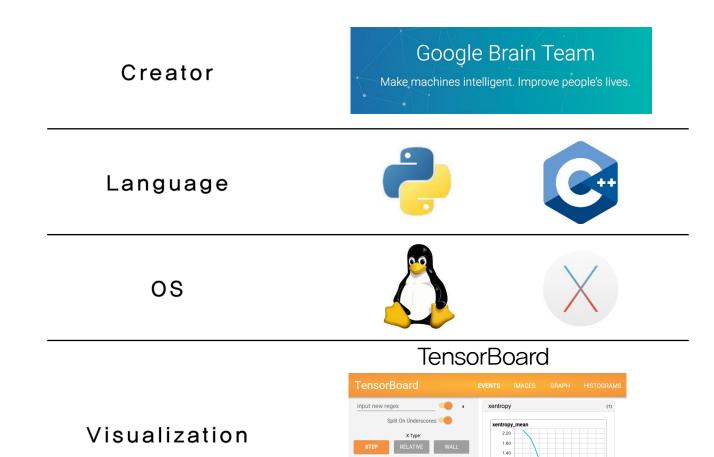
TensorFlow

01

>> What is TensorFlow?

02

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Selected Runs:

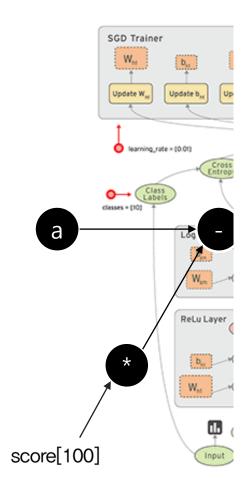
0.200 -

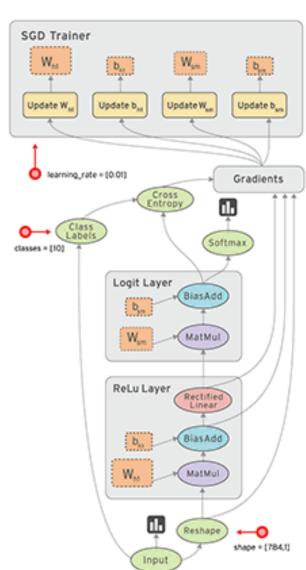
0.000 400.0 800.0 1.200k 1.600k

 \bigcirc 1

02

>> Data Flow Graph

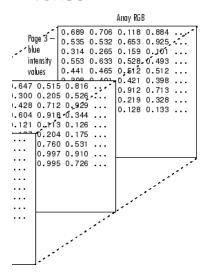




peration

선달되는 tensor

Tensor







성적 예측 프로그램

Linear Regression

Score

01

>> Training Data

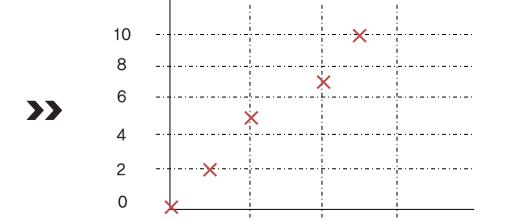
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학습시간-성적 관계

X(Hours)	Y(Score)
0	0
1	2
2	5
4	7
5	10



2

4

0

Hours

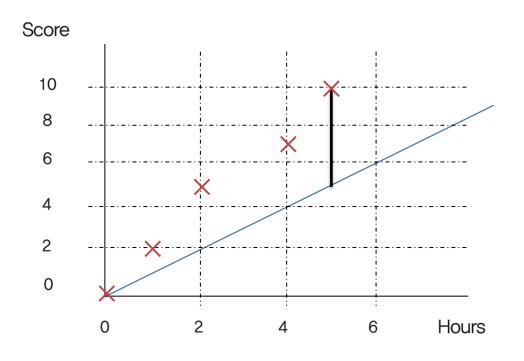
6

>> Hypothsis & Cost

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Hypothesis(가설)

$$H(x) = Wx + b$$

Cost

$$Cost = (H(x) - y))^2$$

$$Cost(W, b) = \frac{1}{m} \sum_{i=1}^{m} (H(x^{(i)}) - y^{(i)})^2$$

04

```
>> 소스코드
```

```
import tensorflow as tf
3
       # train data
       x data = [0, 1, 2, 4, 5]
                                  # 공부시간
       y data = [0, 2, 5, 7, 10]
       # 임의의 W,b 를 생성한다.
       W = tf.Variable(tf.random uniform([1], -1.0, 1.0))
8
       b = tf.Variable(tf.random uniform([1], -1.0, 1.0))
9
10
       # placeholder
11
       X = tf.placeholder(tf.float32)
12
       Y = tf.placeholder(tf.float32)
13
14
       # hypothesis
15
                                       H(x) = Wx + b
       hypothesis = W * X + b
16
17
                                                              Cost(W,b) = \frac{1}{m} \sum_{i=1}^{m} (H(x^{(i)}) - y^{(i)})^{2}
18
       # cost function
       cost = tf.reduce mean(tf.square(hypothesis - Y))
19
20
21
       # minimize
22
       a = tf.Variable(0.1) # Learning rate, alpha
                                                             Cost를 최소화 하는 W.b를 찾기
       optimizer = tf.train.GradientDescentOptimizer(a)
23
       train = optimizer.minimize(cost)
24
25
26
       # initialize the variables
       init = tf.initialize all variables()
27
       sess = tf.Session()
28
       sess.run(init)
29
30
31
       # 2001번의 학습
32
       for step in xrange(2001):
                                                                         실제 데이터 처리
33
           sess.run(train, feed dict={X: x data, Y:y data})
34
35
       # 공부시간이 3시간?
       print "3 hour Score : ", sess.run(hypothesis, feed dict={X_: 3})
36
37
       # 공부시간이 6시간?
       print "6 hour Score : ", sess.run(hypothesis, feed dict={X : 6})
38
```

>>

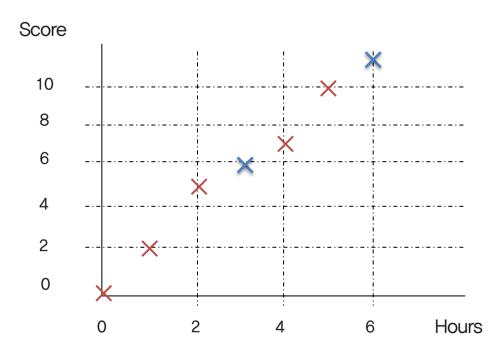
결과

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3 hour Score : [5.93024111] 6 hour Score : [11.58141232]



Thank you

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