



# 파이썬과 기초 머신러닝

(Python, Based statistics and Machine Learning)

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The background features a light blue DNA double helix on the left side. Scattered across the page are several chemical structures, including benzene rings, hexagons, and various molecular fragments, all rendered in a dark teal color. A large, dark teal speech bubble is positioned in the center-right, containing the text '발표자 소개'.

## 발표자 소개

# 발표자 소개



Seungwoo Han

팔로우

MSc Course, Embedded Software Engineering, [Kwangwoon University](http://kw.ac.kr).  
[kw.ac.kr](http://kw.ac.kr)의 이메일 확인됨 - [홈페이지](#)

Deep Learning Bio-Medical Engineering Neuroscience Signal Processing Pattern Recognition

제목	인용	연도
랜덤 소수 생성 방법 및 그를 위한 장치 박철수, 유호영, 조만희, 한승우 KR Patent App. .		2019
심전도와 맥파를 이용한 강화학습 기반 혈압 추정 알고리즘 한승우, 엄희상, 조태를, 박광석, 박철수 대한의용생체공학회 춘계학술대회		2019
심전도, 맥파 및 심탄도를 이용한 딥러닝 기반 혈압 추정 엄희상, 한승우, 박광석, 이동석, 박철수 대한의용생체공학회 춘계학술대회		2019
심전도와 맥파를 이용한 딥러닝 기반 실시간 혈압 추정 연구 한승우, 엄희상, 박광석, 이동석, 박철수 한국통신학회 학술대회논문집		2019
사용자의 집중도를 판단하는 방법 및 이를 위한 웨어러블 디바이스 박철수, 이희준, 여민수, 한승우, 김규민 KR Patent App. .		2018

## Google Scholar

Conference Paper - 5

Patents - 2

1<sup>st</sup> ML with Kaggle Korea Competition – Top 44%

Certificate - Machine Learning from Coursera

Competitions Contributor



Unranked

0

0

0

2019 1st ML month with Ka...  
6 months ago-Top 44%

155<sup>th</sup>  
of 353



# 01 파이썬 기초

# 파이썬 기초

- Network Applications

- HTTP
- Distributed Systems

- Web Applications & Frameworks

- Context
- Frameworks
- Web Servers
- WSGI Servers
- Server Best Practices
- Hosting
- Templating

- HTML Scraping

- Web Scraping
- lxml and Requests

- GUI Applications

- Camelot
- Cocoa
- GTK
- PyGObject aka (PyGi)
- Kivy
- PyObjC
- PySide
- PyQt
- Pyjs Desktop (formerly Pyjamas Desktop)
- Qt
- PySimpleGUI
- Toga
- Tk
- wxPython



# 파이썬 기초

## Libraries

### NumPy

NumPy is a low level library written in C (and Fortran) for high level mathematical functions. NumPy cleverly overcomes the problem of running slower algorithms on Python by using multidimensional arrays and functions that operate on arrays. Any algorithm can then be expressed as a function on arrays, allowing the algorithms to be run quickly.

NumPy is part of the SciPy project, and is released as a separate library so people who only need the basic requirements can use it without installing the rest of SciPy.

NumPy is compatible with Python versions 2.4 through 2.7.2 and 3.1+.

### Numba

Numba is a NumPy aware Python compiler (just-in-time (JIT) specializing compiler) which compiles annotated Python (and NumPy) code to LLVM (Low Level Virtual Machine) through special decorators. Briefly, Numba uses a system that compiles Python code with LLVM to code which can be natively executed at runtime.

### SciPy

SciPy is a library that uses NumPy for more mathematical functions. SciPy uses NumPy arrays as the basic data structure, and comes with modules for various commonly used tasks in scientific programming, including linear algebra, integration (calculus), ordinary differential equation solving, and signal processing.

### Matplotlib

Matplotlib is a flexible plotting library for creating interactive 2D and 3D plots that can also be saved as manuscript-quality figures. The API in many ways reflects that of MATLAB, easing transition of MATLAB users to Python. Many examples, along with the source code to recreate them, are available in the matplotlib gallery.

### Pandas

Pandas is a data manipulation library based on NumPy which provides many useful functions for accessing, indexing, merging, and grouping data easily. The main data structure (DataFrame) is close to what could be found in the R statistical package; that is, heterogeneous data tables with name indexing, time series operations, and auto-alignment of data.

- Scientific Applications

- Context
- Tools
- Libraries
- Resources

- Machine Learning

- SciPy Stack
- scikit-learn





## 02 기초 통계학



# 기초 통계학 (상관 분석)

상관분석 (통계학에서 두 변수 간의 어떤 Linear Relationship을 갖고 있는지 분석하는 방법)

많은 수의 상관 계수 분석이 있지만 가장 널리 쓰이는 것은 피어슨 상관 계수

피어슨 상관계수는 수학적으로 말하면 '전체 편차' 내에서 '예측치와 평균 간의 차이'가 차지하는 비율

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{[\sum X^2 - \frac{(\sum X)^2}{n}][\sum Y^2 - \frac{(\sum Y)^2}{n}]}}$$

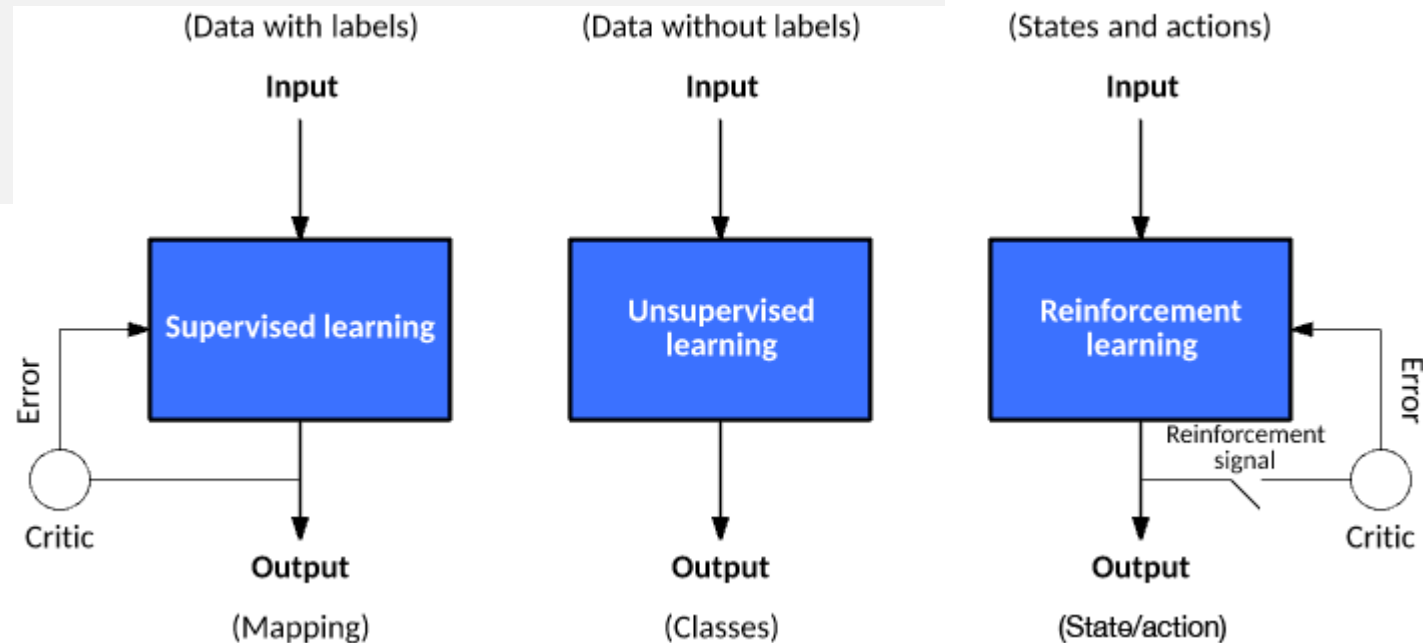


## 03 머신러닝 종류

# 머신러닝 종류

## II. 인공지능 분류 ML & DL & RL

- 머신러닝(ML), 딥러닝(DL), 강화학습(RL)
- 딥러닝도 머신러닝의 일종
- 파이썬과 R이 머신러닝을 구현하기 쉬운 대표적인 언어
- 인공신경망 라이브러리는 tensorflow, keras, pytorch 등



## II. 파이썬 라이브러리 선택 ML & DL & RL

- Hidden Markov Model ([hmmlearn](#))
- K-Means Clustering ([from sklearn.cluster import Kmeans](#))
- Support Vector Machine ([from sklearn.svm import SVC](#))
- Convolutional Neural Network ([Tensorflow](#) or [Keras](#) or [Pytorch](#))
- [Etc...](#)

Linear Regression ([from sklearn.linear\\_model import LinearRegression](#))



## 03 머신러닝 기초 및 연습

심전도와 맥파를 이용한 머신러닝 기반 혈압 추정

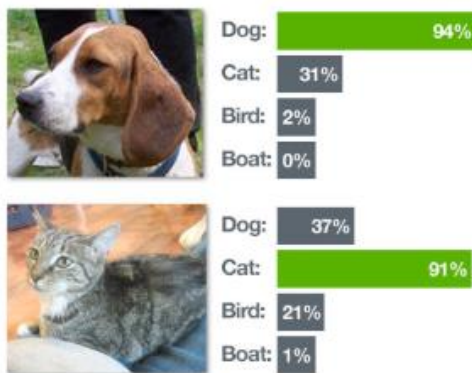
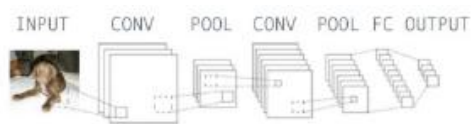
<https://github.com/Kaintels/rubyPy-study>



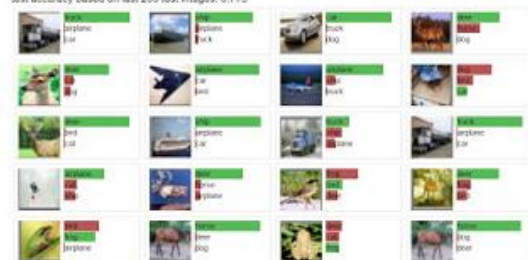
## 03 딥러닝 소개

# 딥러닝 소개

CNN (convolutional neural network)



CNN 기반 동물 이미지 학습 분류(PyImageSearch)



ConvNetJS CIFAR-10

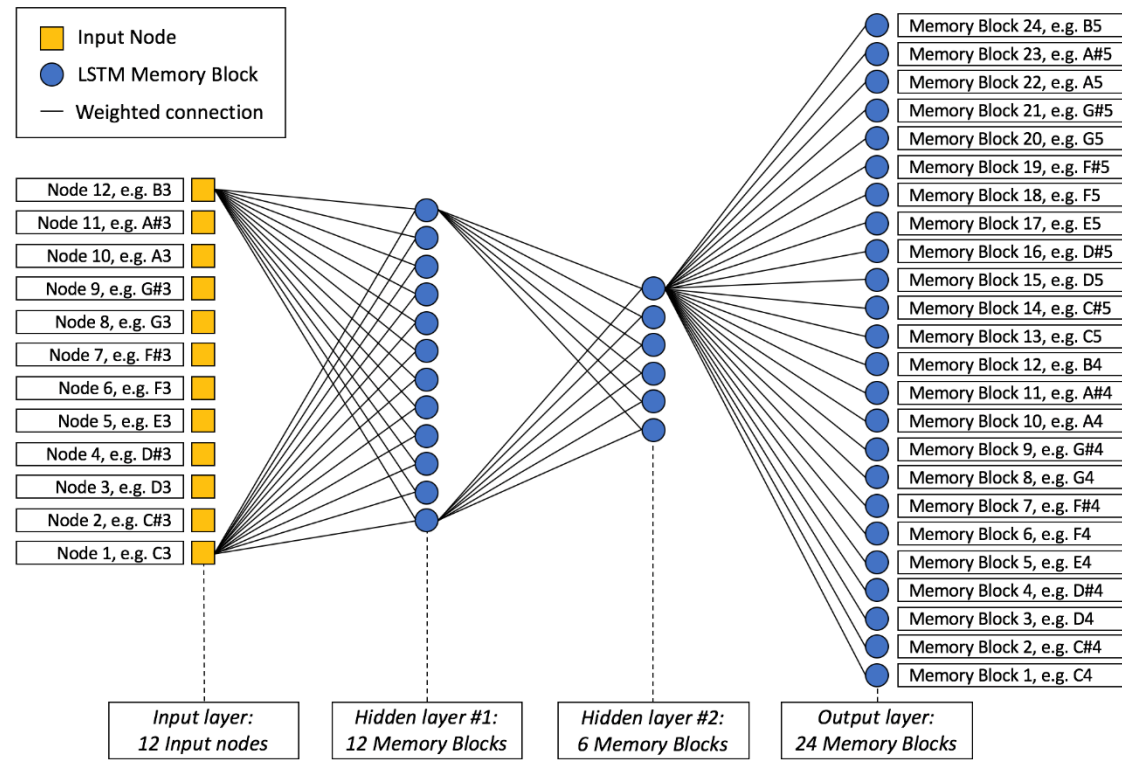
출처 :

<https://cs.stanford.edu/people/karpathy/convnetjs/demo/cifar10.html>



# 딥러닝 소개

RNN and LSTM (Recurrent Neural Network), (Long Short Term Memory)



출처 : <http://konstilackner.github.io/LSTM-RNN-Melody-Composer-Website/>



Thank You