

# How to start Deep Learning

## 1. How to study deep learning

### 1) 온라인 강의 수강

- Udacity / Deep Learning  
(<https://classroom.udacity.com/courses/ud730>)
- 모두를 위한 딥러닝 – 기본적인 머신러닝과 딥러닝 강좌  
(<https://www.infllearn.com/course/기본적인-머신러닝-딥러닝-강좌/>)
- CS231n: Convolutional Neural Networks for Visual Recognition  
(<http://cs231n.stanford.edu/>)

### 2) 관련도서 구매

- 밑바닥부터 시작하는 딥러닝 – 한빛미디어
- 딥러닝 첫걸음 – 한빛미디어

### 3) 딥러닝 모델 구현

- 1) 프로그래밍 언어 : Python  python™
- 2) Deep learning library : pytorch, tensorflow, keras, caffe ...

**PYTORCH**  **TensorFlow™**  **Keras**

- 3) GPU.. : Titan Xp(12GB), 1080 Ti(11GB), 1060(3GB)

# How to start Deep Learning

## 2. How to get dataset (training/test)

### 1) 연구용 Public DB 사용

- NIH 100,000 Chest X-ray DataSet(<https://nihcc.app.box.com/v/ChestXray-NIHCC>)
- ISIC Dataset (for skin disease) (<https://challenge2018.isic-archive.com/>)
- Cardiac dataset (<http://stacom2017.cardiacatlas.org/>)
- Cancer Imaging Archive (TCIA) collections (<http://www.cancerimagingarchive.net/>)

### 2) Challenge DB 사용

- 유관학회(MICCAI 등) Grand Challenge
- Kaggle Challenge → 상금!

### 3) 의료 데이터 공개 사이트 정리 → <https://github.com/awesomedata/awesome-public-datasets>

# Grand Challenges in Biomedical Image Analysis

[https://grand-challenge.org/All\\_Challenges/](https://grand-challenge.org/All_Challenges/)

**2018**



## BreastPathQ

SPIE-AAPM-NCI BreastPathQ:Cancer Circularity Challenge: Participants will be tasked to develop an automated method for analyzing histology patches extracted from whole slide images and assign a score reflecting cancer cellularity for tumor burden assessment in each.

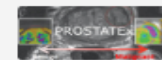
Hosted on: [grand-challenge.org](https://grand-challenge.org)



## HC18

Automated measurement of fetal head circumference using 2D ultrasound images

Hosted on: [grand-challenge.org](https://grand-challenge.org)



## PROSTATEx

Classification of clinical significance of prostate lesions using multi-parametric MRI data

Hosted on: [grand-challenge.org](https://grand-challenge.org)



## Peripheral Artery:Vein Enhanced Segmentation (PAVES)

Peripheral Artery:Vein Enhanced Segmentation (PAVES) is the challenge focussed on providing easily interpretable and relevant images that can be readily understood by clinicians (vascular interventional radiologists & vascular surgeons)

Open for submissions

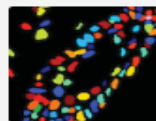
[Data download](#)

Results: 50

Latest result: Aug. 19, 2018

Associated with: SMRA

Hosted on: [grand-challenge.org](https://grand-challenge.org)



## Multi-Organ Nuclei Segmentation Challenge

MICCAI 2018 challenge for Multi-organ nuclei segmentation from H&E stained histopathological images.

Open for submissions

Associated with: MICCAI 2018 Satellite Events-Challenges

Hosted on: [grand-challenge.org](https://grand-challenge.org)



## Medical Segmentation Decathlon










The MSD challenge tests the generalisability of machine learning algorithms when applied to 10 different semantic segmentation task.

[Data download](#)

Hosted on: [grand-challenge.org](https://grand-challenge.org)

# Kaggle Challenge

## 15 Active Competitions

	<b>Two Sigma: Using News to Predict Stock Movements</b> Use news analytics to predict stock price performance <i>Featured</i> · 3 months to go · news agencies, time series, finance, money	\$100,000 882 teams
	<b>TGS Salt Identification Challenge</b> Segment salt deposits beneath the Earth's surface <i>Featured</i> · a day to go · geology, image data	\$100,000 3,265 teams
	<b>Airbus Ship Detection Challenge</b> Find ships on satellite images as quickly as possible <i>Featured</i> · a month to go · image data, object detection, object segmentation	\$60,000 241 teams
	<b>Google Analytics Customer Revenue Prediction</b> Predict how much GStore customers will spend <i>Featured</i> · a month to go · regression, tabular data	\$45,000 2,632 teams
	<b>Human Protein Atlas Image Classification</b> Classify subcellular protein patterns in human cells <i>Featured</i> · 3 months to go · classification, image data	\$37,000 330 teams
	<b>RSNA Pneumonia Detection Challenge</b> Can you build an algorithm that automatically detects potential pneumonia cases? <i>Featured</i> · 6 days to go · image data, medicine	\$30,000 1,328 teams
	<b>PLAsTiCC Astronomical Classification</b> Can you help make sense of the Universe? <i>Featured</i> · 2 months to go · astronomy, time series, tabular data	\$25,000 270 teams
	<b>Quick, Draw! Doodle Recognition Challenge</b> How accurately can you identify a doodle? <i>Featured</i> · 2 months to go · writing, image data	\$25,000 292 teams
	<b>Inclusive Images Challenge</b> Stress test image classifiers across new geographic distributions <i>Research</i> · 18 days to go · multiclass classification, image data	\$25,000 366 teams



<https://www.kaggle.com/datasets>

동물, 사물 등 일상데이터 뿐만 아니라  
전문의료데이터 획득 가능

# Cancer Imaging Archive (TCIA) collections

\* Cancer Imaging Archive (TCIA) collections : 암 종류에 대한 데이터 수집 가능

<http://www.cancerimagingarchive.net/>



Collection	Cancer Type	Modalities	Subjects	Location	Metadata	Access	Status	Updated
TCGA-HNSC	Head and Neck Squamous Cell Carcinoma	CT, MR, PT, RTSTRUCT, RTPLAN, RTDOSE	227	Head-Neck	Yes	Public	Ongoing	2018/08/30
<a href="#">HNSCC-3DCT-RT</a>	Head and Neck Squamous Cell Carcinoma	CT, RTSTRUCT, RTDOSE	31	Head-Neck	No	Public	Complete	2018/08/30
<a href="#">Acrin-FMISO-Brain</a>	Glioblastoma	CT, MR, PT	45	Brain	Yes	Limited	Complete	2018/08-30
<a href="#">Anti-PD-1 MELANOMA</a>	Melanoma	CT, MR, PT	47	Skin	No	Public	Complete	2018/07/31
<a href="#">CPTAC-PDA</a>	Ductal Adenocarcinoma	CT, MR, DX, CR	43	Pancreas	Yes	Public	Ongoing	2018/06/30
<a href="#">CPTAC-LUAD</a>	Adenocarcinoma	CT, MR, PT, CR	11	Lung	Yes	Public	Ongoing	2018/06/30
<a href="#">CPTAC-CM</a>	Cutaneous Melanoma	MR, CT, CR	2	Skin	Yes	Public	Ongoing	2018/06/30