

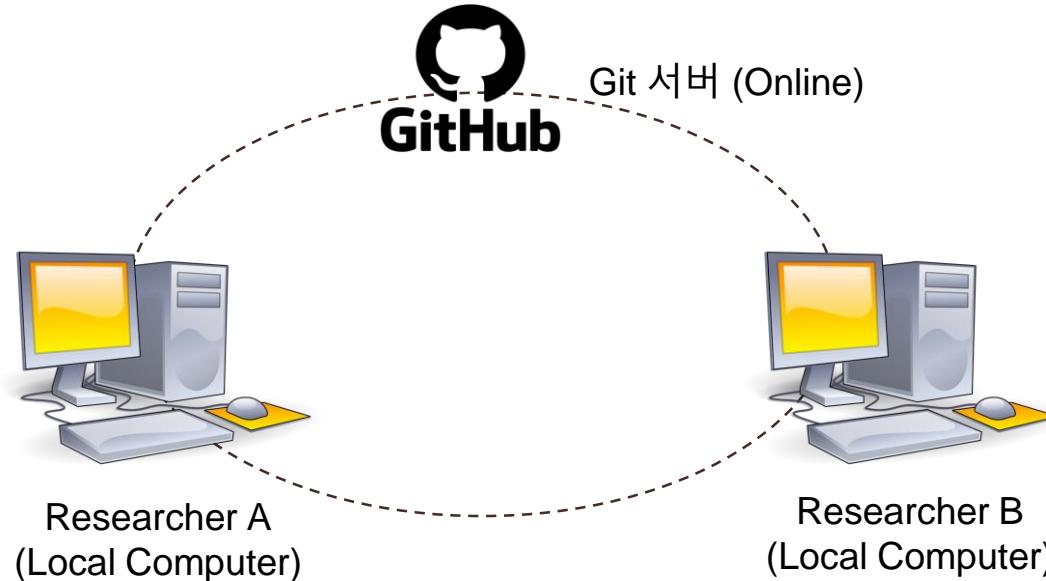
# GitHub 활용 교육

K-water연구원 연구관리처  
AI연구센터 최영돈

**Open Source의 세계로 오신 것을 환영합니다.**

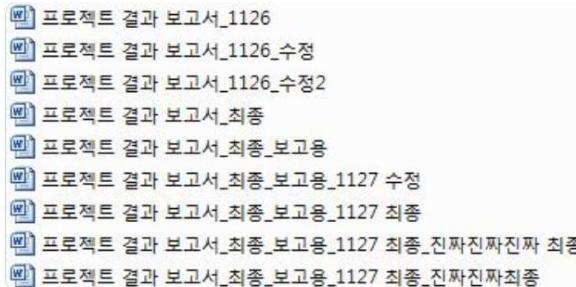
# Git 이란?

- ◆ VCS (Version Control System)
- ◆ 프로그램 등의 소스 코드 관리를 위한 분산 버전관리 시스템
- ◆ GitHub: Git을 사용하는 프로젝트를 지원하는 웹서비스

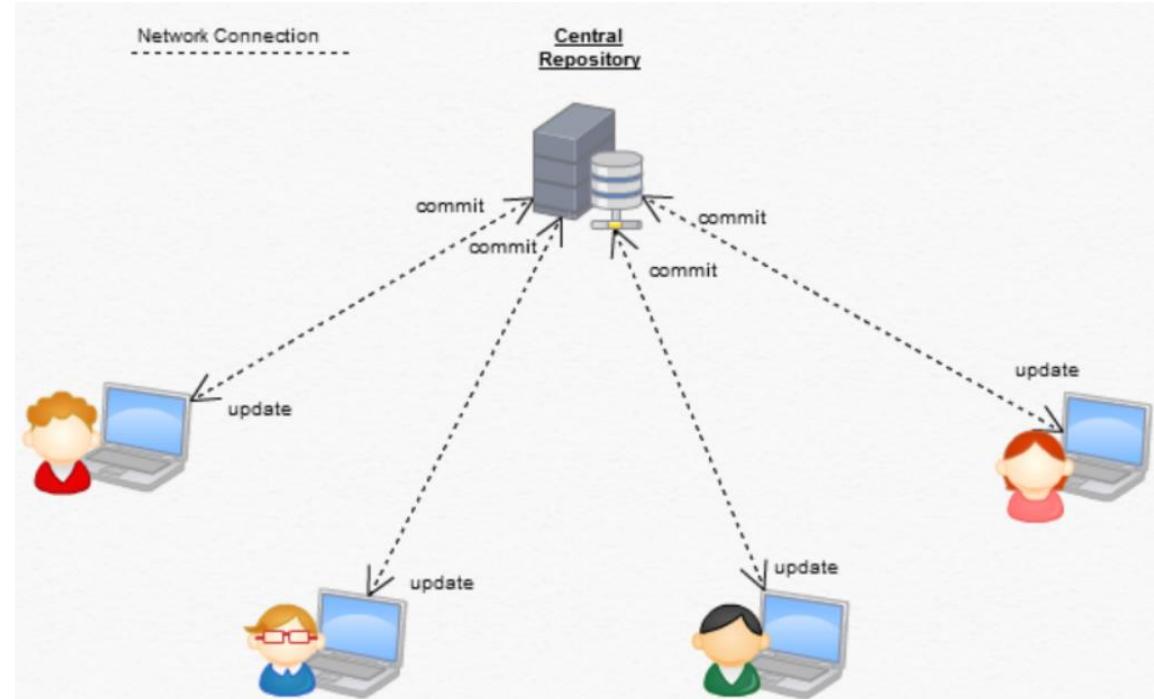


# 버전관리

## 1) Local Computer에서의 버전관리 (한글예시)

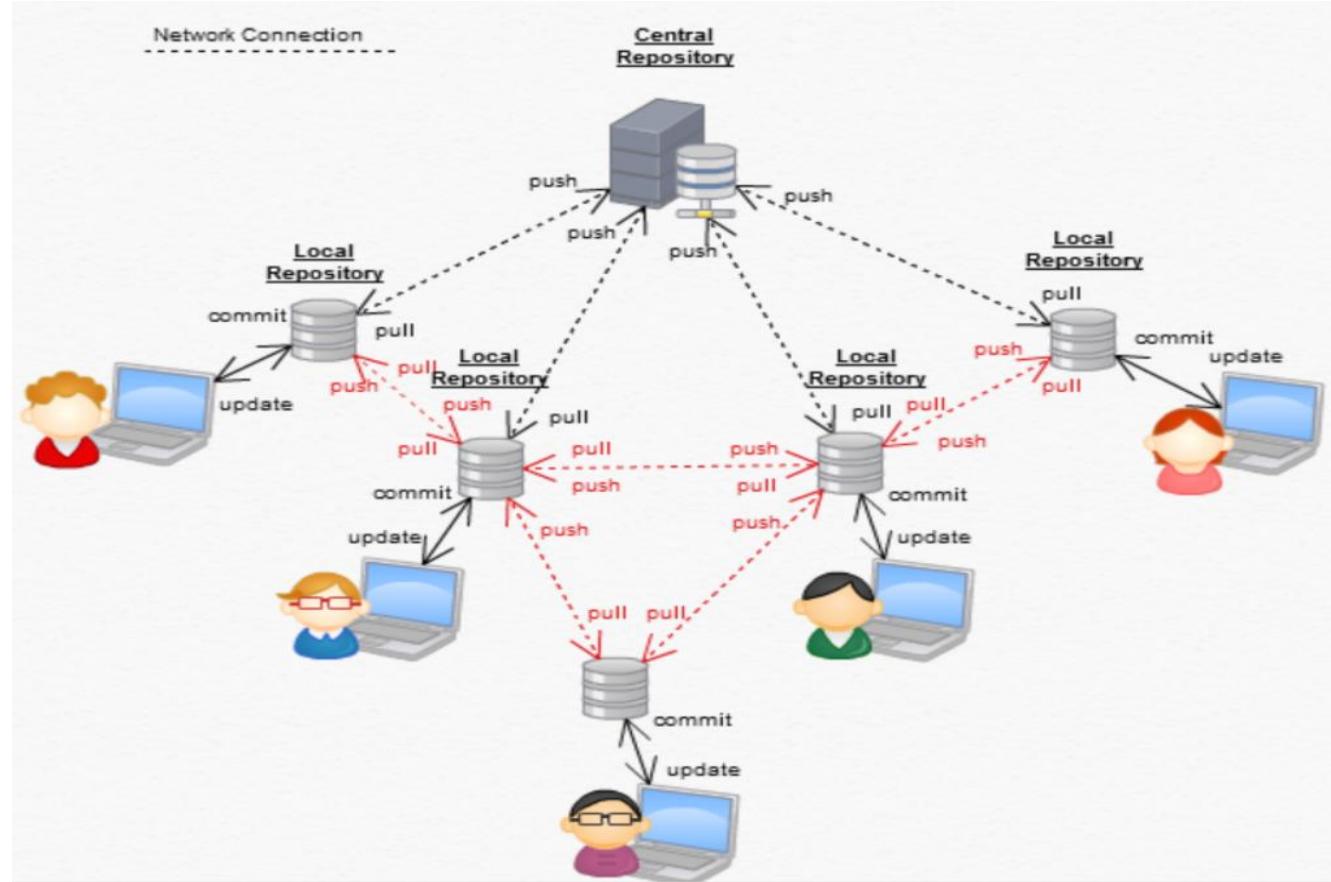


## 2) 중앙집중형 버전관리



# 버전관리

## 3) 분산형 버전관리



# Git은 어떻게 생겨났을까?

- ◆ Linux 운영체계를 개발한 라누스 토발즈 (Linus Torvalds)에 의해 개발
- ◆ Linux는 오픈소스 운영체계이며, 1991~2002년까지 Linux 코드의 유지보수는 압축파일 형식으로 관리
- ◆ 2002년부터 Linux의 코드를 BitKeeper라는 분산버전컨트롤 시스템을 사용하여 관리 시작
- ◆ 2005년 BitKeeper가 유료화됨에 따라 라누스 토발즈는 무료의 분산 버전관리시스템으로 Git을 개발
- ◆ 2008년 GitHub이 개발되어 운영 중



# GitHub의 이용자 현황

- ◆ 이용자: 73백만명 ('21.11월 기준) (우리나라인구 51백만명의 약 1.4배)
- ◆ 온라인 Repository의 개수: 1억개 ('18.11월 기준)
- ◆ 월평균 방문자: 32백만명 ('15.6월 기준)

# GitHub은 누가 이용하고 있을까?

The screenshot shows the GitHub organization profile for DeepMind. At the top, there is a navigation bar with links for Product, Team, Enterprise, Explore, Marketplace, Pricing, a search bar, and sign-in/sign-up options. Below the navigation bar, the DeepMind logo and name are displayed, along with their location (London) and website (http://www.deepmind.com). A pinned repository section follows, featuring dm\_control, sonnet, deepmind-research, acme, dm-haiku, and alphafold. Each repository card includes its name, language (Python or Jupyter Notebook), star count, and fork count. Below this section are tabs for Overview, Repositories (143), Packages, People (21), and Projects.

## Pinned

[dm\\_control](#) Public

DeepMind's software stack for physics-based simulation and Reinforcement Learning environments, using MuJoCo.

● Python ⭐ 2.7k ⚡ 506

[sonnet](#) Public

TensorFlow-based neural network library

● Python ⭐ 9.2k ⚡ 1.3k

[deepmind-research](#) Public

This repository contains implementations and illustrative code to accompany DeepMind publications

● Jupyter Notebook ⭐ 9.9k ⚡ 2k

[acme](#) Public

A library of reinforcement learning components and agents

● Python ⭐ 2.6k ⚡ 323

[dm-haiku](#) Public

JAX-based neural network library

● Python ⭐ 1.8k ⚡ 147

[alphafold](#) Public

Open source code for AlphaFold.

● Python ⭐ 8.1k ⚡ 1.3k

## People



[View all](#)

## Top languages

● Python ● Jupyter Notebook ● Lua  
● C++ ● C

[Repositories](#)

# GitHub은 누가 이용하고 있을까?

GitHub Product Team Enterprise Explore Marketplace Pricing Search Sign in Sign up

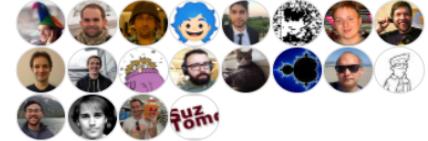
 Google  
Google ❤️ Open Source  
<https://opensource.google/> @GoogleOSS opensource@google.com Verified

Overview Repositories 2.2k Packages People 887 Projects 4

Popular repositories

- material-design-icons** Public  
Material Design icons by Google  
45.4k stars, 9.2k forks
- guava** Public  
Google core libraries for Java  
Java 44k stars, 9.8k forks
- material-design-lite** Public  
Material Design Components in HTML/CSS/JS  
HTML 32k stars, 5.2k forks
- styleguide** Public  
Style guides for Google-originated open-source projects  
HTML 30.2k stars, 11.9k forks
- zx** Public  
A tool for writing better scripts  
JavaScript 30.2k stars, 671 forks
- leveldb** Public  
LevelDB is a fast key-value storage library written at Google that provides an ordered mapping from string keys to string values.  
C++ 28.8k stars, 6.4k forks

People



[View all](#)

Top languages

- Python C++ Go Java
- JavaScript

Most used topics

- android python security java

9

# GitHub은 누가 이용하고 있을까?

GitHub navigation bar: Product ▾ Team Enterprise Explore ▾ Marketplace Pricing ▾ Search Sign in Sign up

## U.S. Geological Survey

By integrating our diverse scientific expertise, we understand complex natural science phenomena and provide scientific products that lead to solutions.

Reston, VA, USA <https://www.usgs.gov/> [gs\\_help\\_git@usgs.gov](mailto:gs_help_git@usgs.gov)

Overview Repositories 238 Packages People 220 Projects

### Popular repositories

- shakemap** Public  
Near-real-time maps of ground motion and shaking intensity  
Python 88 45
- pestpp** Public  
tools for scalable and non-intrusive parameter estimation, uncertainty analysis and sensitivity analysis  
C++ 76 46
- best-practices** Public  
Documents best practices for software development within the U.S. Geological Survey  
JavaScript 61 44
- geobipy** Public  
Geophysical Bayesian Inference in Python. Docs:  
Python 57 13
- libcomcat** Public  
Library of functions and wrapper scripts for accessing ANSS ComCat server
- geomag-algorithms** Public  
Library for processing Geomagnetic timeseries data.

### People

[View all](#)

### Top languages

Python JavaScript Java PHP Fortran

### Most used topics

# GitHub은 누가 이용하고 있을까?

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 U.S. Environmental Protection Agency  
United States of America <http://www.epa.gov>

[Overview](#) [Repositories 317](#) [Packages](#) [People 12](#) [Projects 1](#)

Pinned

 [OneEPA-Standalone-App-Template](#) Public  
Standalone application template for non-www EPA.gov applications  
PLSQL 19 stars 10 forks

 [webcms](#) Public  
The codebase for EPA's updated (D9) WebCMS  
JavaScript 3 stars 3 forks

[Repositories](#)

Type ▾ Language ▾ Sort ▾

 [flowsa](#) Public  
Library that attributes resource use, waste, emissions, and loss to economic sectors



People



Top languages

Python R JavaScript HTML  
Jupyter Notebook

Most used topics

ord oar oms comptox  
epa-unknown

# GitHub은 누가 이용하고 있을까?

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## tensorflow

<http://www.tensorflow.org> [github-admin@tensorflow.org](mailto:github-admin@tensorflow.org)

Overview Repositories 103 Packages People 250 Projects 8

### Pinned

**tensorflow** Public

An Open Source Machine Learning Framework for Everyone

● C++ ⭐ 164k 📈 86.6k

**docs** Public

TensorFlow documentation

● Jupyter Notebook ⭐ 5.2k 📈 4.9k

**community** Public

Stores documents used by the TensorFlow developer community

● TypeScript ⭐ 1.1k 📈 507

### Repositories

Find a repository... Type Language Sort

**docs** Public

TensorFlow documentation

● Jupyter Notebook ⭐ 5,168 📈 4,855 ⏱ 1 ⏵ 9 Updated 6 minutes ago



### People



[View all](#)

### Top languages

Python TypeScript  
Jupyter Notebook C++ Java

### Most used topics

tensorflow machine learning

# GitHub은 누가 이용하고 있을까?

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Search

ageron / handson-ml2 Public

Code Issues 155 Pull requests 2 Actions Projects Wiki Security Insights

master 1 branch 0 tags Go to file Code ▾

ageron Merge pull request #549 from austin-chan/master ... 2d96308 7 days ago 908 commits

.github/ISSUE\_TEMPLATE Remove redundant issue templates 13 months ago

datasets Add Titanic dataset

docker Use printf instead of echo for constant newline handling

images Add breakout.gif

.gitignore Add Titanic dataset

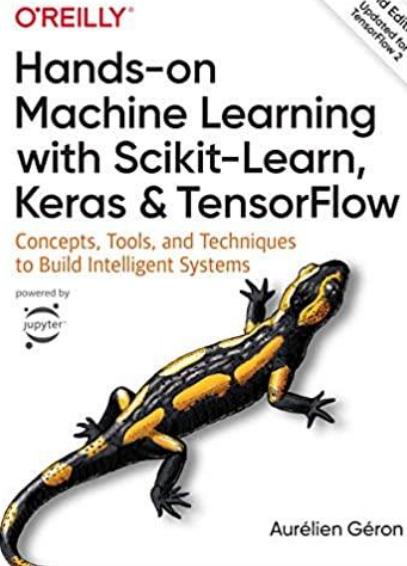
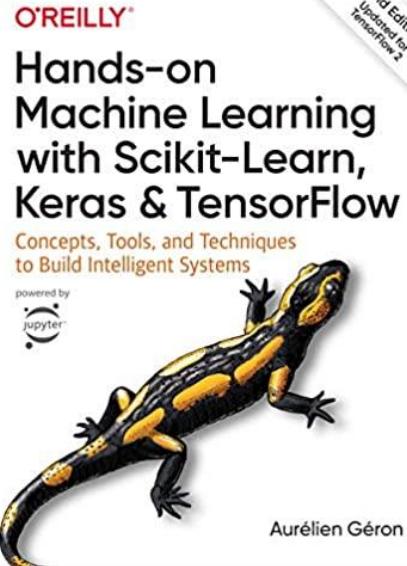
01\_the\_machine\_learning\_landscape.ipynb Reduce polynomial degree from 60 to 30 to avoid infinity error since

02\_end\_to\_end\_machine\_learning\_pr... Set OneHotEncoder's handle\_unknown='ignore' to avoid warnings

03\_classification.ipynb Change preprocessing of categorical attributes in Titanic exercise, f.

04\_training\_linear\_models.ipynb Fix 'Open in Kaggle' link

05\_support\_vector\_machines.ipynb Fix typos in Chapter 5 Exercise 9



Want to play with these notebooks online without having to install anything?

Use any of the following services (I recommend Colab or Kaggle, since they offer free GPUs and TPUs).

**WARNING:** Please be aware that these services provide temporary environments: anything you do will be deleted after a while, so make sure you download any data you care about.

- Open in Colab
- Open in Kaggle
- launch binder
- Launch in Deepnote

Just want to quickly look at some notebooks, without executing any code?

- render nbviewer
- github.com's notebook viewer also works but it's not ideal: it's slower, the math equations are not always displayed correctly, and large notebooks often fail to open.

# GitHub은 누가 이용하고 있을까?

github.com/rickiepark



Haesun Park  
rickiepark

Follow

Just a humble learner :-D

895 followers · 5 following

Seoul, Korea  
<http://tensorflow.blog>  
[@hsunpark](https://twitter.com/@hsunpark)

Achievements



Overview    Repositories 70    Projects    Packages    Stars 22

rickiepark / README.md

Hi Everyone 🎉

[Blog](#) [Twitter](#) [Youtube](#) [LinkedIn](#) [Facebook](#) [GDE](#)

I ❤️ to 📈 about Machine Learning and Deep Learning. Here are repositories for 📁 that I translated or wrote. Just click 🖱 to go the repo.

- 🤖 구글 브레인 팀에게 배우는 딥러닝 with TensorFlow.js ([repo](#), [errata](#)), 길벗, 2022
- 🐍 (개정2판)파이썬 라이브러리를 활용한 머신러닝 ([repo](#), [errata](#)), 한빛미디어, 2022
- 🦋 머신러닝 파워드 애플리케이션 ([repo](#), [errata](#)), 한빛미디어, 2021
- 👉 파이토치로 배우는 자연어 처리 ([repo](#), [errata](#)), 한빛미디어, 2021
- 😺 머신 러닝 교과서 3판 ([video](#), [repo](#), [errata](#)), 길벗, 2021
- 💻 딥러닝 일러스트레이티드 ([repo](#), [errata](#)), 시그마프레스, 2021
- 🎓 혼자 공부하는 머신러닝+딥러닝 ([video](#), [repo](#), [errata](#)), 한빛미디어, 2020
- 🧙 GAN 인 액션 ([repo](#), [errata](#)), 한빛미디어, 2020
- 🐍 핸즈온 머신러닝 2 ([video](#), [repo](#), [errata](#)), 한빛미디어, 2020
- 🖼 미술관에 GAN 딥러닝 ([repo](#), [errata](#)), 한빛미디어, 2019
- 👉 Do It! 딥러닝 ([video](#), [repo](#), [errata](#)), 이지스퍼블리싱, 2019
- 🐍 파이썬을 활용한 머신러닝 쿡북 ([repo](#), [errata](#)), 한빛미디어, 2019
- 😺 머신 러닝 교과서 ([repo](#), [errata](#)), 길벗, 2019
- 🐍 (개정판)파이썬 라이브러리를 활용한 머신러닝 ([repo](#), [errata](#)), 한빛미디어, 2019
- 🐍 케라스 창시자에게 배우는 딥러닝 ([repo](#), [errata](#)), 길벗, 2018
- 🐍 핸즈온 머신러닝 ([repo](#), [errata](#)), 한빛미디어, 2018
- 🐍 파이썬 라이브러리를 활용한 머신러닝 ([repo](#), [errata](#)), 한빛미디어, 2017
- 🧠 텐서플로 첫걸음 ([repo](#), [errata](#)), 한빛미디어, 2016

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# GitHub은 누가 이용하고 있을까?

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Search / Sign in Sign up

rickiepark/handson-ml2 Public

forked from ageron/handson-ml2

Notifications Fork 9.9k ⭐

Code Issues 3 Pull requests Discussions Security Insights

master 2 branches 0 tags Go to file Code ▾

This branch is 251 commits ahead, 329 commits behind ageron/handson-ml2:master. Contribute ▾

rickiepark 주피터 노트북 뷰어 아이콘 변경 9e63503 on Feb 6 830 commits

datasets 타이타닉 데이터셋 추가 14 months ago

docker 도커 리드미 수정 11 months ago

images Add breakout.gif 3 years ago

.gitignore Add jsb\_chorales dataset to .gitignore 2 years ago

01\_the\_machine\_learning\_landscape.ipynb 사이킷런 1.0에서 재실행 5 months ago

02\_end\_to\_end\_machine\_learning\_pr... 노트북 재실행 5 months ago

03\_classification.ipynb 노트북 재실행 5 months ago

04\_training\_linear\_models.ipynb 노트북 재실행 5 months ago

About

핸즈온 머신러닝 2/E의 주피터 노트북

tensorflow.blog/handson-ml2

python machine-learning deep-learning  
neural-network tensorflow scikit-learn  
keras hands-on-machine-learning

Readme Apache-2.0 License

386 stars 21 watching 9.9k forks

Releases No releases published

# K-water AI Lab

Search or jump to... / Pull requests Issues Marketplace Explore



Overview Repositories 6 Projects Packages Stars

Popular repositories

- [algae\\_monitoring](#) Public  
Python ⭐ 1
- [rainfall\\_distribution\\_using\\_satellites](#) Public
- [colab\\_examples](#) Public  
Jupyter Notebook ⭐ 1 ⚡ 1

Customize your pins

Kwater-AILab

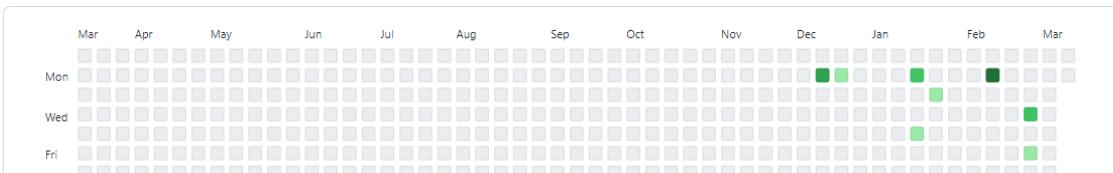
Kwater-AILab

Edit profile

3 followers · 1 following

32 contributions in the last year

Contribution settings ▾



Less More

Learn how we count contributions

# 실습

# 금일의 Git과 GitHub의 활용 학습 목표

## ■ 자신이 개발한 코드를 어떻게 관리할 것인가?

- 팀원들과 어떻게 공유하며 협업을 할 것인가?

## ■ 다른 개발자들이 개발한 코드를 어떻게 활용할 것인가?

- 과연 개발자들이 순수하게 자신이 개발해서 사용하는 코드가 몇%가 될까요?
- 당연히 많지 않을 것이며, 개발된 프로그램(소스코드)를 어떻게 본인의 프로젝트에 잘 활용하는지가 중요

# 1. Anaconda 설치



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Individual Edition is now

## ANACONDA DISTRIBUTION

The world's most popular open-source Python distribution platform

### Anaconda Distribution

Download



For Windows

Python 3.9 • 64-Bit Graphical Installer • 510 MB

Get Additional Installers



### Open Source

Access the open-source software you need for projects in any field, from data visualization to robotics.



### User-friendly

With our intuitive platform, you can easily search and install packages and create, load, and switch between environments.



### Trusted

Our securely hosted packages and artifacts are methodically tested and regularly updated.

## 2. Git 설치

<https://git-scm.com/downloads>



# git --distributed-is-the-new-centralized

Search entire site...

[About](#)

[Documentation](#)

**Downloads**

[GUI Clients](#)

[Logos](#)

[Community](#)

The entire [Pro Git book](#) written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

## Downloads

macOS Windows Linux/Unix

Older releases are available and the Git source repository is on GitHub.

### GUI Clients

Git comes with built-in GUI tools (`git-gui`, `gitk`), but there are several third-party tools for users looking for a platform-specific experience.

[View GUI Clients →](#)

### Git via Git

If you already have Git installed, you can get the latest development version via Git itself:

```
git clone https://github.com/git/git
```

You can also always browse the current contents of the git repository using the [web interface](#).

### Latest source Release

**2.35.1**  
[Release Notes \(2022-01-29\)](#)

[Download for Windows](#)

### Logos

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.

[View Logos →](#)

</> About this site  
Patches, suggestions, and comments are welcome.

Git is a member of Software Freedom Conservancy

# 2. Git bash에서 conda activate 하기

- Anaconda에서 “Anaconda Prompt” 실행하기

```
$ conda init bash
```

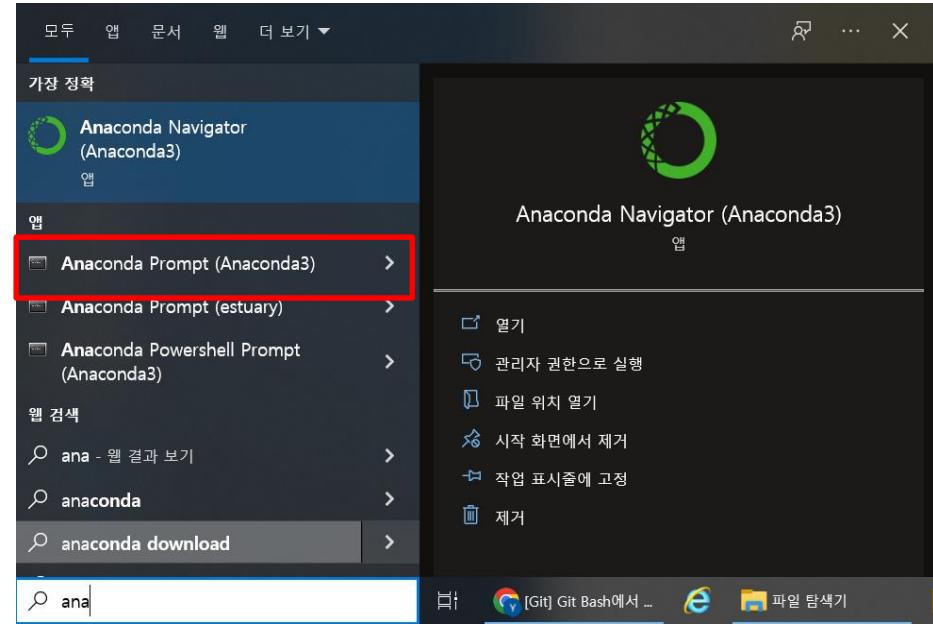
- GitBash 실행하기

```
$ echo '. ${HOME}/.bash_profile' >> ~/.bashrc
```

- GitBash 재실행하기: (base) 확인

```
MINGW64:/c/Users/kwater
```

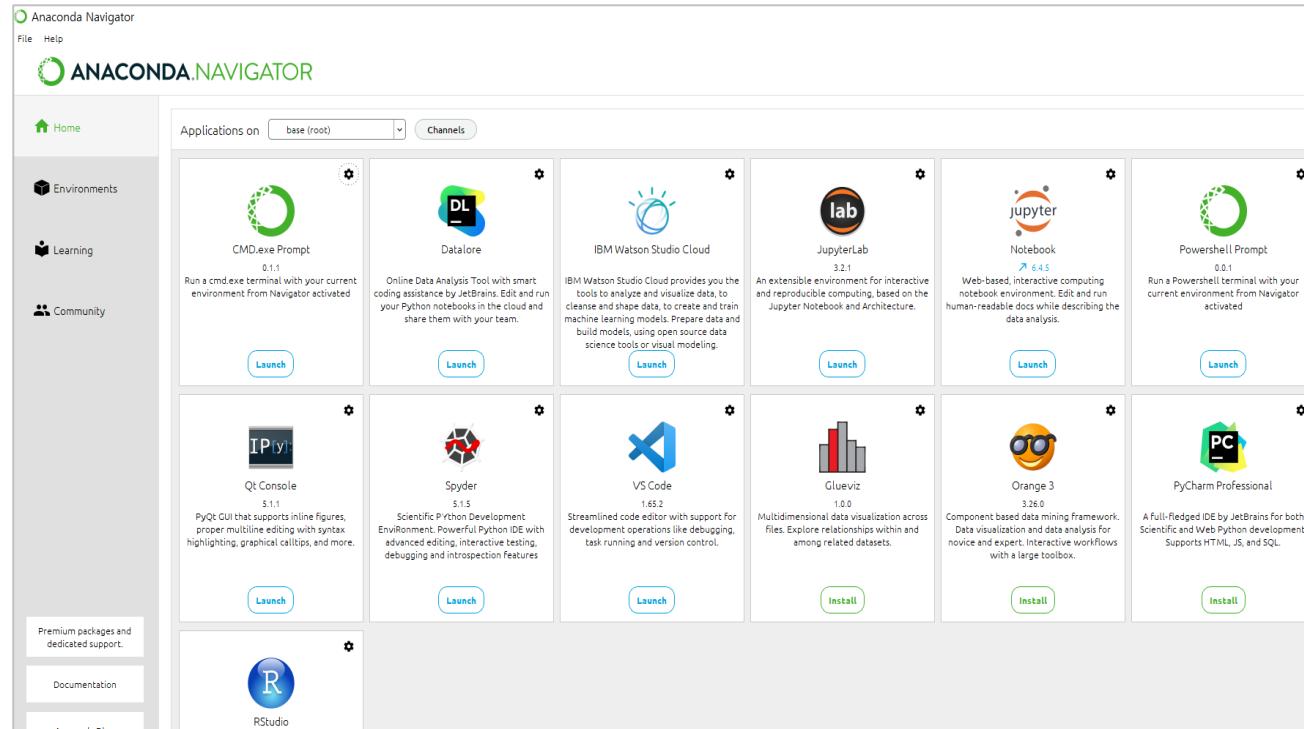
```
(base)
kwater@kwater MINGW64 ~
$ |
```



- Anaconda에서 Environment 확인하기

# Anaconda의 유용한 기능

- 아나콘다는 Python이나 R 등의 활용을 위한 다양한 패키지를 포함하여 제공되는 환경
- 또한, 파이썬의 가상환경을 효율적으로 관리할 수 있는 기능을 제공함



### 3. Git의 작업영역에 대한 이해

- (Working Directory) 개인 Local Computer에 Source코드를 관리하는 폴더
- (Staging Area) Working Directory의 변화사항을 Repository에 보내기 전에 저장하는 공간
- (Repository) GitHub



# 4. Git 기본기능 - 개인 작업 위주

## 4.1 GitHub에서 새로운 Repository 만들기

The screenshot shows a GitHub user profile for 'YoungDon Choi'. The profile includes a large circular profile picture of a man with glasses, a bio section mentioning 'Manager in K-water(Korea Water Resources Corporation) Ph.D Student, Universtiy of Virginia.', and a 'Edit profile' button. Below the profile picture, it says '2 followers · 3 following'. At the top of the page, there is a navigation bar with links for 'Search or jump to...', 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. To the right of the navigation bar, there is a dropdown menu with options: 'New repository' (which is highlighted with a red box), 'Import repository', 'New gist', 'New organization', and 'New project'.

New repository

- Import repository
- New gist
- New organization
- New project

YoungDon Choi  
DavidChoi76

Manager in K-water(Korea Water Resources Corporation) Ph.D Student, Universtiy of Virginia.

Edit profile

2 followers · 3 following

New repository

- Import repository
- New gist
- New organization
- New project

summa Public  
Forked from CH-Earth/summa  
Structure for Unifying Multiple Modeling Alternatives:  
Fortran

mizuRoute Public  
Forked from ESCOMP/mizuRoute  
NCAR/RAL streamflow routing model  
Fortran

Jupyter-xsede Public  
Forked from cyberiris/jupyter-xsede  
Python

MetSim Public  
Forked from UW-Hydro/MetSim  
Meteorology Simulator  
Python

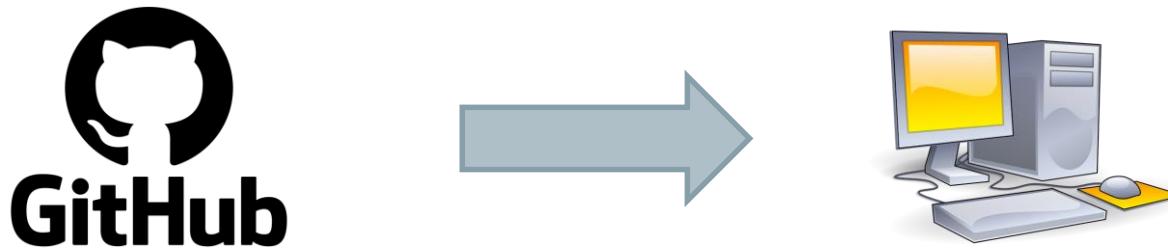
pyrhessys Public  
Forked from uva-hydroinformatics/pyRHESSys  
Python Model API for RHESSys (The Regional Hydro-Ecologic Simulation System) model  
R 1

pysumma Public  
Forked from UW-Hydro/pysumma  
Python module for managing SUMMA simulations  
Python

<https://github.com/new>

## 4.2 GitHub의 새로 만든 Repository에서 Local Computer로 자료 받기

```
$ git clone {GitHub_Repository_Name}
```



## 4.3 Local Computer에서 GitHub repository와의 연결여부 확인

- 1) 다운받은 폴더로 이동하여 Git을 실행하여 연다
- 2) Git bash에 main or master branch가 나타나는지 확인한다

4.4 파일을 추가 또는 수정한 후, Git에서 파일의 변경여부를 확인한다.

```
$ git status
```

4.5 작업이 종료되면 GitHub repository에 추가하고자 하는 파일을 단계별로 업로드 한다.

```
$ git add {파일명}
```

```
$ git commit -m "{Description}"
```

```
$ git push
```

4.6 GitHub repository에서 추가된 파일을 확인한다.

4.7 GitHub repository의 설명을 위해서 README파일 수정하기

4.8 GitHub repository에서 개발한 코드를 Release하기

# Semantic Versioning 2.0.0

## Summary

Given a version number MAJOR.MINOR.PATCH, increment the:

1. MAJOR version when you make incompatible API changes,
2. MINOR version when you add functionality in a backwards compatible manner, and
3. PATCH version when you make backwards compatible bug fixes.

Additional labels for pre-release and build metadata are available as extensions to the **MAJOR.MINOR.PATCH** format.

# 5. Git 기본기능 - 개발된 GitHub 활용하기 (Python위주로)

## 5.1 algae monitoring Kwater-AILab repository를 나의 repository로 가져오기

\* GitHub에 본인계정으로 Log in 여부 확인 필요

fork

Kwater-AILab / algae\_monitoring Public

Code Issues Pull requests 1 Actions Projects Wiki Security Insights

main 1 branch 1 tag Go to file Add file Code

Kwater-AILab Update README.md d72c169 13 days ago 21 commits

data update notebook and data 15 days ago

notebooks update notebook for visualization 15 days ago

pyalgae\_ai change the location of results to merge result for each simulation 23 days ago

README.md Update README.md 13 days ago

postbuild add postbuild to install pyalgae in Binder 29 days ago

setup.cfg add setup.cfg and changed the folder name 2 months ago

setup.py add seaborn library for visualization 15 days ago

versioneer.py add setup.cfg and changed the folder name 2 months ago

README.md

About No description, website, or topics provided.

Readme

2 stars

1 watching

2 forks

Releases 1 tags

Packages No packages published

Languages

5.2 \$ git clone {repository\_url} 을 통해 repository의 코드를 local computer로 다운받기

# 5. Git 기본기능 - 개발된 GitHub 활용하기 (Python위주로)

- ✓ local compute에서 python 환경 Setting하기 (setup.py)

```
import versioneer
from setuptools import setup, find_packages

setup(name='pyalgae_ai',
      version=versioneer.get_version(),
      cmdclass=versioneer.get_cmdclass(),
      description='A python library to analyze algae on reservoirs using Sentinel-2 and machine learning',
      url='https://github.com/Kwater-AILab/algae_prediction.git',
      author='JiYoung Jung, HyunJun Jang, YoungDon Choi',
      author_email='choiyd1115@gmail.com',
      license='MIT',
      packages=find_packages(),
      install_requires=[  
        'tensorflow',  
        'xgboost',  
        'pandas',  
        'matplotlib',  
        'dask',  
        'distributed',  
        'toolz',  
        'sklearn',  
        'matplotlib',  
        'iohlib'  
    ]
```

setup.py가 있을 경우

\$ pip install .

or

\$ python setup.py install

# 5. Git 기본기능 - 개발된 GitHub 활용하기 (Python위주로)

- ✓ local compute에서 python 환경 Setting하기 (requirements.txt)

```
##### Core scientific packages
jupyter==1.0.0
matplotlib==2.2.2
numpy==1.14.5
pandas==0.22.0
scipy==1.1.0

##### Machine Learning packages
scikit-learn==0.19.1

# Optional: the XGBoost library is only used in the ensemble learning chapter.
#xgboost==0.71

##### Deep Learning packages

# Replace tensorflow with tensorflow-gpu if you want GPU support. If so,
# you need a GPU card with CUDA Compute Capability 3.0 or higher support, and
# you must install CUDA, cuDNN and more: see tensorflow.org for the detailed
# installation instructions.
tensorflow==1.10.0
#tensorflow-gpu==1.10.0
```

Requirements.txt가 있을 경우

```
$ pip install -r requirements.txt
```

# 5. Git 기본기능 - 개발된 GitHub 활용하기 (Python위주로)

- ✓ local compute에서 python 환경 Setting하기 (environment.yml)

```
name: pysumma
channels:
  - conda-forge
dependencies:
  - python>=3.6
  - xarray>=0.15.0
  - pandas
  - netcdf4>=1.2.5
  - numpy>=1.11.2
  - dask
  - distributed
  - toolz
  - pytest
  - fiona
  - cartopy
  - shapely
  - seaborn
  - matplotlib
  - geopandas
  - pandas
  - jupyter
```

Requirements.txt가 있을 경우

```
$ conda env create -f environment.yml
```

# pypi로부터 python library 설치하기

<https://pypi.org/>

Find, install and publish Python packages with the Python Package Index

Search projects

Or browse projects

366,000 projects    3,339,843 releases    5,813,311 files    582,050 users



The Python Package Index (PyPI) is a repository of software for the Python programming language.

PyPI helps you find and install software developed and shared by the Python community. [Learn about installing packages](#).

Package authors use PyPI to distribute their software. [Learn how to package your Python code for PyPI](#).

pandas2 0.0.0

`pip install pandas2`

Released: Sep 19, 2017

Navigation

Project description

Placeholder for pandas2

Release history

Download files

Project links

Homepage

Statistics

Github statistics:

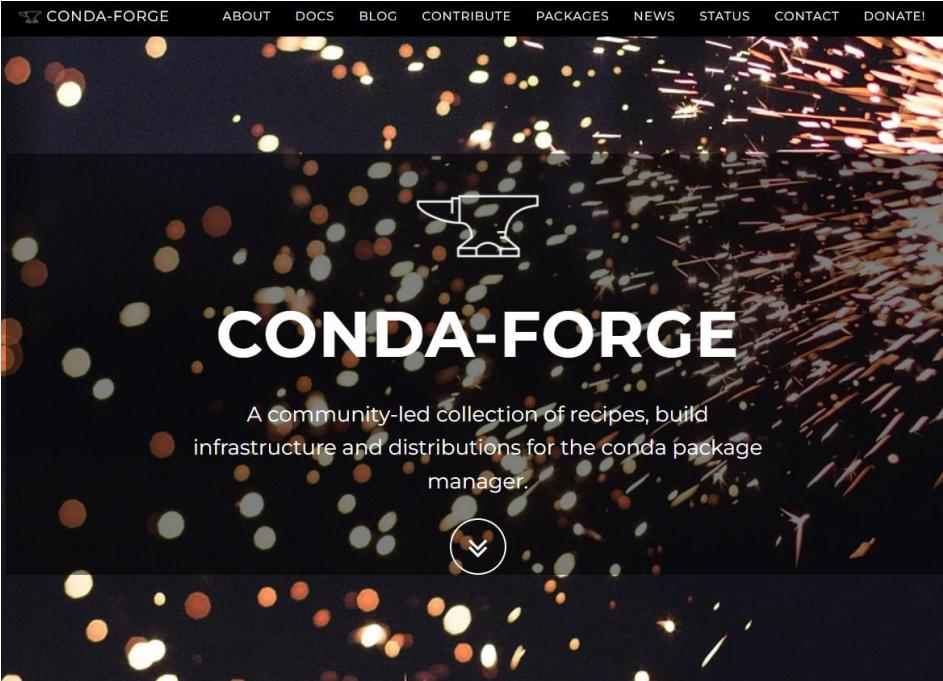
Stars: 297

Pandas 예시

\$ pip install pandas2

# Conda-forge로부터 conda library 설치하기

<https://github.com/conda-forge>



The screenshot shows the GitHub repository page for "conda-forge". The header includes the repository name, a brief description ("A community led collection of recipes, build infrastructure and distributions for the conda package manager."), and links for Overview, Repositories (15.8k), Packages, People (411), and README.md (Public). The main content area starts with a "Hi there" message and a list of important git repositories. It also features sections for Popular repositories (miniforge, staged-recipes) and developer statistics (Top languages: Shell, Batchfile, Python, CMake, C; Most used topics: hacktoberfest, conda-forge; Developer Program Member badge). On the right side, there are sections for People (a grid of user profiles) and Report abuse.

# 5. Git 기본기능 - 개발된 GitHub 활용하기 (Python위주로)

5.3 setup.py에서 spatial analysis관련 파일 썬 라이브러리 삭제하기

5.4 \$ pip install . 을 활용하여 local compute에 algae\_monitoring 라이브러리 설치

5.5 Anaconda에서 Jupyter notebook 설치하기

5.6 Git bash에서 \$ jupyter notebook 을 활용하여 Jupyter notebook 열기

5.7 Jupyter notebook을 열어서 실행하기

# 6. Git 기본기능 - 협업하기

6.1 Local computer에서 update된 사항을 Original GitHub repository로 수정요청하기

- pull request를 이용하여 update한 코드를 보내기

6.2 Original GitHub repository에서 update된 코드를 나의 계정에 Fork된 repository로 반영하기

- 동일하게 pull request를 이용하여 update된 코드를 받기

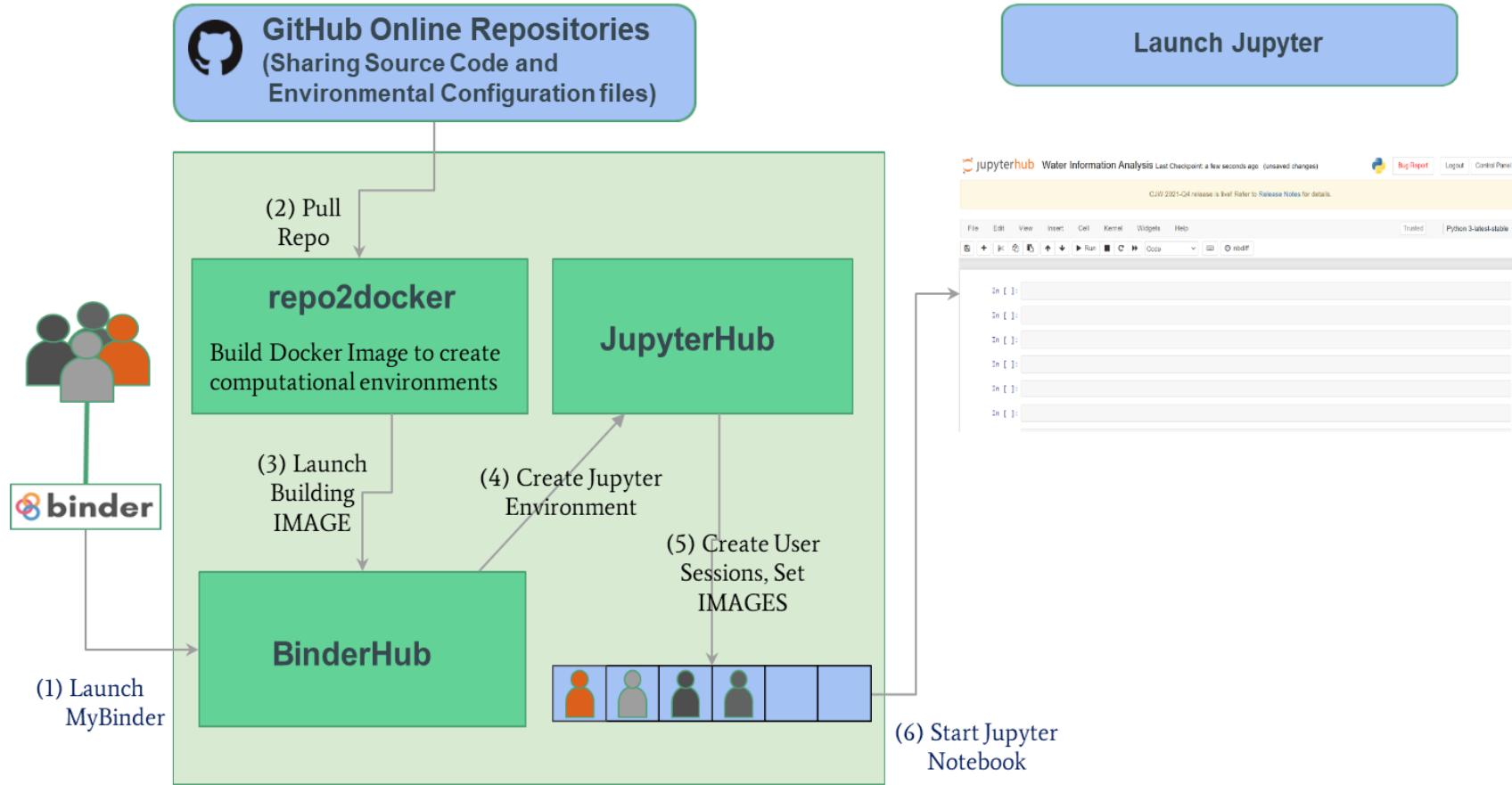
# 7. Binder 이해하기

지금까지 requirements.txt, setup.py, environment.yml 등의 Configuration파일들에 대해서 배웠기 때문에 GitHub의 repository를 활용하여 Binder를 실행하는 것은 어렵지 않음

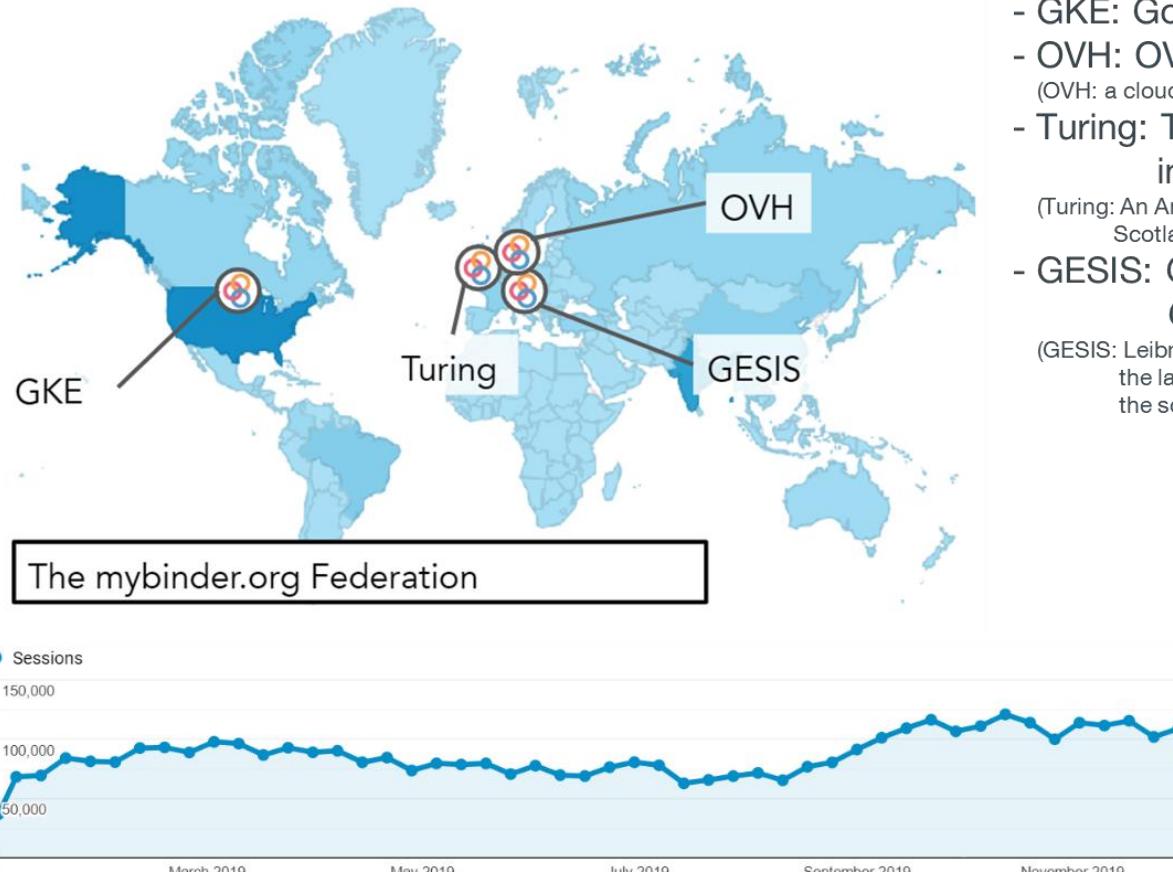


- ◆ ① Online Repositories, ② Docker, ③ JupyterHub 환경을 연계하여 Cloud기반의 무료분석 Jupyter 환경제공 플랫폼
  - (Online Repositories) Binder에서는 분석환경 생성 Configuration 파일의 공유를 위해 GitHub, HydroShare, Harvard Dataverse, FigShare, Zenodo 등의 온라인 저장소 활용
  - (Docker) repo2Docker 라이브러리를 통해 온라인 저장소의 Configuration파일을 활용하여 분석환경 생성 · 제공
  - (JupyterHub) Online Repositories에 의해 공유된 데이터와 Docker를 통해서 개발된 분석환경을 Cloud기반에서 Jupyter환경을 통한 User Interface를 제공

# 7. Binder 이해하기



# 7. Binder 이해하기



- GKE: Google Cloud Platform
- OVH: OVH Platform in France  
(OVH: a cloud hosting company based in Europe)
- Turing: Turing Institute Platform in Scotland  
(Turing: An Artificial Intelligence laboratory based in Scotland)
- GESIS: GESIS Platform in German  
(GESIS: Leibniz Institute for the Social Sciences is the largest German infrastructure institute for the social sciences)

# 7. Git을 활용한 Binder 실행하기

- ✓ Configuration 작성 및 GitHub repository에 공유 (binder 폴더로도 이용가능)

The screenshot shows a GitHub repository page for 'Kwater-AI Lab / algae\_monitoring'. The repository is public. The commit history lists several commits, with one commit's file, 'setup.py', highlighted by a red box. The repository details sidebar shows 2 stars, 1 watching, and 2 forks. The README.md file contains instructions for using the repository with GitHub Online Repository and JupyterLab.

Kwater-AI Lab / algae\_monitoring Public

Code Issues Pull requests 1 Actions Projects Wiki Security Insights

main 1 branch 1 tag Go to file Add file Code

Kwater-AI Lab Update README.md d72c169 13 days ago 21 commits

data update notebook and data 15 days ago

notebooks update notebook for visualization 15 days ago

pyalgae\_ai change the location of results to merge result for each simulation 23 days ago

README.md Update README.md 13 days ago

postbuild add postbuild to install pyalgae in Binder 29 days ago

setup.cfg add setup.cfg and changed the folder name 2 months ago

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versioneer.py add setup.cfg and changed the folder name 2 months ago

About No description, website, or topics provided.

Readme 2 stars 1 watching 2 forks

Releases 1 tags

Packages No packages published

Languages Python 81.0% Jupyter Notebook 19.0%

README.md

## algae monitoring

본 GitHub Online Repository에서는 Sentinel-2 위성영상을 활용하여 저수지의 녹조를 분석하는 Python code와 실행을 위한 Jupyter notebook을 개발 공유합니다.

- 먼저 아래의 "launch binder"를 클릭해주세요.

launch binder

- 잠시후 JupyterLab이 실행되면, notebooks 폴더에서 Jupyter Notebook 파일을 실행해서 절차에 따라서 Python 코드를 실행하세요

# 7. Git을 활용한 Binder 실행하기

- ✓ Binder에서 지원하는 Configuration 파일의 종류 (웹사이트에서 확인 가능)

The screenshot shows a web browser displaying the 'binder user guide' at [mybinder.readthedocs.io/en/latest/using/config\\_files.html](https://mybinder.readthedocs.io/en/latest/using/config_files.html). The page title is 'Configuration Files'. The left sidebar has a search bar and links to 'Configuration Files' and 'Example repositories'. The main content area starts with a note about 'repo2docker' looking for configuration files in the repository. It then lists supported configuration files: 'environment.yml', 'Pipfile' or 'Pipfile.lock', 'requirements.txt', 'setup.py', 'Project.toml', 'REQUIRE', 'install.R', 'apt.txt', 'DESCRIPTION', 'postBuild', 'start', 'runtime.txt', 'default.nix', and 'Dockerfile'. A 'Note' section explains that 'environment.yml' is used by Conda, while 'repo2docker' uses its own environment file. A 'Warning' section notes that Python version support is best with Python 3.7, 3.6, 3.5, and 2.7. A sidebar on the right provides links to these specific files. At the bottom, there's a 'Let's Talk Docs' sidebar with a subscribe button.

Configuration Files

`repo2docker` looks for configuration files in the repository being built to determine how to build it. In general, `repo2docker` uses the same configuration files as other software installation tools, rather than creating new custom configuration files.

A number of `repo2docker` configuration files can be combined to compose more complex setups.

The binder examples organization on GitHub contains a list of sample repositories for common configurations that `repo2docker` can build with various configuration files such as Python and R installation in a repository.

A list of supported configuration files (roughly in the order of build priority) can be found on this page (and to the right).

## environment.yml - Install a conda environment

`environment.yml` is the standard configuration file used by `conda` that lets you install any kind of package, including Python, R, and C/C++ packages. `repo2docker` does not use your `environment.yml` to create and activate a new conda environment. Rather, it updates a base conda environment defined here with the packages listed in your `environment.yml`. This means that the environment will always have the same default name, not the name specified in your `environment.yml`.

**Note**

You can install files from pip in your `environment.yml` as well. For example, see the [binder-examples](#) `environment.yml` file.

You can also specify which Python version to install in your built environment with `environment.yml`. By default, `repo2docker` installs `[default_python]` with your `environment.yml` unless you include the version of Python in this file. `conda` supports all versions of Python, though `repo2docker` support is best with Python 3.7, 3.6, 3.5 and 2.7.

**Warning**

On this page

- `environment.yml` - Install a conda environment
- `Pipfile` and/or `Pipfile.lock` - Install a Python environment
- `requirements.txt` - Install a Python environment
- `setup.py` - Install Python packages
- `Project.toml` - Install a Julia environment
- `REQUIRE` - Install a Julia environment (legacy)
- `install.R` - Install an R/RStudio environment
- `apt.txt` - Install packages with apt-get
- `DESCRIPTION` - Install an R package
- `postBuild` - Run code after installing the environment
- `start` - Run code before the user sessions starts
- `runtime.txt` - Specifying runtimes
- `default.nix` - the nix package manager
- `Dockerfile` - Advanced environments

Edit this page

# 7. Git을 활용한 Binder 실행하기

mybinder.org

- ✓ MyBinder User Interface

The screenshot shows the MyBinder user interface. At the top is the MyBinder logo, which consists of three overlapping circles in orange, pink, and blue, followed by the word "binder" in a bold, lowercase sans-serif font.

The main heading reads: "Turn a Git repo into a collection of interactive notebooks". Below this, a subtext explains: "Have a repository full of Jupyter notebooks? With Binder, open those notebooks in an executable environment, making your code immediately reproducible by anyone, anywhere." A link "New to Binder? Get started with a Zero-to-Binder tutorial in Julia, Python, or R." is provided.

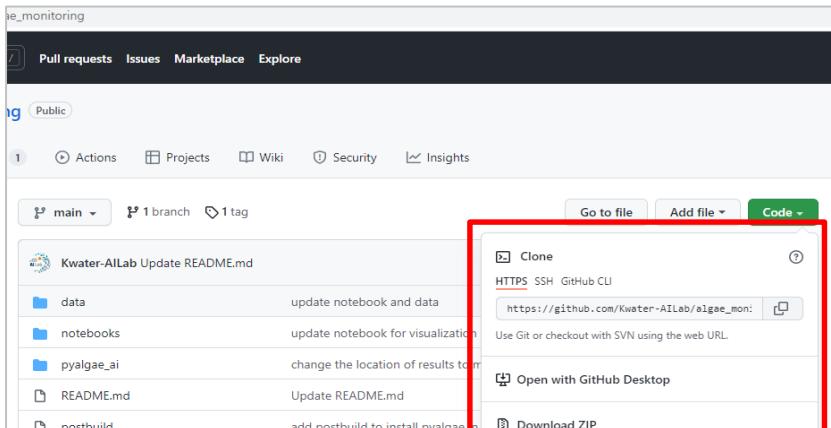
A large grey callout box contains the following fields:

- "Build and launch a repository"
- "GitHub repository name or URL" input field with a dropdown menu showing "GitHub" and "Bitbucket".
- "Git ref (branch, tag, or commit)" input field containing "HEAD".
- "Path to a notebook file (optional)" input field.
- "File" dropdown menu.
- "launch" button.

At the bottom of the callout box is a link: "Copy the URL below and share your Binder with others:".

# 7. Git을 활용한 Binder 실행하기

- ✓ Repository URL을 MyBinder에 복사



ie\_monitoring

Pull requests Issues Marketplace Explore

Public

Actions Projects Wiki Security Insights

main 1 branch 1 tag

Kwater-AILab Update README.md

data update notebook and data

notebooks update notebook for visualization

pyalgae\_ai change the location of results to run

README.md Update README.md

postbuild add postbuild to install pyalgae in

setup.cfg add setup.cfg and changed the folder name

setup.py add seaborn library for visualization

versioneer.py add setup.cfg and changed the folder name

2 months ago

15 days ago

2 months ago

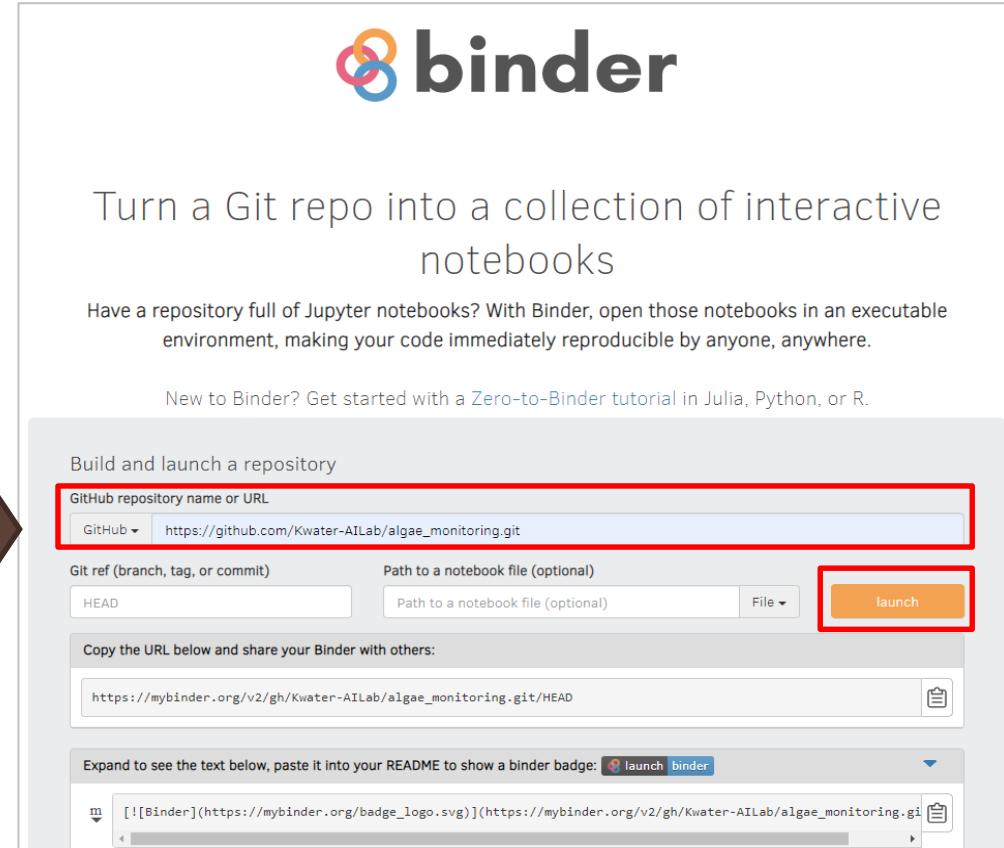
README.md

## algae monitoring

본 GitHub Online Repository에서는 Sentinel-2 위성영상을 활용하여 저수지의 녹조를 분석하는 Python code와 실행을 위한 Jupyter notebook을 개발 공유합니다.

- 먼저 아래의 "launch binder"를 클릭해주세요.
- 잠시후 JupyterLab이 실행되면, notebooks 폴더에서 Jupyter Notebook 파일을 실행해서 절차에 따라서 Python 코드를 실행해주세요

[launch binder](#)



binder

Turn a Git repo into a collection of interactive notebooks

Have a repository full of Jupyter notebooks? With Binder, open those notebooks in an executable environment, making your code immediately reproducible by anyone, anywhere.

New to Binder? Get started with a [Zero-to-Binder tutorial](#) in Julia, Python, or R.

Build and launch a repository

GitHub repository name or URL

GitHub [https://github.com/Kwater-AILab/algae\\_monitoring.git](https://github.com/Kwater-AILab/algae_monitoring.git)

Git ref (branch, tag, or commit)

HEAD

Path to a notebook file (optional)

Path to a notebook file (optional) File [launch](#)

Copy the URL below and share your Binder with others:

[https://mybinder.org/v2/gh/Kwater-AILab/algae\\_monitoring.git/HEAD](https://mybinder.org/v2/gh/Kwater-AILab/algae_monitoring.git/HEAD)

Expand to see the text below, paste it into your README to show a binder badge: [launch binder](#)

# 7. Git을 활용한 Binder 실행하기

- ✓ Repository에 Badge 생성하기

The screenshot shows a GitHub repository interface. In the top right corner of the main content area, there is a button labeled "launch binder". A red box highlights this button. Below it, the README file contains the following text:

```
Expand to see the text below, paste it into your README to show a binder badge: [ launch binder ]  
m [ ![Binder](https://mybinder.org/badge_logo.svg)](https://mybinder.org/v2/gh/Kwater-AILab/algae_monitoring.git/HEAD)  
  
.rst .. image:: https://mybinder.org/badge_logo.svg  
:target: https://mybinder.org/v2/gh/Kwater-AILab/algae_monitoring.git/HEAD
```

Below the README, there is a "Waiting" progress bar followed by a "Building" bar. Underneath, a "Build logs" section displays the following command-line output:

```
1 (2.0 MB)  
Collecting pyproj>=2.2.0  
  Downloading pyproj-3.2.1-cp37-cp37m-manylinux2010_x86_64.whl (6.3 MB)  
Requirement already satisfied: pytz>=2017.3 in /srv/conda/envs/notebook/lib/python3.7/site-packages (from pandas>pyalgal-ai==0.1.0+1.gd72c169) (2017.3)  
Requirement already satisfied: python-dateutil>=2.7.3 in /srv/conda/envs/notebook/lib/python3.7/site-packages (from pandas>pyalgal-ai==0.1.0+1.gd72c169) (2.8.2)  
Collecting kiwisolver>=1.0.1  
  Downloading kiwisolver-1.4.2-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.whl (1.1 MB)  
Requirement already satisfied: pyparsing>=2.2.1 in /srv/conda/envs/notebook/lib/python3.7/site-packages (from matplotlib>pyalgal-ai==0.1.0+1.gd72c169) (3.0.7)  
Collecting cycler>=0.10  
  Downloading cycler-0.11.0-py3-none-any.whl (6.4 kB)  
Collecting pillow>=6.2.0  
  Downloading Pillow-9.0.1-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (4.3 MB)  
Collecting fonttools>=4.22.0  
  Downloading fonttools-4.31.2-py3-none-any.whl (899 kB)  
Collecting scipy>=1.0  
  Downloading scipy-1.7.3-cp37-cp37m-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (38.1 MB)
```

The screenshot shows a GitHub repository named "algae\_monitoring" with a public status. The repository has one branch ("main") and one tag. On the right side, there is a "Code" dropdown menu with options like "Clone", "HTTPS", "SSH", and "GitHub CLI". Below the code dropdown, there is a "Download ZIP" button. The repository's README file is titled "algae monitoring". The README content includes the following text:

본 GitHub Online Repository에서는 Sentinel-2 위성영상 활용하여 저수지의 녹조를 분석하는 Python code와 실행을 위한 Jupyter notebook을 개발 공유합니다.

- 먼저 아래의 "launch binder"를 클릭해주세요.
- 실행되면, notebooks 폴더에서 Jupyter Notebook 파일을 실행해서 절차에 따라서 Python 코드를 실행하세요

A red box highlights the "launch binder" button in the README file.

# 1. algae\_monitoring Binder 실행하기

# 2. Hands-On Machine Learning with Scikit-Learn, Keras & Tensorflow Binder 실행하기

The screenshot shows a GitHub repository page for 'handson-ml2'. The top navigation bar includes links for Product, Team, Enterprise, Explore, Marketplace, Pricing, Search, Sign in, and Sign up. The repository details show it's a Public fork from 'ageron/handson-ml2'. It has 3 issues, 2 pull requests, 0 discussions, 0 security vulnerabilities, and 0 insights. The 'Code' tab is selected. The repository stats show 'master' branch, 2 branches, 0 tags, 251 commits ahead, and 329 commits behind 'ageron/handson-ml2:master'. There are buttons for 'Go to file' and 'Code'. The 'About' section links to '핸즈온 머신러닝 2/E의 주피터 노트북' and 'tensorflow.blog/handson-ml2'.

rickiepark / handson-ml2 Public  
forked from ageron/handson-ml2

Code Issues 3 Pull requests Discussions Security Insights

master 2 branches 0 tags Go to file Code About

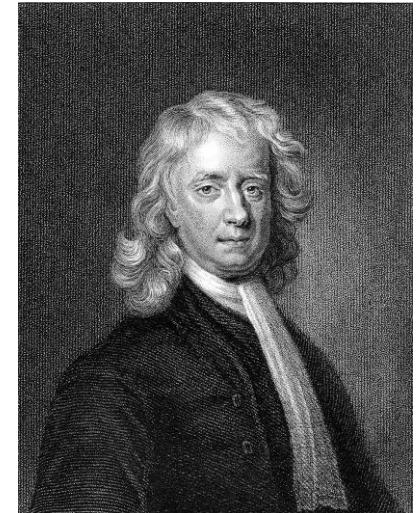
This branch is 251 commits ahead, 329 commits behind ageron/handson-ml2:master.

Contribute

핸즈온 머신러닝 2/E의 주피터 노트북  
tensorflow.blog/handson-ml2

# Open Research

- “If I have seen further it is by standing on the shoulders of giants.”<sup>1</sup> (*Isaac Newton*)
  - 내가 더 멀리 보아왔다면 그것은 거인들의 어깨 위에서 있었기 때문이다.
  - *Computational Reproducibility*<sup>2</sup>:
    - 동일한 데이터, 계산단계, 방법, 코드를 활용하여 일관된 결과를 얻을 수 있는 것



Isaac Newton

<sup>1</sup>Merton, Robert King. *On the shoulders of giants: A Shandean postscript*. Harcourt, 1985.

<sup>2</sup>National Academies of Science, *Reproducibility and Replicability in Science*, 2019



COMMENTS, QUESTIONS  
**THANK YOU!**