

Lecture 01

Course overview

Introduction

Lab webpage

<https://cocoanlab.github.io/>

Cocoan lab

- ABOUT
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- PEOPLE ▾
- PUBLICATION
- RESEARCH ▾
- VIDEOS
- RESOURCES
- JOB

COCOAN lab

Computational Cognitive Affective Neuroscience Laboratory



Cocoan lab is a neuroimaging research lab led by Dr. Choong-Wan Woo.

We are joining the [IBS Center for Neuroscience Imaging Research \(CNIR\)](#) at [Sungkyunkwan University \(Wikipedia\)](#) located in Suwon, South Korea (starting March 2017).

The **keywords** of our research include:

fMRI; Machine learning; Neuroimaging biomarkers; Data science; Translational research; Predictive modeling; Brain decoding; Encoding-decoding model; Pain; Emotions; Psychiatric and neurologic disorders; Mind-body interaction; Behavioral medicine; Network science; Psychological and social pain modulation; Emotion regulation, and more.

The mission of our lab is to understand **pain** and **emotions** in the perspective of data science, cognitive/affective/social neuroscience, and psychology. We also aim to develop clinically useful neuroimaging models and tools that can be used and shared across different research groups and clinical settings.

Our main research tools include functional Magnetic Resonance Imaging (fMRI; we're using 3T and 7T MRI), psychophysiology measures (skin conductance, pupillometry, electrocardiogram, respiration), electroencephalogram (EEG), and other behavioral measures such as facial expression, eye movement, etc. Most importantly, we use data science (computational) tools to model and understand affective, cognitive, and behavioral responses.



Survey

Please complete this before next week class (3/6):

<https://forms.gle/DRUuAU6gpFW9tBSc9>

'Biostat and Big Data' course survey (Spring 2023)

This survey isn't meant to test your knowledge. Rather, it'll help us adjust the class just for you, and make it fun! (이 설문조사는 여러분을 평가하기 위한 것이 아닙니다. 수업이 여러분에게 더 도움이 되고, 즐겁게 만들기 위한 것이니 솔직하고 편하게 작성해주세요!)

 choongwan.woo@gmail.com (not shared) [Switch account](#) 

* Required

Name *

Your answer

Student ID (e.g., 2019123456) *

Your answer

Do you have any experience with data analysis? (데이터 분석을 해본 경험이 있나요?) *

Yes

No

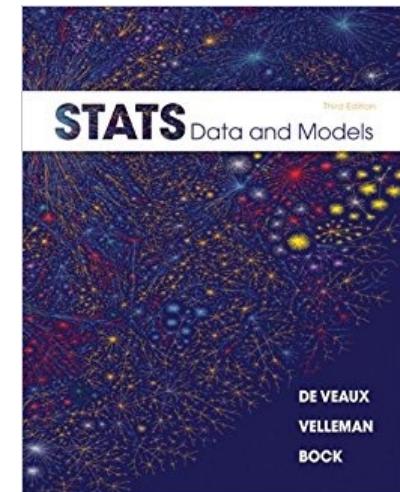
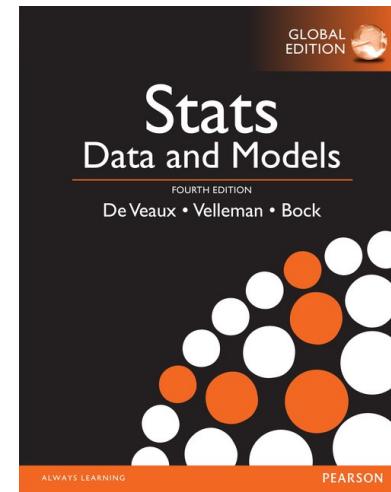
If you have experience with data analysis, please describe it here: (데이터 분석을 해본 적이 있다면, 어떤 분석이었는지, 어디서 했는지 조금 더 설명해주세요.)

Your answer



Course overview

- Biostats and Big data (previously GBME's Probability and Statistics)
- Class code: GBE 3064
- Intro Stats
- Textbook: "Stats: Data and Models" by De Veaux, Velleman, and Bock, Fourth Edition
 - Third edition also works!



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 - Third edition also works!
 - And I recently wrote a textbook in Korean
 - I am sharing this for free!
 - Download: <https://tinyurl.com/4kdx8thf>
 - No cover, no design yet..

(if you want to help with the book design, let me know. ☺)

바이오통계와 빅데이터

(부제: 수학없는 통계)

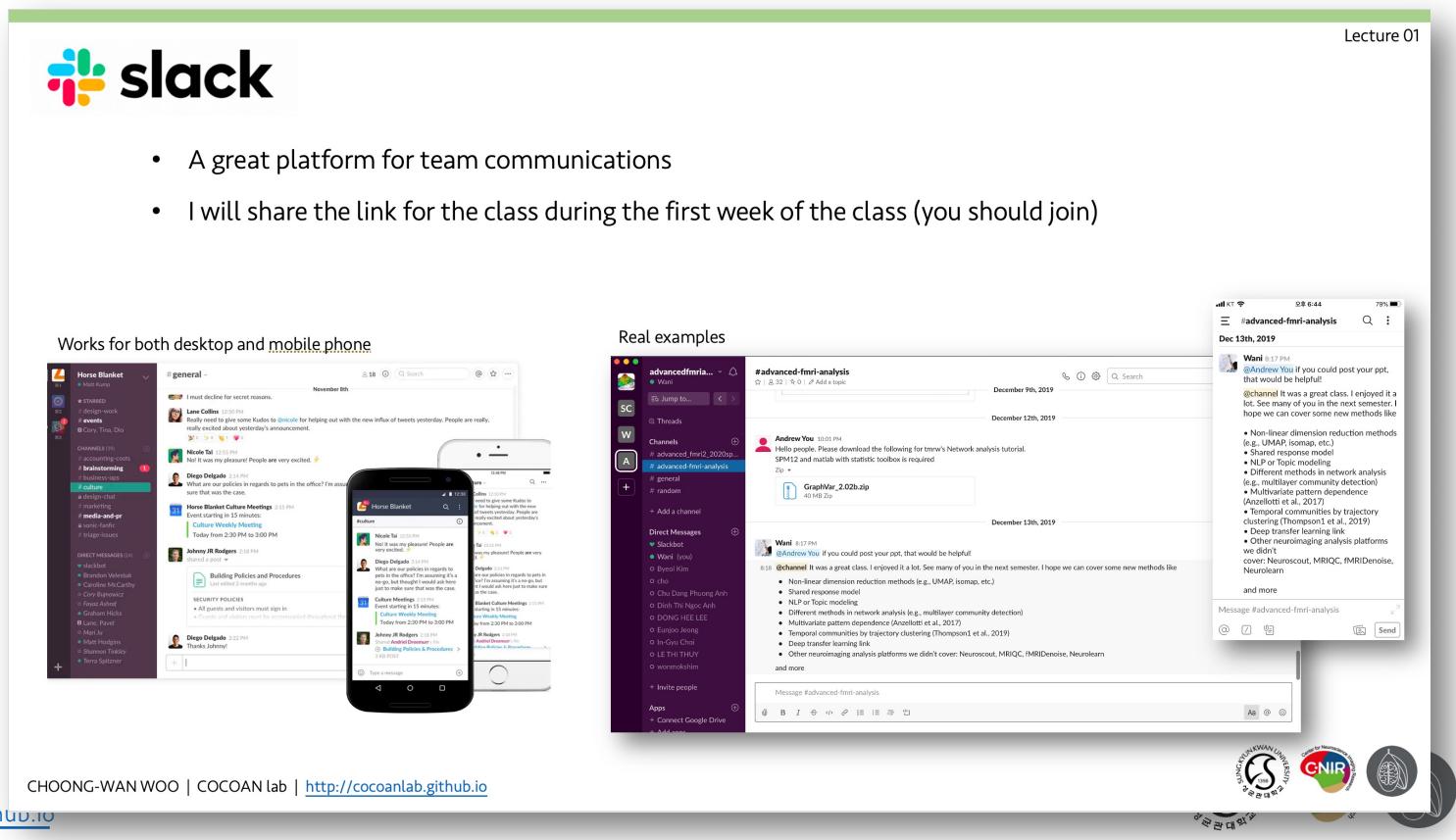
우충완 (성균관대학교 글로벌바이오메디컬공학과)



For communications!

- Previously, I used  slack
 - But this semester, I will try the icampus.. Not sure what would be better..

- What do you think?
(we decided to use
the **icampus** system)

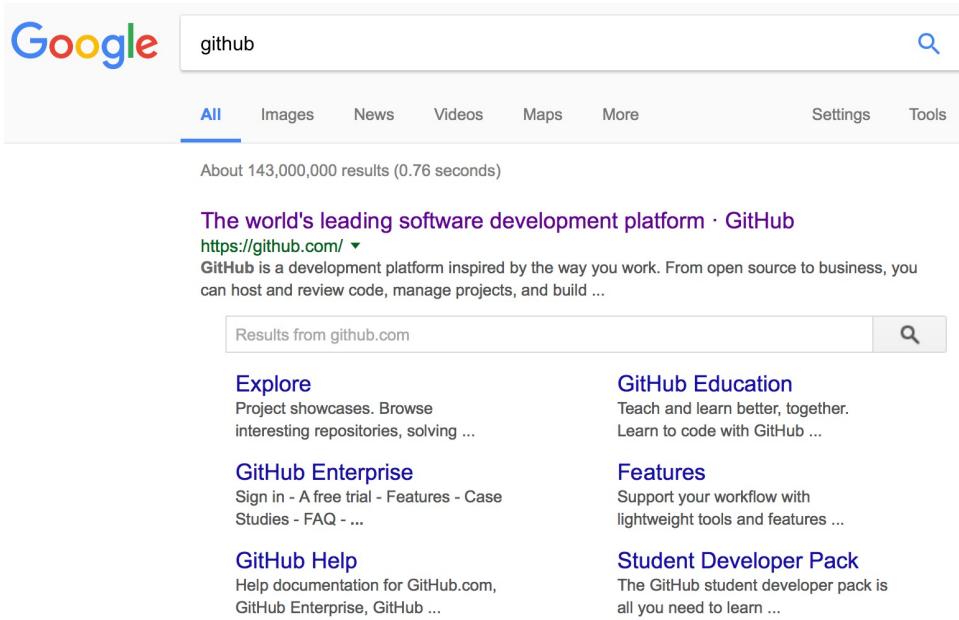


For syllabus and files!

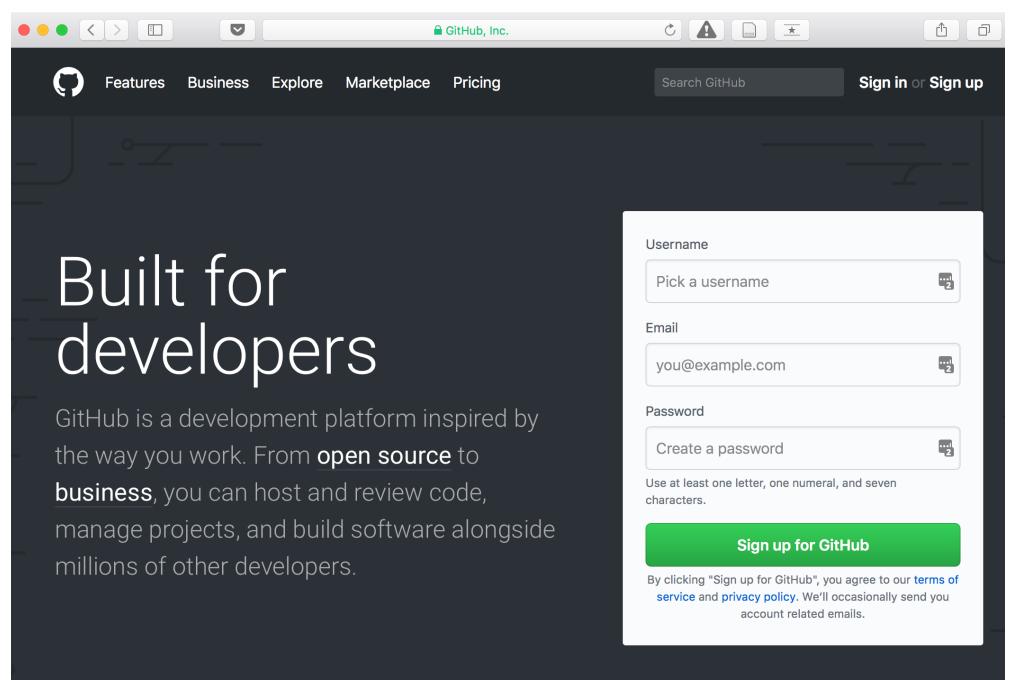


GitHub

- Most popular software development platform: version control, easy-sharing scripts and data, etc.



A screenshot of a Google search results page for the query "github". The results are displayed under the "All" tab. The top result is a link to GitHub's homepage: "The world's leading software development platform · GitHub" (<https://github.com/>). Below the link, a snippet of text reads: "GitHub is a development platform inspired by the way you work. From open source to business, you can host and review code, manage projects, and build ...". To the right of the snippet, there are several promotional cards: "Explore", "GitHub Education", "Features", and "Student Developer Pack". At the bottom of the results page, there is a "Results from github.com" section.



A screenshot of the GitHub sign-up page. The page features a dark header with navigation links: Features, Business, Explore, Marketplace, and Pricing. A search bar and a "Sign in or Sign up" button are also present. The main content area has a large heading "Built for developers". Below the heading, a paragraph describes GitHub as a platform for developers, mentioning open source, business, and project management. To the right, there is a sign-up form with fields for "Username", "Email", and "Password", along with a "Sign up for GitHub" button. A note at the bottom states: "By clicking "Sign up for GitHub", you agree to our [terms of service](#) and [privacy policy](#). We'll occasionally send you account related emails."

For syllabus and files!



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- Everyone uses GitHub for the development, including Google, Facebook, etc.

Google <https://opensource.google.com/>

Repositories 1059 People 1,485

oss-fuzz
OSS-Fuzz - continuous fuzzing of open source software
security fuzzing stability
Shell ★ 1,939 313 Updated a minute ago

syzkaller
syzkaller is an unsupervised, coverage-guided Linux system call fuzzer
testing linux security kernel fuzzing fuzz-testing
Go ★ 1,157 220 Updated 13 minutes ago

ci_edit
python console coding text-editor
Python ★ 21 13 Updated 25 minutes ago

Facebook <https://code.facebook.com/projects/>

Repositories 179 People 170

buck
A fast build system that encourages the creation of small, reusable modules over a variety of platforms and languages.
android python java ios buck build-tool
Java ★ 5,025 776 Updated 22 minutes ago

PathPicker
PathPicker accepts a wide range of input -- output from git commands, grep results, searches -- pretty much anything. After parsing the input, PathPicker presents you with a nice UI to select which files you're interested in. After that you can open them in your favorite editor or execute arbitrary commands.
Python ★ 3,469 215 Updated an hour ago

chisel
Chisel is a collection of LLDB commands to assist debugging iOS apps.
Python ★ 6,159 529 Updated 3 hours ago

For syllabus and files!



- Most popular software development platform: version control, easy-sharing scripts and data, etc.
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- More and more people are creating and sharing a GitHub repository for their research and publications:

For syllabus and files!



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 - E.g., Lee et al., 2021, *Nature Medicine*

ARTICLES
<https://doi.org/10.1038/s41591-020-1142-7>

A neuroimaging biomarker for sustair experimental and clinical pain

Jae-Joong Lee^{1,2}, Hong Ji Kim^{1,2}, Marta Čeko^{3,4}, Bo-yong Park^{1,5}, Soo Ahn Mathieu Roy^{7,8}, Seong-Gi Kim^{1,2}, Tor D. Wager^{6,9} and Choong-Wan Woo^{1,2}

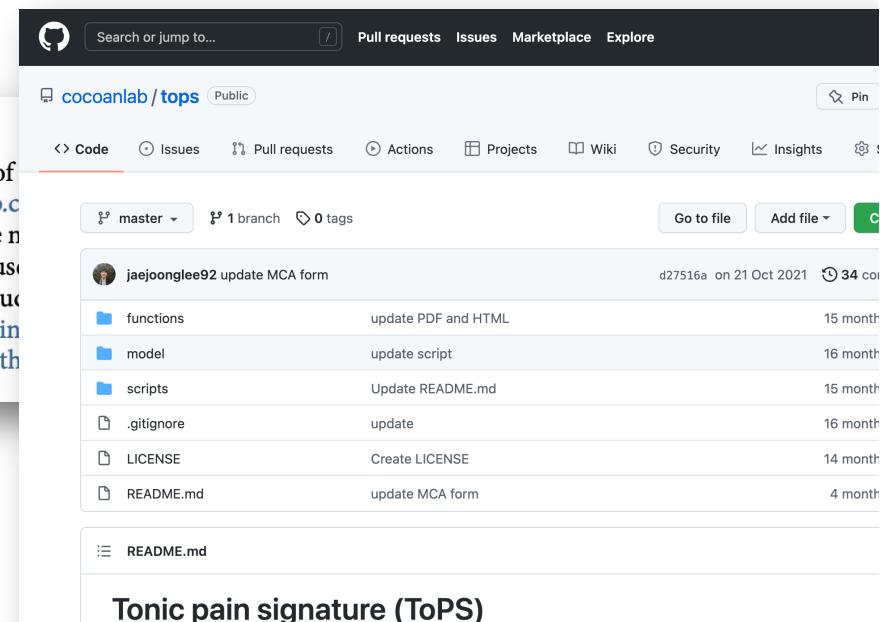


Check for updates

Data availability

The dynamic functional connectivity data of cocoanlab.github.io/tops and <https://github.com/cocoanlab/tops> tutorial. In addition, all the data to generate n GitHub repository. The data that were not used upon reasonable request. The raw data of Stu are publicly available at <http://www.openpain> also be shared through <https://cocoanlab.gith>

CHOONG-WAN WOO | COCOAN lab | <http://cocoanlab.github.io>



cocoanlab / tops Public

Code Issues Pull requests Actions Projects Wiki Security Insights

master 1 branch 0 tags

jaejoonglee92 update MCA form d27516a on 21 Oct 2021 34 commits

File	Description	Last Commit
functions	update PDF and HTML	15 month
model	update script	16 month
scripts	Update README.md	15 month
.gitignore	update	16 month
LICENSE	Create LICENSE	14 month
README.md	update MCA form	4 month

README.md

Tonic pain signature (ToPS)

Our class website: https://github.com/wanirepo/Stats_2023Spring

- README.md is the syllabus.
- Let's visit the website and read the syllabus together.

The screenshot shows a GitHub repository page for 'wanirepo / Stats_2023Spring'. The repository is public and contains 1 branch and 0 tags. The most recent commit was made by 'wanirepo' 3 weeks ago, updating '.gitignore', 'LICENSE', and 'README.md'. The 'README.md' file is expanded, showing its content:

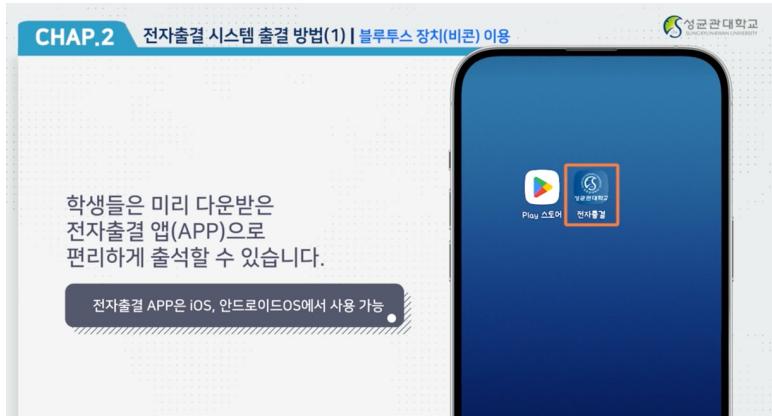
2023 Spring "Biostats and Big Data" at SKKU GBME

• Lecturer: Choong-Wan Woo, Ph.D. Assistant professor (GBME).
• Office: N-center, 86335
• Web: [Cocoan lab](#)
• E-mail: please send the message through iCampus or send me an email to choongwan.woo at gmail dot com
• Class: Mon 1:30-2:45, Wed 12:00-1:15 (flipped class: online recording + offline activity)
• Office hours: Mon 10:00-12:00

Download

You can download the class materials using the following command line.

Smart attendance



출석: 강의시간 5분 전~ 시작 후 10분
지각: 각의시간 +10분 ~ +40분
결석: +40분 이후 또는 미참석



Team activity

Each class, you will form new teams depending on where you sit

4–5 members per team

잘 되어야 할 텐데...

To-do before the next class

Survey before the next class (3/6): <https://forms.gle/DRUuAU6gpFW9tBSc9>

- Watch the first lecture
[V01] Statistics and Data: <https://www.youtube.com/watch?v=hkMrXhG0ot0>
- Next class: 3/6 Monday 1:30 PM here at 86120