

# Introduction to Github

Isabelle Langrock  
*(with some advice from Alvin & Tian)*

October 8, 2021

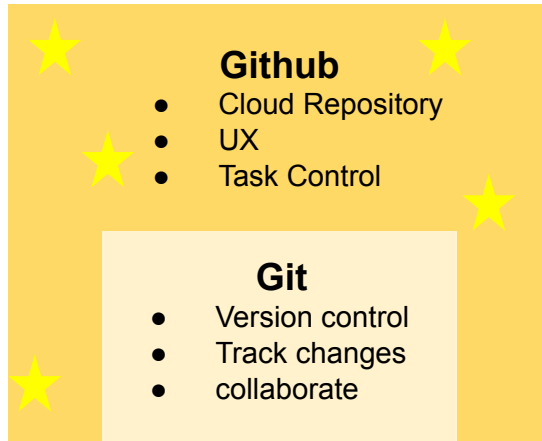


## Before we get started...

1. Download and install Git (<https://git-scm.com/downloads>)
2. Open up a Github account and share your username

# What is Github?

Github is an internet platform for hosting code that works with the version control system **git**. Git is an open source system of version control that tracks changes to a given set of files and facilitates collaborations among coders.



*I think of Github as the shiny packaging of Git.  
Kind of like what Rstudio is to R.*



*The github logo is an **octocat**.  
Why? Idk.*

**+ To Do:**  
Make a Github account!

**+ Book Recommendation:**  
Uncanny Valley by Anna Weiner



# GitHub

**Research**

**Teaching**

**Other  
Uses**

(Personal website,  
cool projects, etc)

# Github & The Computational Research Resources Environment

## Hypothesis Generation



- Upload pre-registrations and any pre-analysis plans

## Data Collection

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## Analysis



- Writing & running all analysis scripts
- Finalizing figures and tables



- Cloud repository for all scripts
- Allows for easy collaboration, replication, and tracking any changes

## Final Stages



- Well documented scripts
- History of all edits to scripts



- Record of Pre-registrations
- Data



- Working Paper

# Github for Research: Organizing Your Code



my\_project.Rproj



01\_Writing

Keep all manuscripts drafts, reports, and presentations here. **Pro Tip!** put the date in the document names of your drafts (e.g. 2021\_10\_08\_manuscripts.docx)



02\_Scripts

Keep all your scripts in here. **Pro Tip!** label your scripts with numbers: 01\_description.R, 02\_regressions.R, etc.



03\_Data

Put all *\*Raw\** Data Files here



04\_Outputs



01\_Data

All *\*cleaned\** or *\*combined\** data files



02\_Figures

Any figures produced by the scripts\*



03\_Tables

Any tables produced by the scripts\*

\*Name figures with the number corresponding to the script (e.g. 01\_distributions.png, 01\_counts.png)

my\_project

+ **Book Recommendation:**  
Kieran Healy's Guide to [Plain Text Social Science](#)

# Github for Research: Cloning a Repository

The screenshot shows the GitHub interface for the repository 'islangrock / Github\_Practice'. The repository is public and has a 'main' branch. The 'Code' button is highlighted with a red circle, and its dropdown menu is open, showing options to clone the repository using HTTPS, SSH, or GitHub CLI, or to open it with GitHub Desktop or download it as a ZIP file.

islangrock / **Github\_Practice** Public

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

main 1 branch 0 tags

islangrock Initial commit

README.md Initial commit

README.md

**Github\_Practice**

Researching and Teaching with Github

Go to file Add file **Code**

**Clone**

HTTPS SSH GitHub CLI

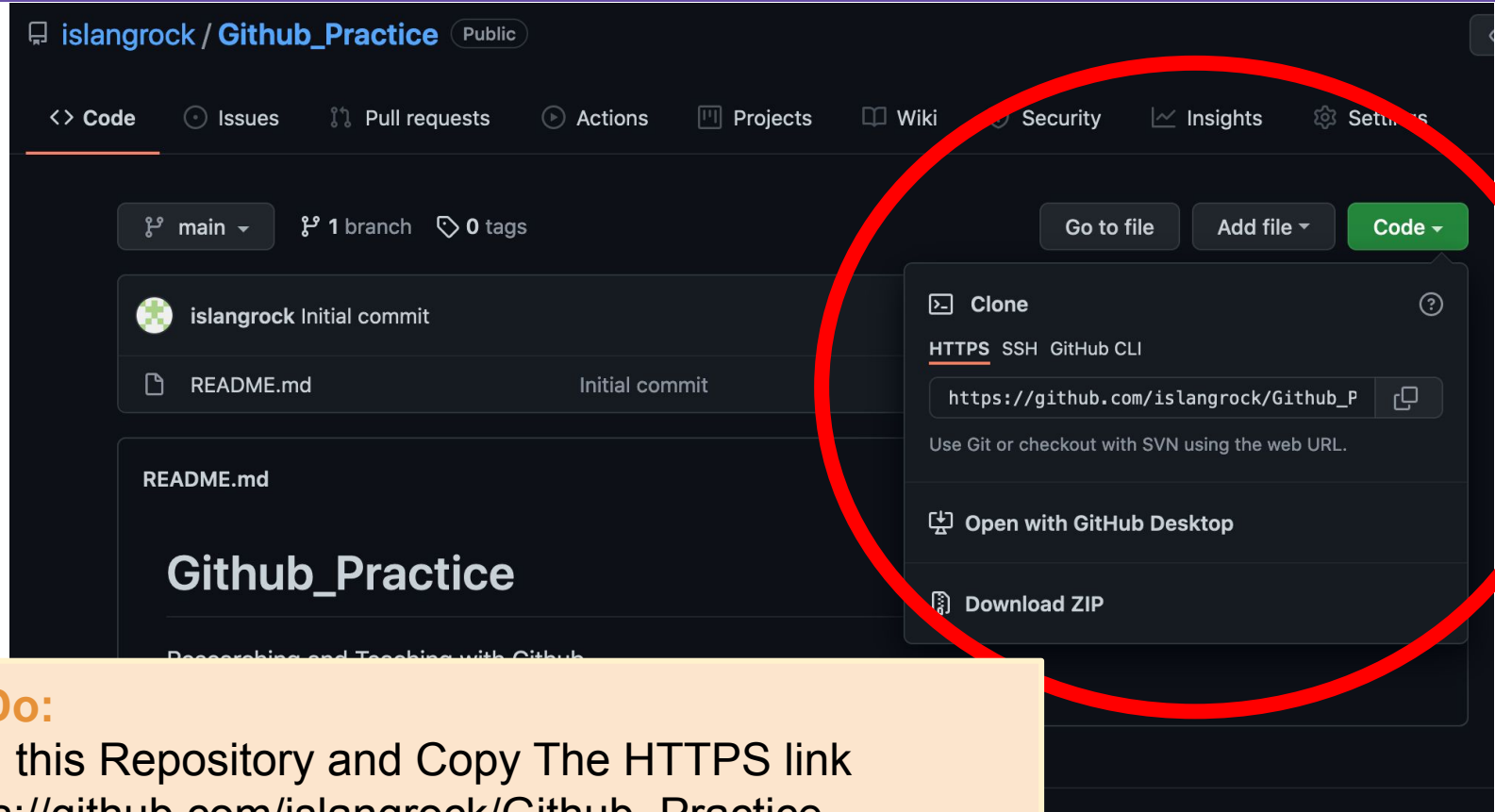
`https://github.com/islangrock/Github_P`

Use Git or checkout with SVN using the web URL.

**Open with GitHub Desktop**

**Download ZIP**

# Github for Research: Cloning a Repository



## + To Do:

Find this Repository and Copy The HTTPS link  
[https://github.com/islangrock/Github\\_Practice](https://github.com/islangrock/Github_Practice)



# Github for Research: Cloning a Repository

1. Decide what folder on your local machine you want the repository ( I chose Desktop)
2. For Mac Users:
  - a. Open Terminal
  - b. Commands:
    - i. `ls` *(brings up list of folders in current directory)*
    - ii. `cd [folder]` *(changes directory to stated folder, so I wrote `cd Desktop`)*
    - iii. `git clone [github repository url]` *(clones github repository to your own desktop)*
3. Now a Folder with everything from the Github repository should be on your machine!

```
isabellelangrock@levy-ve703-01880 ~ % ls
Applications      Dropbox           backup-rstudio-prefs
Box Sync          Library          lib2b51741df6a
Box Sync (backup) Movies           lib2b52e0d3843
Creative Cloud Files Music            lib2b5374c7f8e
Desktop           Pictures         links_birders1.csv
Documents         Public
Downloads         Zotero
isabellelangrock@levy-ve703-01880 ~ % cd Desktop
isabellelangrock@levy-ve703-01880 Desktop % git clone https://github.com/islangrock/Github_Practice.git
Cloning into 'Github_Practice'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
```

# Github for Research: Cloning a Repository

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3. Now a Folder with everything from the Github repository should be on your machine!

```
isabellelangrock@levy-ve703-01880 ~ % ls
Applications      Dropbox            backup-rstudio-prefs
Box Sync          Library           lib2b51741df6a
Box Sync (backup) Movies            lib2b52e0d3843
Creative Cloud Files Music             lib2b5374c7f8e
Desktop           Pictures          links_birders1.csv
Documents         Public
Downloads        Zotero
isabellelangrock@levy-ve703-01880 ~ % cd Desktop
isabellelangrock@levy-ve703-01880 Desktop %
Cloning into '...'
remote: Enumerating objects 1..1
remote: Counting objects 1..1
remote: Compressing objects 1..1
remote: Total 1 (delta 0)
Unpacking objects 1..1
```

**+ To Do:**

Clone the repository to your local machine

# Github for Research: Pulling

**git pull** updates your local repository (the one on your computer) with the remote one (the one on Github). You run these requests when there might be discrepancies between the two.

```
isabellelangrock@levy-ve703-01880 ~ % cd Desktop/Github_Practice
isabellelangrock@levy-ve703-01880 Github_Practice % git pull
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
From https://github.com/islangrock/Github_Practice
  27be2b2..f5ea704  main      -> origin/main
Updating 27be2b2..f5ea704
Fast-forward
 practice_pull_request.md | 13 ++++++++
 1 file changed, 13 insertions(+)
 create mode 100644 practice_pull_request.md
isabellelangrock@levy-ve703-01880 Github_Practice %
```

## + To Do:

Nothing! Since you just cloned your repository it should be all updated

# Github for Research: Branches and Pushing

**+ To Do:** (Also referenced in the `practice_pull_request.md` file)

First we need to create some edits that we can push!

Thus, on your local machine create a new `.md` file in your favorite text editor (Rstudio, Sublime, etc) that includes the following information:

1. Your favorite color
2. The last book you read or what you are currently reading
3. A TV or Movie Recommendation
4. Choose one: Donut or Croissant??

Save it with your name as the file name in the local repository.



Isabelle.md



practice\_pull\_request.md



README.md

# Github for Research: Branches and Pushing

```
[isabellelangrock@levy-ve703-01880 Github_Practice % git checkout -b branch_IL
Switched to a new branch 'branch_IL'
[isabellelangrock@levy-ve703-01880 Github_Practice % git add Isabelle.md
[isabellelangrock@levy-ve703-01880 Github_Practice % git commit -m "Adding my response"
[branch_IL 0c6b916] Adding my response
 1 file changed, 5 insertions(+)
 create mode 100644 Isabelle.md
isabellelangrock@levy-ve703-01880 Github_Practice % git status
[On branch branch_IL
nothing to commit, working tree clean
isabellelangrock@levy-ve703-01880 Github_Practice % git push -u origin branch_IL
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 440 bytes | 440.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
remote:
remote: Create a pull request for 'branch_IL' on GitHub by visiting:
remote:      https://github.com/islangrock/Github_Practice/pull/new/branch_IL
remote:
To https://github.com/islangrock/Github_Practice.git
 * [new branch]      branch_IL -> branch_IL
Branch 'branch_IL' set up to track remote branch 'branch_IL' from 'origin'.
```

# Github for Research: Branches and Pushing

**git checkout [branch]**  
**git checkout -b [branch]**

Moves you to a specific branch. Branches are different versions of the repository that allow you to make pull requests and easily view the changes to the original code. Use git checkout [branch] when there's a branch already existing. Use git checkout -b [branch] when you want to create a new branch.

**git add [file name]**

This tracks the file you have added and prepares it to be added to the remote repository.

**git commit -m "[comment]"**

Commits all changes and new files and allows you to add a comment about what changes you made. Make these concise but description! There is room for longer comments in the pull requests.

**git push -u origin [branch]**

Pushes your commits to the remote repository -- they should now appear on Github.com

**git status**

If you lose track of whats been added or committed, run this! It will tell you.

# Github for Research: Branches and Pushing

**git checkout [branch]**  
**git checkout -b [branch]**

Moves you to a specific branch. Branches are different versions of the repository that allow you to make pull requests and easily view the changes to the original code. Use git checkout [branch] when there's a branch already existing. Use git checkout -b [branch] when you want to create a new branch.

## + To Do:

Create a new branch, add your file, commit with a comment and push it to the github repository!

for longer comments in the pull requests.

**git push -u origin [branch]**

Pushes your commits to the remote repository -- they should now appear on Github.com

**git status**

If you lose track of what's been added or committed, run this! It will tell you.

# Github for Research: Pull Requests

islangrock / Github\_Practice Public

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

branch\_IL had recent pushes 19 minutes ago

Compare & pull request

main 1 branch 0 tags

Go to file Add file Code

islangrock add file with practice instructions f5ea704 29 minutes ago 2 commits


README.md	Initial commit	1 hour ago
practice_pull_request.md	add file with practice instructions	29 minutes ago



# Github for Research: Pull Requests

## Open a pull request


Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#).

 base: main

←

compare: branch\_IL










✓ **Able to merge.** These branches can be automatically merged.



Adding my response

Write

Preview

H B I         

per instructions, I have added this file!

Write something here!

Attach files by dragging & dropping, selecting or pasting them.

Create pull request

▼

# Github for Research: Pull Requests

## Adding my response #1

Open islangrock wants to merge 1 commit into `main` from `branch_IL`

Conversation **0** Commits **1** Checks **0** Files changed **1**

islangrock commented now Owner

per instructions, I have added this file!

Adding my response 0c6b916

Add more commits by pushing to the `branch_IL` branch on `islangrock/Github_Practice`.

Continuous integration has not been set up  
GitHub Actions and several other apps can be used to automatically catch bugs and enforce style.

This branch has no conflicts with the base branch  
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view command line instructions.

Write Preview

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Close pull request Comment

Pull request successfully merged and closed Delete branch

You're all set—the `branch_IL` branch can be safely deleted.

# Github for Research: Tips for collaborating


- Work with one branch for each round of revisions and/or collaborator
  - Multiple branches make things more complicated
- Review code before merging pull requests
- Document all your changes in the pull requests
- Make simple and descriptive comments on your commits



## Good Commit Comments



“Streamlined script for data collection”  
“Updates to figures 03 and 05”  
“Updating variable X with new data”  
“Adding regression models with interaction”

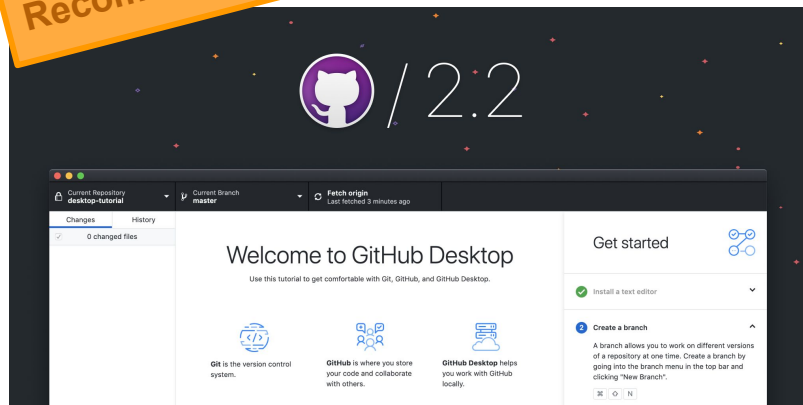


## Bad Commit Comments

“ “  
“Added new files”  
“New code”  
“Changed the scripts”  
“updates”

# Github for Research: Other Methods of Using Github

Recommended by Alvin!



Read more here:

<https://docs.github.com/en/desktop>

Recommended by Tian!



Read more here:

<https://r-pkgs.org/git.html>

# Github for Teaching

## PROS

Easy  
Code Review

Encouraging  
collaboration

Accessible host  
for course  
materials

## CONS

There is a learning  
curve!

Read this!

**THE VERGE**

## File not found

*A generation that grew up with Google is forcing professors to rethink their lesson plans*

By **Monica Chin** on September 22, 2021 8:00 am

*Illustrations by Micha Huigen*

# Github for Other Things!

**Make & Host Your Own Website!**

**find code + niche r packages  
that can help your work**

**Shiny Apps & Other Work**

**Share Presentations, Talks,  
And Workshops**