

GitHub Tutorials

for 2020 ASME-CIE Hackathon: Identifying, Extracting,
Analyzing Value from Large Unstructured Data Sets in
Mechanical Engineering

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What is GitHub?

Software development

Git is the free and open source distributed version control system that's responsible for everything GitHub related that happens locally on your computer.

- This cheat sheet is your friend,
- but other official guides are also available

Hello World

- go to <https://www.github.com>
- create an account (it's free!)
- create a new repository ("repo")
 - choose your favorite license for your implementation (you own your codes!)
 - write a README.md
- invite others to join your GitHub repo

GitHub Setup

- config to ~/.config

```
git config --global user.name "FirstName LastName"
git config --global user.email "a@b.com"
git config --global color.ui auto
git config --global core.editor "nano" # or your fav editor
```

- (optional) create a long-term key to your own device (i.e. if somebody uses your laptop then they can get to your GitHub repo WITHOUT logins)

```
ssh-keygen -t rsa -b 4096 -C "a@b.com"
# when prompt, type id_rsaGitHub
# will generate id_rsaGitHub and id_rsaGitHub.pub
eval `ssh-agent -s` # start an ssh agent
ssh-add ~/.ssh/id_rsaGitHub # add ssh-key to ~/.ssh/config
# then add ssh public key into Git account through web interface
ssh -vT git@github.com

# expect a message like this
Hi XXX! You've successfully authenticated, but GitHub does not provide shell access.
```

Git in action

- clone

```
git clone https://github.com/pytorch/pytorch.git # https
# git clone git@github.com:pytorch/pytorch.git # ssh - SSH required
# you can also switch mode in ./git/config in the local GitHub repo
```

- typical workflow (this is what you will use the most)

```
git add # be specific, e.g. git add testABC.py
# git add * # this is ok, but beware of your colleagues' concurrent work
# NEVER USE: git add * -f
```

```
git commit # or git commit -m "write some notes", git commit --amend
git pull --rebase # git fetch # optional: only if there are conflicts
```

```
git push # or git push origin master
# or git stash: https://git-scm.com/docs/git-stash
```

- read logs from your teammates

```
git log
```

- remove, copy, move

```
git rm file.txt
git mv file.txt test/
```

- see what have been changed

```
git diff
# or
git diff SHA1 SHA2
```

- check status

```
git status
```

Git in action (advanced)

- **reset to previous version (advanced)**

```
git reset --hard <SHA> # e.g. commit a5fdab97d911414660683c89b6cecd965b55ce16
```

- **create a branch**

```
git branch my_debug_branch  
git checkout my_debug_branch
```

```
git checkout master  
git merge my_debug_branch
```

```
# git branch -v  
# git branch -list
```

- **other helpful sources: [here](#)**

README.md

- Pandoc/markdown style; official guide [here](#)

- text

It's very easy to make some words **bold** and other words *italic* with Markdown. You can even [link to Google!](http://google.com)

- headers

This is an <h1> tag
This is an <h2> tag
This is an <h6> tag

- emphasis

This text will be italic
This will also be italic
****This text will be bold****
__This will also be bold__
*_You **can** combine them_*

- strikethrough

~~~~this~~~~



# README.md

## ● list: unordered

- \* Item 1
- \* Item 2
  - \* Item 2a
  - \* Item 2b

## ● list: ordered

1. Item 1
1. Item 2
1. Item 3
  1. Item 3a
  1. Item 3b

## ● images

![GitHub Logo] (/images/logo.png)  
Format: ![Alt Text] (url)

## ● hyperlink

<http://github.com> - automatic!  
[GitHub] (<http://github.com>)

## ● inline code

I think you should use an  
`<addr>` element here instead.

# README.md

- GitHub flavored markdown

```
```python
def foo():
    if not bar:
        return True
```
```

```
```matlab
function y = foo(x)
    y = x
end
```
```

# GitHub Desktop (GUI): <https://desktop.github.com/>

The screenshot shows the GitHub Desktop application interface. The top bar includes a menu (File, Edit, View, Repository, Branch, Help) and status information (Current repository: desktop, Current branch: esc-pr #3972, Fetch origin button, Last fetched 2 minutes ago).

The left sidebar displays the commit history, listing recent commits such as "Appease linter", "Add event handler to dropdown compon...", "Move escape behavior to correct compo...", "Remove event handler from the branches..", "Merge branch 'master' into esc-pr", "Merge pull request #4044 from desktop/...", "Merge pull request #4070 from desktop/...", "bump to beta3", "Merge pull request #4057 from desktop/...", "Merge pull request #4067 from desktop/...", and "Release to 1.1.0-beta2".

The main area shows the commit details for the selected commit, including the commit message "Add event handler to dropdown component", the commit hash "c79e71c", and the commit author "iAmWillShepherd and Markus Olsson". Below this, the file path "app/src/ui/toolbar/dropdown.tsx" is shown, and the code diff is displayed. The diff shows changes to the "ToolbarDropdown" component, including the addition of a "private get isOpen()" method and a "private onFoldoutKeyDown" event handler.

```

@@ -145,6 +145,10 @@ export class ToolbarDropdown extends React.Component<
  this.state = { clientRect: null }
}

145      145
146      146
147      147
148  +   private get isOpen() {
149  +     return this.props.dropdownState === 'open'
150  +   }
151  +
148      152   private dropdownIcon(state: DropdownState): OcticonSymbol {
149      153     // @TODO: Remake triangle octicon in a 12px version,
150      154     // right now it's scaled badly on normal dpi monitors.
151      155
@@ -249,6 +253,13 @@ export class ToolbarDropdown extends React.Component<
}
}
}

249      253
250      254
251      255
256  +   private onFoldoutKeyDown = (event: React.KeyboardEvent<HTMLElement>) => {
257  +     if (!event.defaultPrevented && this.isOpen && event.key === 'Escape') {
258  +       event.preventDefault()

```

# GitHub Desktop (GUI): <https://desktop.github.com/>

- official docs:  
<https://docs.github.com/en/free-pro-team@latest/desktop>
- install and configure GitHub Desktop:  
<https://docs.github.com/en/free-pro-team@latest/desktop/installing-and-configuring-github-desktop>
- contributing and collaborating using GitHub Desktop:  
<https://docs.github.com/en/free-pro-team@latest/desktop/contributing-and-collaborating-using-github-desktop>