

# GitHub Tutorials

for 2021 ASME-CIE Hackathon: Identifying, Extracting,  
Analyzing Value from Large Unstructured Data Sets in  
Mechanical Engineering

Anh Tran

Optimization and Uncertainty Quantification Department  
Computer Science Research Institute  
Sandia National Laboratories

August 13, 2021

# Outline

- 1 Introduction
- 2 Hello World
- 3 Setup
- 4 Code Development
- 5 README.md
- 6 GitHub Desktop

# 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 favorite 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*****@gmail.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 ***! 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/
```

# Git in action

- see what have been changed between commits

```
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 with the following entries:

- Appease linter (iAmWillShepherd committed a day ago)
- Add event handler to dropdown compon... (iAmWillShepherd and Markus Olsson co...)
- Move escape behavior to correct compo... (iAmWillShepherd and Markus Olsson co...)
- Remove event handler from the branches.. (iAmWillShepherd and Markus Olsson co...)
- Merge branch 'master' into esc-pr (iAmWillShepherd committed a day ago)
- Merge pull request #4044 from desktop/... (Neha Batra committed a day ago)
- Merge pull request #4070 from desktop/... (Brendan Forster committed 2 days ago)
- bump to beta3 (Brendan Forster committed 2 days ago)
- Merge pull request #4057 from desktop/... (Brendan Forster committed 2 days ago)
- Merge pull request #4067 from desktop/... (Brendan Forster committed 2 days ago)
- Release to 1.1.0-beta2 (Neha Batra committed 2 days ago)

The main area shows the code diff for the file `app/src/ui/toolbar/dropdown.tsx`. The title is "Add event handler to dropdown component". The commit is by iAmWillShepherd and Markus Olsson, with commit hash c79e71c and 1 changed file.

The diff shows changes to the `ToolbarDropdown` component. The code includes a state object `this.state` with `clientRect: null`, a `private get isOpen()` method, a `private dropdownIcon` 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>