git/GitHub For Developers

June 26, 2024

Engineers for Exploration, UC San Diego

Resume Dec 2023 - Sean Perry

Resume Dec 2022 - Sean Perry

Resume June 2022 - Sean Perry

Resume APRAIL 2020- Sean Perry
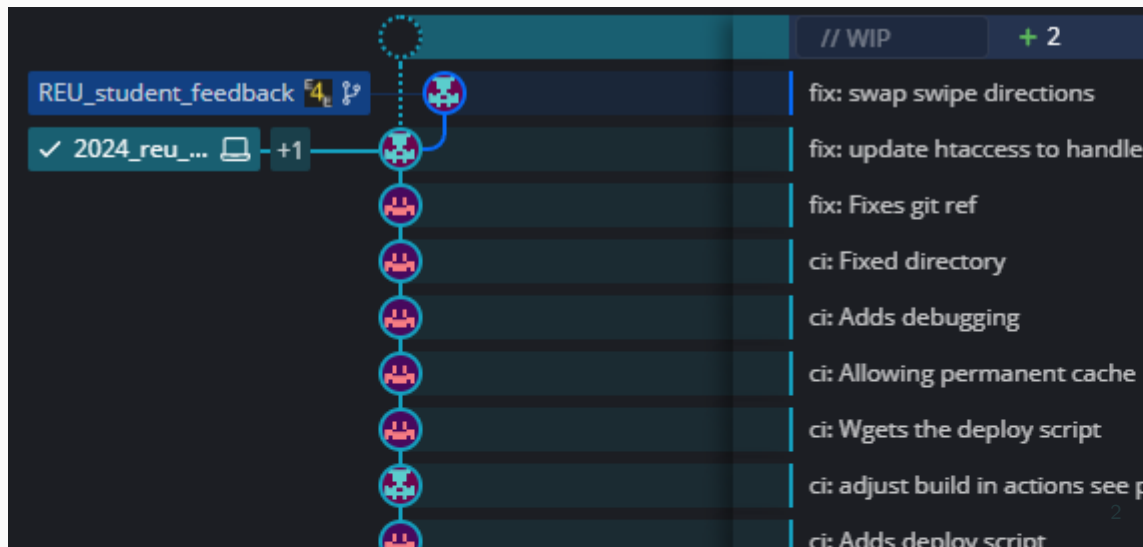
Resume OCTOBER 2021 - Sean Perry

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REU_student_feedback 4

✓ 2024_reu_... +1

// WIP + 2

fix: swap swipe directions

fix: update htaccess to handle

fix: Fixes git ref

ci: Fixed directory

ci: Adds debugging

ci: Allowing permanent cache

ci: Wgets the deploy script

ci: adjust build in actions see

ci: Adds deploy script

- **Git vs. GitHub:** Distributed VCS vs. collaboration platform.
- **Purpose:** Enhances project management and teamwork.
- **Git Helps By:** tracking and saving verision changes over time
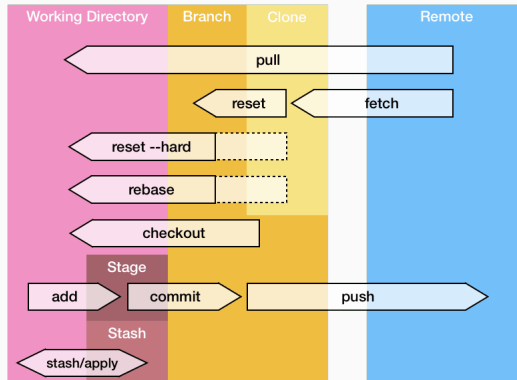
Tags

- Marks significant project milestones.
- Useful for release points, use semantic versioning.
- Lightweight tags: *git tag tagname*.
- Annotated tags: *git tag -a tagname "message"*.
- List/delete tags: *git tag*, *git tag -d tagname*.

Git Workflows

- Feature Branch Workflow
- Gitflow Workflow
- Fork Workflow

Feature Branch Workflow

- Develop each feature in its own branch.
- Merges via pull requests for code review.
- Keeps main branch stable, encourages collaboration.
- Ideal for projects with simultaneous feature development.
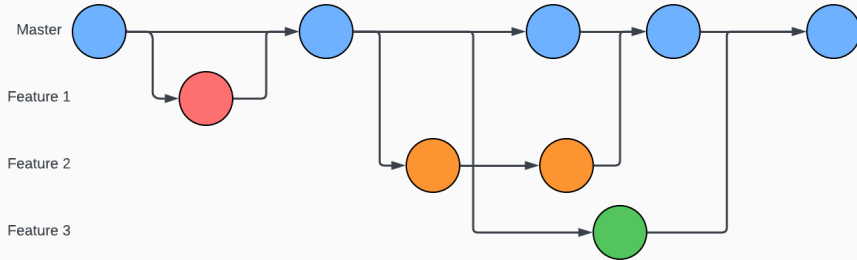
Gitflow Workflow

- Structured model: development, features, releases, hotfixes.
- Systematic release management, clear branch roles.
- Tracks progress efficiently, supports parallel releases.
- Suited for scheduled release cycles.
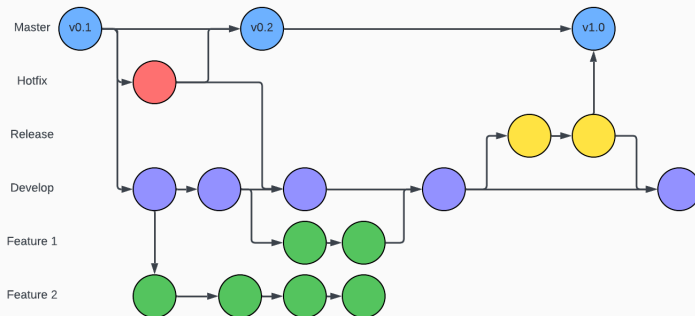
Fork Workflow

- Developers work on personal repository copies.
- Changes proposed via pull requests.
- Encourages external contributions, safe experimentation.
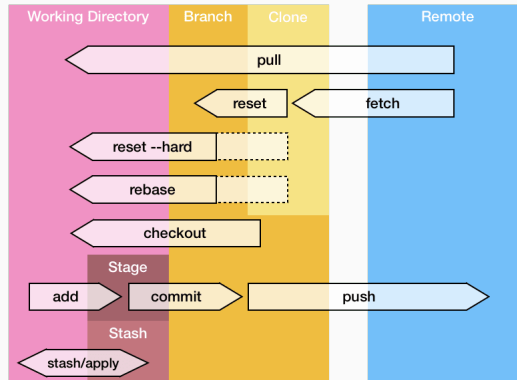- Ideal for open-source and large collaborations.
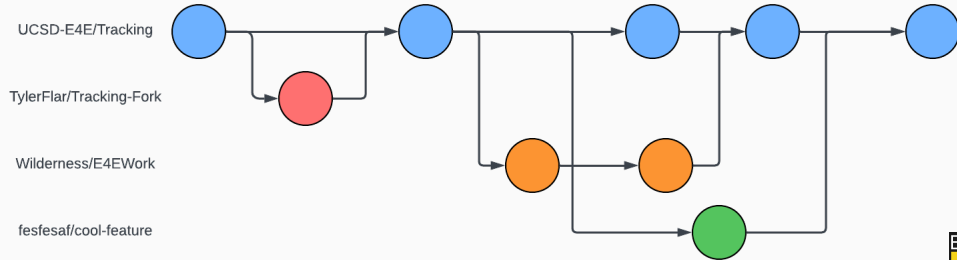
.gitignore

```
.gitignore
1   # Created by https://www.toptal.com/developers/gitignore/api/latex,
2   # Edit at https://www.toptal.com/developers/gitignore?templates=lat
3
4   ### LaTeX ###
5   ## Core latex/pdflatex auxiliary files:
6   *.aux
7   *.lof
8   *.log
9   *.lot
10  *.fls
11  *.out
12  *.toc
13  *.fmt
14  *.fot
15  *.cb
16  *.cb2
17  .*.lb
18
19  ## Intermediate documents:
20  *.dvi
21  *.xdv
22  *-converted-to.*
23  # these rules might exclude image files for figures etc.
24  # *.ps
25  # *.eps
26  # *.pdf
27
```

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UI or CLI?

- UI's exist to wrap around git
- CLI $\rightarrow$ Helps better understand whats happening
- CLI $\rightarrow$ May only have access to CLI
- UI $\rightarrow$ Useful for manging many repos
- UI $\rightarrow$ Visualization is nice

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- **Git vs. GitHub:** Distributed VCS vs. collaboration platform.
- **Purpose:** Enhances project management and teamwork.
- **GitHub helps by:** Being a collaborator platform built upon being a remote repo

Whatabout GitHub?

- https://github.com/UCSD-E4E/website2.0

Report Issues

- Tracks Bugs, Features Ideas, Discussions
- Assign people and PRs to address
- https://github.com/UCSD-E4E/website2.0/issues/142

Pull Requests (PR) Management

- Handles merging branches from collaborators together
- Keep PRs small for easy review.
- Automate tests and checks via GitHub Actions.
- https://github.com/UCSD-E4E/website2.0/pull/135
- Most of the time merges work... but sometimes

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Merging a Merge Conflict: Do's and Don'ts

- Conflicts occur when a branch does not have some newer changes
- **don't try fixing a merge conflict without talking to your lead**
- anytime you are about to change git history, talk to a lead
- Here is how to fix: merge conflict example
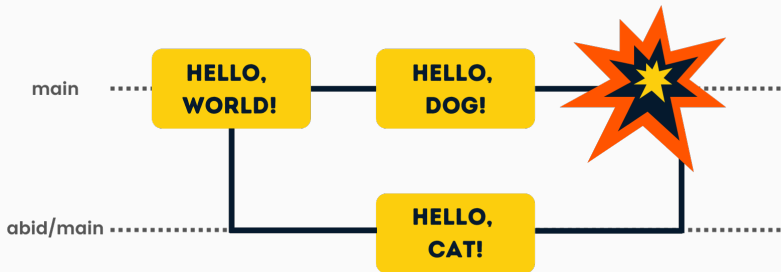
Putting it Together!

- Lets start by adding to the blogpost!
- Have blog post showing you were in the program!
- Send me on slack your github username
- Clone https://github.com/UCSD-E4E/website2.0
- Checkout "2024_reu_students" branch
- make a new branch for your changes
- Go to _posts/
- Add a photo + small blog, you can change it later
- photo can be dumped into "assets/people" change to notation: s.perry.jpg
- Commit and push those changes to github
- Make a PR for your changes

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Extras: GitHub Actions for Automation

- Triggered by GitHub events (push, PRs).
- Workflows combine actions in YAML files.
- Runs on GitHub-hosted or self-hosted runners.
- Automates tests and deployment on PR merge.
- Auto-assigns issues, auto-labels PRs by path.

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Extras: Releases

- Draft new release, choose git tag.
- Add release notes describing changes.
- Bundles code, executables, and assets.
- Detailed notes inform users of updates.
- Example: https://github.com/HumanSignal/label-studio/releases

Extras: Code Security
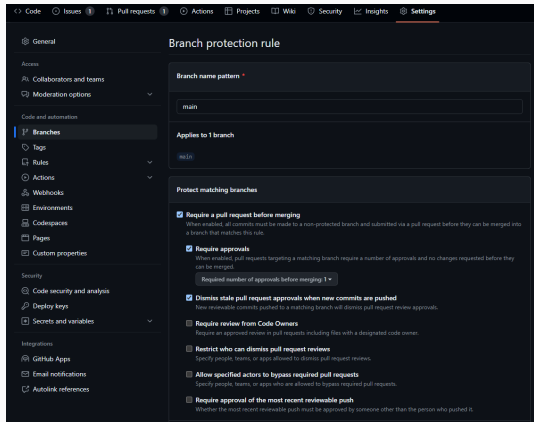
Protection against:

- Vulnerable dependencies
- Some code vulnerabilities
- Some committed secrets
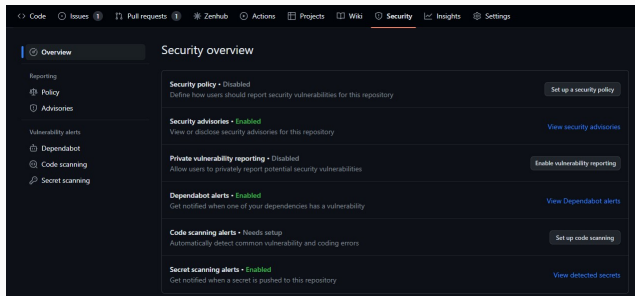
Why do we need branch protections?

Configuring Branch Protection

Branch Protection Example

https://github.com/UCSD-E4E/branch_protections_demo