

This presentation is released under the terms of the **Creative Commons Attribution-Share Alike** license.

You are free to reuse it and modify it as much as you want as long as

- (1) you mention me as being the original author,
- (2) you re-share your presentation under the same terms.

You can download the sources of this presentation here:
<https://github.com/severin-lemaignan/git-presentation/>

**WITH
PLYMOUTH
UNIVERSITY**

git

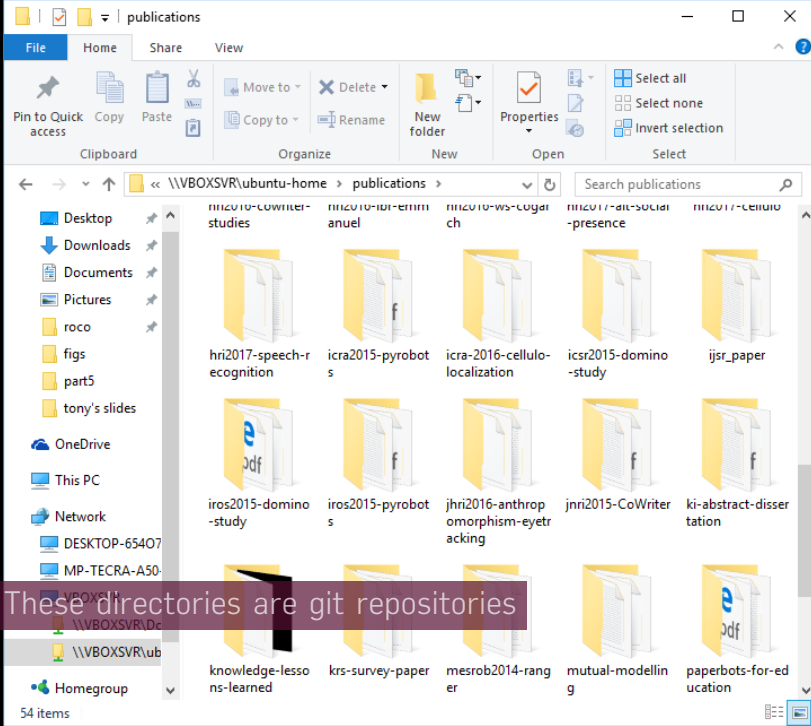
the basics

25 Jan. 2017

Séverin Lemaignan

Centre for Robotics & Neural Systems
Plymouth University





File

Home

Share

View

Pin to Quick access

Clipboard

Copy

Paste

Move to

Copy to

Delete

Rename

New folder

New

Properties

Open

Select all

Select none

Invert selection

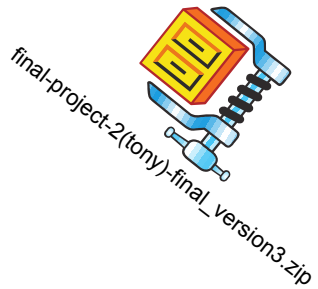
Select

← → ↕ ↑ << publications > jnnr2015-CoWriter > Search jnnr2015-CoWriter 🔍

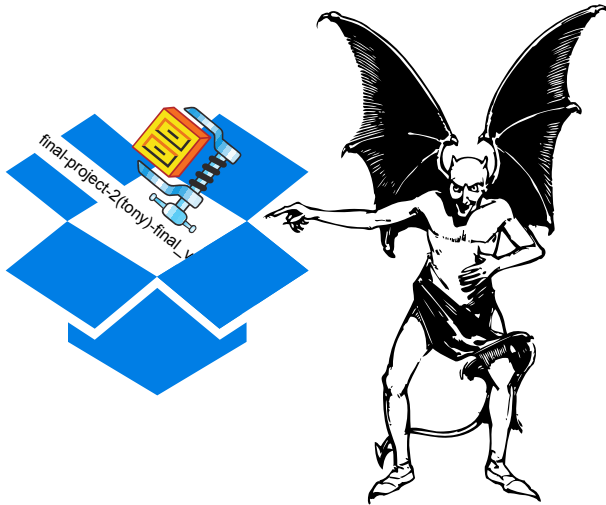
	Name	Date modified	Type	Size
Desktop	.git	11/5/2014 1:29 PM	File folder	
Downloads	figures	11/5/2014 12:39 PM	File folder	
Documents	lemaignan2014being.pdf	11/5/2014 1:29 PM	PDF File	5,11
Pictures	library.bib	11/5/2014 12:39 PM	BIB File	7
roco	library.bib.bak	11/5/2014 12:39 PM	BAK File	7
figs	main.aux	11/5/2014 1:29 PM	AUX File	
part5	main.bbl	11/5/2014 1:16 PM	BBL File	
tony's slides	main.blg	11/5/2014 1:16 PM	Performance Mon...	
OneDrive	main.log	11/5/2014 1:29 PM	Text Document	3
This PC	main.new.tex	11/5/2014 12:39 PM	TEX File	5
Network	main.out	11/5/2014 1:29 PM	OUT File	
DESKTOP-65407	main.pdf	11/5/2014 1:29 PM	PDF File	5,11
MP-TECRA-A50	main.tex	11/5/2014 1:29 PM	TEX File	1
VBOXSVR	Makefile	11/5/2014 12:39 PM	File	
\\VBOXSVR\De	sig-alternate.cls	11/5/2014 12:39 PM	CLS File	5
\\VBOXSVR\ub	sig-alternate.cls	11/5/2014 12:39 PM	PY File	

They look boringly normal

A few roundtrips later with colleagues...









Get Started

Wall

Hidden Posts

- Info
- Listings
- Photos
- Dan's Welcome Page
- Discussions
- Edit

About

7
people like this

Add to My Page's Favorites

Tony King B.

Real Estate · Toronto, Ontario

Edit Page

Wall

Tony King B. · Most Recent ▾

Shares: Status Photo Link Video

Write something...



Tony King B.

Paul, you can take my change below:

```
using namespace std;
using namespace cv;
HeadPoseEstimation::HeadPoseEstimation(const string& face_detection_model, float focalLength) :
    focalLength(focalLength),
    opticalCenterX(-1),
    opticalCenterY(-1)
{
    // Load face detection and pose estimation models.
    detector = get_frontal_face_detector();
    deserialize(face_detection_model) >> pose_model;
    51 Impressions · 0% Feedback
    Tuesday at 2:25pm via re2social · Like · Comment
```



Tony King B.

SVH is really cool, but I like Facebook better!

51 Impressions · 0% Feedback
 Tuesday at 2:25pm via re2social · Like · Comment

Admins (4) [?]

[See All](#)

Use Facebook

Promote with an Ad

View Insights

Suggest to Friends

You

Tony King B. likes this.

Quick Tips

Get more people to like your Page with Facebook Ads today!

[Get More Connections](#)

Sample Ad



The text of your ad will go here.

Like · JP Zeni likes this.



Tony King B.

Real Estate · Toronto

Edit Profile

Edit Page

Most Recent

Admins (4)

See All

Get Started

Wall

Hidden Posts

Info

Listings

Photos

Dan's Welcome Page

Discussions

Edit

About

Edit



Tony King B.

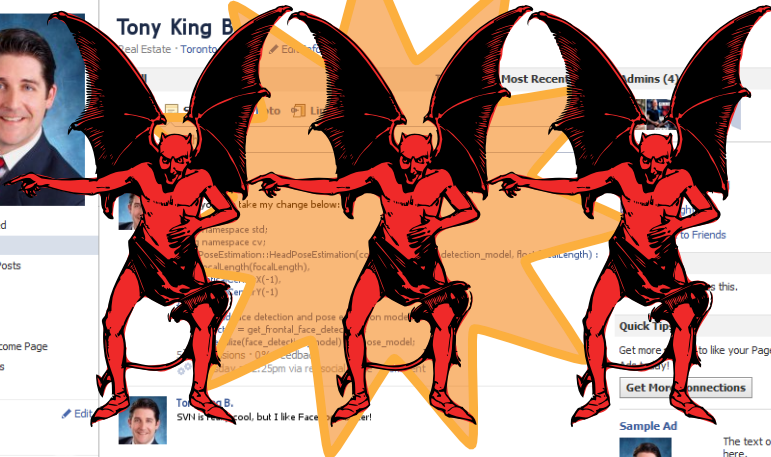
SVH is really cool, but I like Facebook!

51 Impressions · 0% Feedback

Tuesday at 2:25pm via re2social · Like · Comment

7
people like this

Add to My Page's Favorites



Quick Tip

Get more people to like your Page with Facebook Ads today!

Get More Connections

Sample Ad



The text of your ad will go here.

Like · JP Zeni likes this.

We can do better!

We can do better!

git is essentially about recording the history of files

We can do better!

git is essentially about recording the history of files
(and who did what)

We can do better!

git is essentially about recording the history of files
(and who did what)
(and sharing as well)

VERSIONING

WHY VERSIONING?

- The history of your development/document
- Compare the current code with an older version
- Roll-back to previous versions
- Experiment without losing anything
- Trace who did what (at the level of the line of code)
- Annotate your workflow (important milestones, etc)
- Avoid catastrophes!

ATOMIC COMMITS

The single most important concept (because it requires to think about development/writing in terms of **functional units**):

Atomic commit

A (typically small) commit that represent a **single, coherent & complete** functional change.

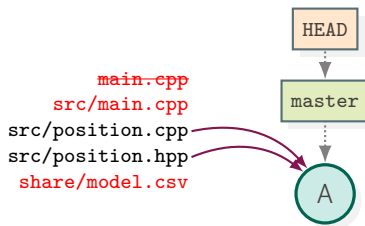
ATOMIC COMMITS

The single most important concept (because it requires to think about development/writing in terms of **functional units**):

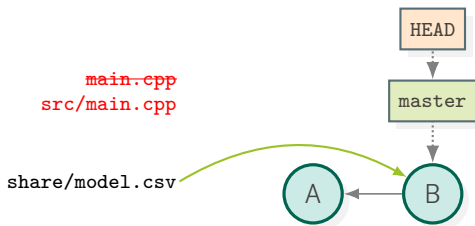
Atomic commit

- Easy to understand the change
- Debugging made easy (`git bisect`)
- Collaboration made easy (less, smaller conflict)
- Easy to write a useful commit message

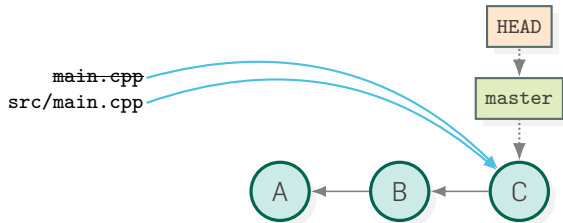
```
main.cpp  
src/main.cpp  
src/position.cpp  
src/position.hpp  
share/model.csv
```



```
git add src/position.*  
git commit -m"Fix computation of position (float->double)"
```



```
git add share/model.csv
git commit -m"Re-trained model with 52 more participants"
```



```
git rm main.cpp  
git add src/main.cpp  
git commit -m"Move main.cpp to src/"
```

LOG

```
$ git log
```

```
commit fa009cd7fca05b0b61170b20cf76a5f72b8843c2
```

```
Author: Severin Lemaignan <severin.lemaignan@plymouth.ac.uk>
```

```
Date:   Wed Feb 10 16:48:22 2016 +0000
```

```
    Move main.cpp to src/
```

```
commit aff81119459d9193c09effef1c150c4f7eac08dc
```

```
Author: Severin Lemaignan <severin.lemaignan@plymouth.ac.uk>
```

```
Date:   Wed Feb 10 16:48:02 2016 +0000
```

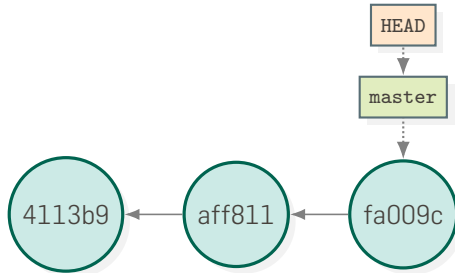
```
    Re-trained model with 52 more participants
```

```
commit 4113b9b6e6bbc8de532ad90153e0059cb5819de7
```

```
Author: Severin Lemaignan <severin.lemaignan@plymouth.ac.uk>
```

```
Date:   Wed Feb 10 16:47:46 2016 +0000
```

```
    Fix computation of position (float->double)
```



THE STAGING AREA

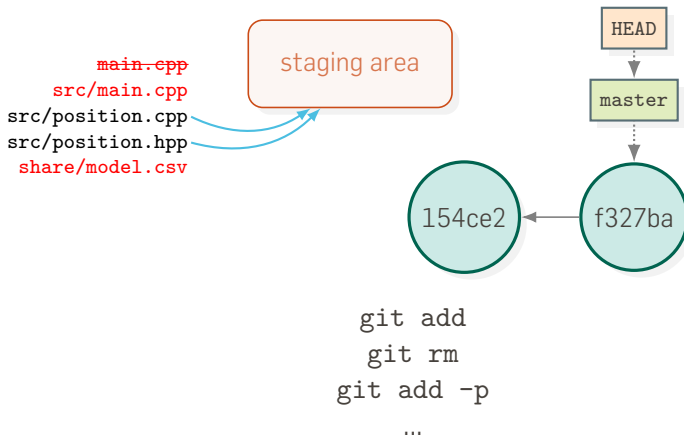
But why do we have to manually tell Git what files to add or remove?

THE STAGING AREA

No “commit all changes” by default (well, you can, actually...)
⇒ Help thinking in terms of atomic commits!

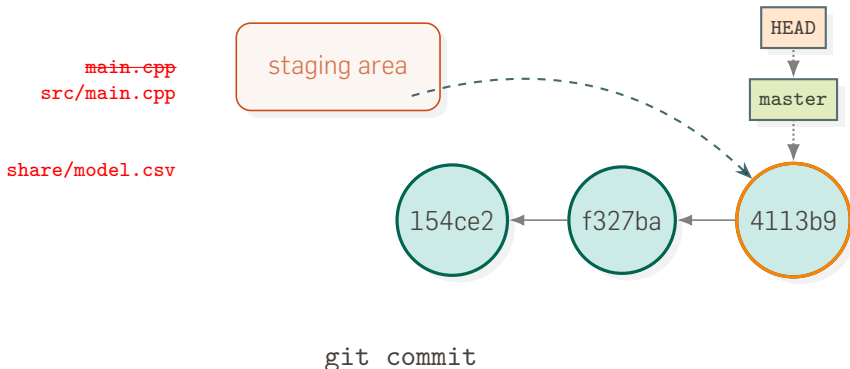
THE STAGING AREA

Preparing a commit consists in filling the **staging area** (or **index**) with the list of changes:



THE STAGING AREA

Preparing a commit consists in filling the **staging area** (or **index**) with the list of changes:



TO SUMMARIZE...

The first time...

```
$ mkdir my_repo && cd my_repo  
$ git init
```

Then...

```
# make some changes...  
$ git add <files>  
$ git commit -m"<commit message>"  
# make some changes...  
$ git add <files>  
$ git commit -m"<other commit message>"  
# That's it!
```

Viewed from a GUI (macOS & Windows)
GitHub Desktop Walkthrough

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



Filter repositories

Tutorial



Welcome

Log in

Configure

Repositories

GitHub GitHub Enterprise

The best way to build and ship software. [Go to github.com](https://github.com) to sign up for an account



Log in



Skip setup

Log in to your GitHub account

Add

Create

Clone

Name

first-repo

Local path

C:\Users\Severin Lemaignan\Documents\GitHub\first-repo

Browse

Git ignore

Windows

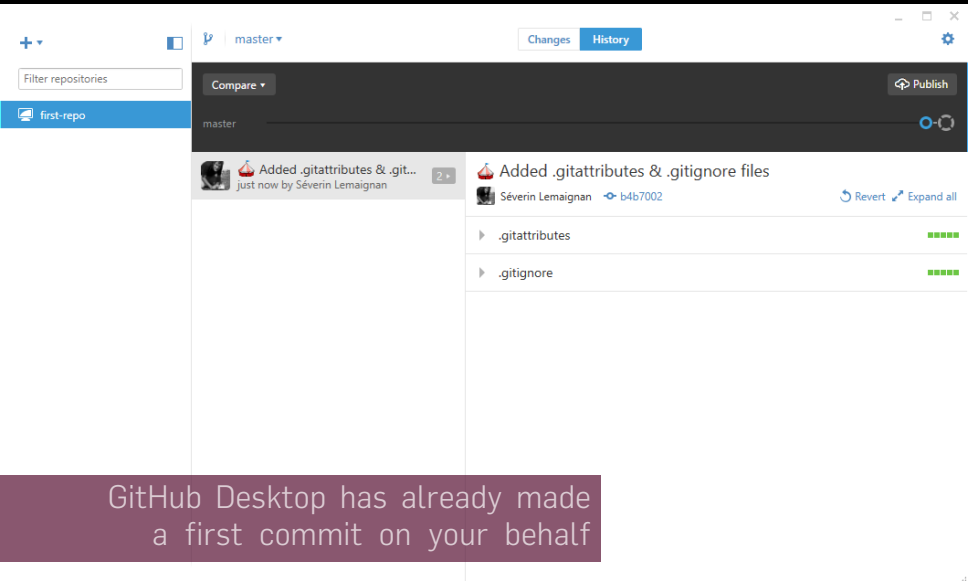
✓

Create repository



Get started by adding a repository.

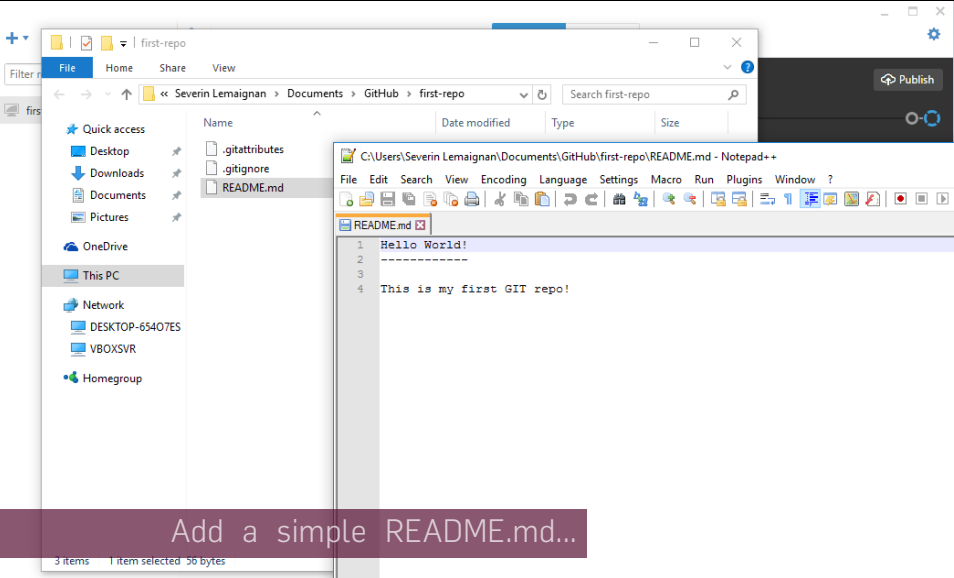
Create a (local) repository



Visual Studio interface showing a Git repository. The repository is named "first-repo". A context menu is open over the repository, showing options: "View on GitHub", "Open in Explorer", "Open in Git Shell", and "Remove". The "Open in Explorer" option is highlighted.

The repository is currently on the "master" branch. The commit history shows a recent commit titled "Added .gitattributes & .gitignore files" by Séverin Lemaignan, committed 1 minute ago. The commit details show two files: ".gitattributes" and ".gitignore", both with green status indicators.

Open the repo in Windows Explorer



Add a simple README.md...

+

Filter repositories

first-repo

master

Compare

View 1 uncommitted change

Publish

master

1 change

✓ README.md

Summary

Description

The change is listed in the Changes panel

+

Filter repositories

first-repo

master

Changes

History

Compare

Publish

master

1 change

✓ README.md

Added a README

Description

Commit to master

Write a commit message & commit!

+

▼

Filter repositories

first-repo

master ▼

Changes

History

Compare ▼

Publish

master

Added a README
just now by Séverin Lemaignan

Added .gitattributes & .git...
8 minutes ago by Séverin Lemaignan

2 ▼

Added a README

Séverin Lemaignan c3e0da2

Revert Collapse all

▼ README.md

...	...	@@ -0,0 +1,4 @@
	1	+ Hello World!
	2	+ -----
	3	+
	4	+ This is my first GIT repo!
1	5	\ No newline at end of file

The History panel shows the log and a diff of your changes

Undo

Created commit: 'Added a README'

Viewed from a GUI
Tortoise GIT

<https://tortoisegit.org/>



Direct interaction in the Windows explorer



normal



assume-valid



added



normal.cpp



assume-valid.cpp



added.cpp



modified



deleted



ignored



modified.cpp



deleted.cpp



ignored.cpp



conflicted



skip-worktree



non-versioned



conflicted.cpp

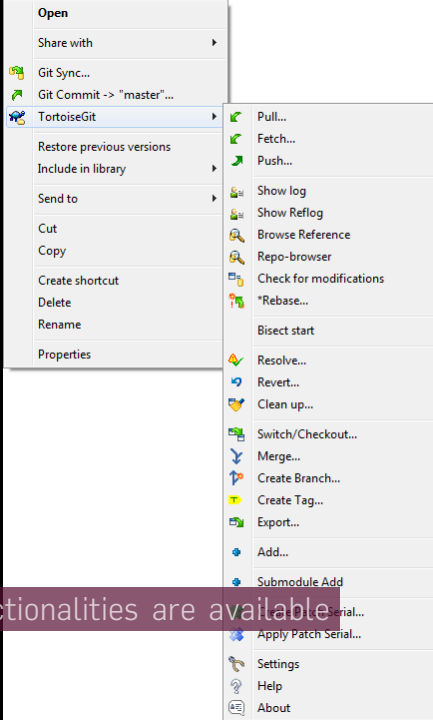


skip-worktree.cpp

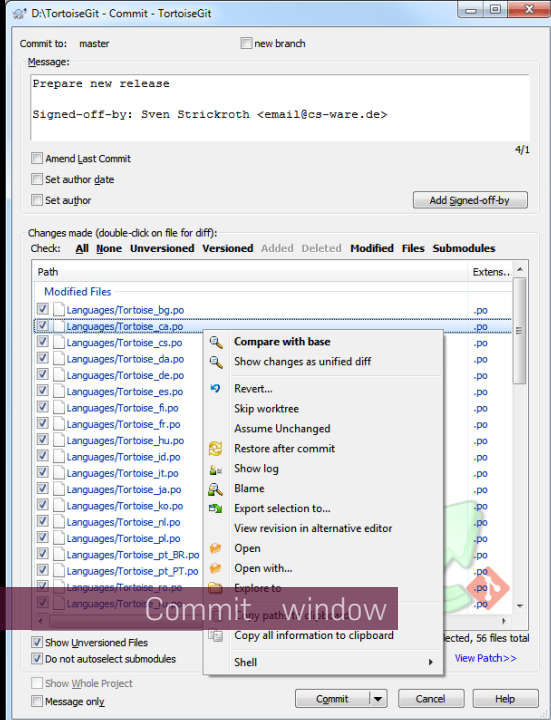


non-versioned.cpp

Files' status appear as icons



All the functionalities are available



WHAT SHOULD BE TRACKED?

Short answer: **everything you care about in your project**

WHAT SHOULD BE TRACKED?

Short answer: **everything you care about in your project**

(you can left out temporary files, automatically generated files, etc)

WHAT SHOULD BE TRACKED?

Short answer: **everything you care about in your project**

(you can left out temporary files, automatically generated files, etc)

However, versioning is **less useful for binary files**:

- no line-by-line tracking of changes
- every single change creates a whole copy: repo size might grow quickly!

Binary files include images, archives (zip files), **PDF, most office document (docx/xlsx/pptx)**

WHAT SHOULD BE TRACKED?

Short answer: **everything you care about in your project**

(you can left out temporary files, automatically generated files, etc)

However, versioning is **less useful for binary files**:

- no line-by-line tracking of changes
- every single change creates a whole copy: repo size might grow quickly!

Binary files include images, archives (zip files), **PDF, most office document (docx/xlsx/pptx)**

For documents, you might want to consider alternative like markdown.

File Home Share View

Clipboard: Pin to Quick access, Copy, Paste

Organize: Move to, Delete, Copy to, Rename

New: New folder

Open: Properties

Select: Select all, Select none, Invert selection

← → ↑ ↓ publications > jnnr2015-CoWriter > Search jnnr2015-CoWriter

	Name	Date modified	Type	Size
Desktop	.git	11/5/2014 1:29 PM	File folder	
Downloads	figures	11/5/2014 12:39 PM	File folder	
Documents	lemaignan2014being.pdf	11/5/2014 1:29 PM	PDF File	5,11
Pictures	library.bib	11/5/2014 12:39 PM	BIB File	7
roco	library.bib.bak	11/5/2014 12:39 PM	BAK File	7
figs	main.aux	11/5/2014 1:29 PM	AUX File	
part5	main.bbl	11/5/2014 1:16 PM	BBL File	
tony's slides	main.blg	11/5/2014 1:16 PM	Performance Mon...	
OneDrive	main.log	11/5/2014 1:29 PM	Text Document	3
This PC	main.new.tex	11/5/2014 12:39 PM	TEX File	5
Network	main.out	11/5/2014 1:29 PM	OUT File	
DESKTOP-65407	main.pdf	11/5/2014 1:29 PM	PDF File	5,11
MP-TECRA-A50	main.tex	11/5/2014 1:29 PM	TEX File	1
VBOXSVR	Makefile	11/5/2014 12:39 PM	File	
\\VBOXSVR\Dr	sig-alternate.cls	11/5/2014 12:39 PM	CLS File	5
\\VBOXSVR\ub	sig-alternate.cls	11/5/2014 12:39 PM	PY File	
Homegroup				

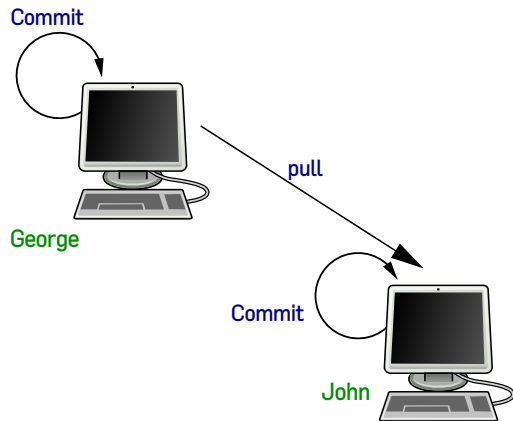
What should I track here?

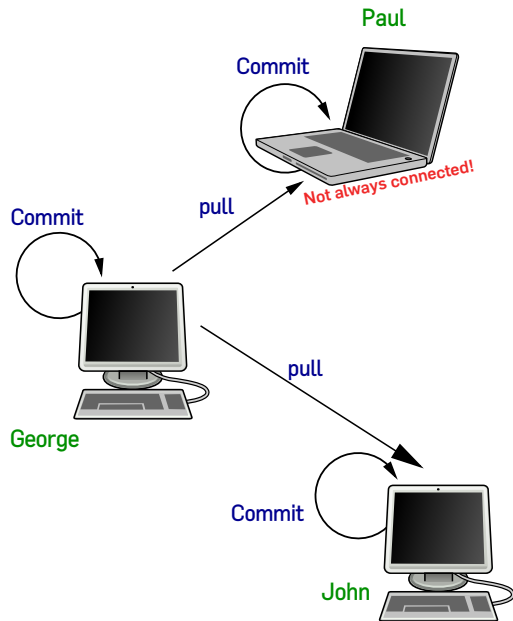
COLLABORATING

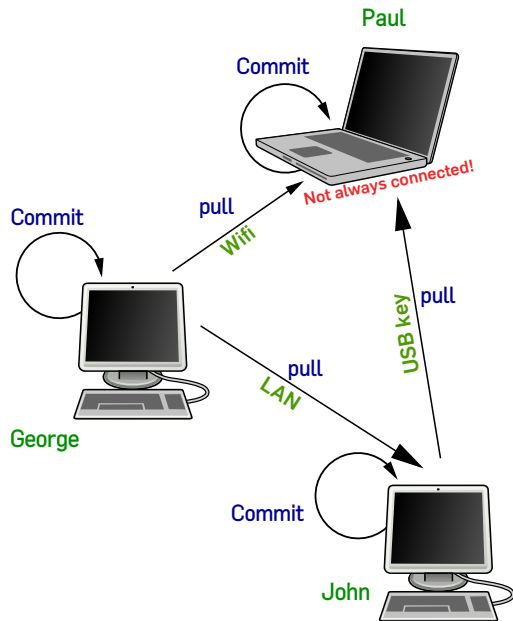
Commit

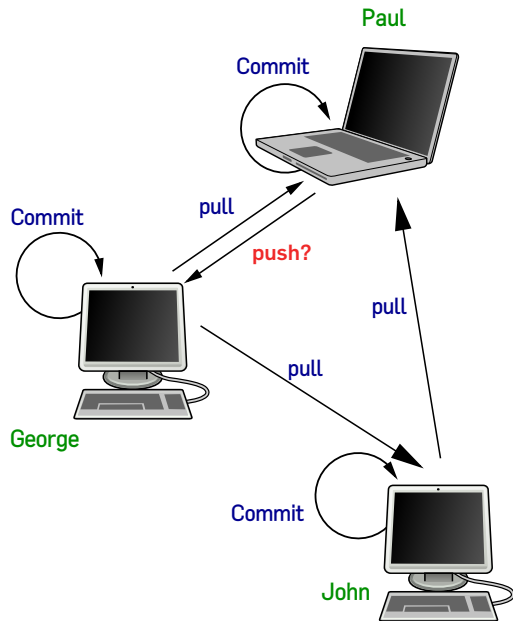


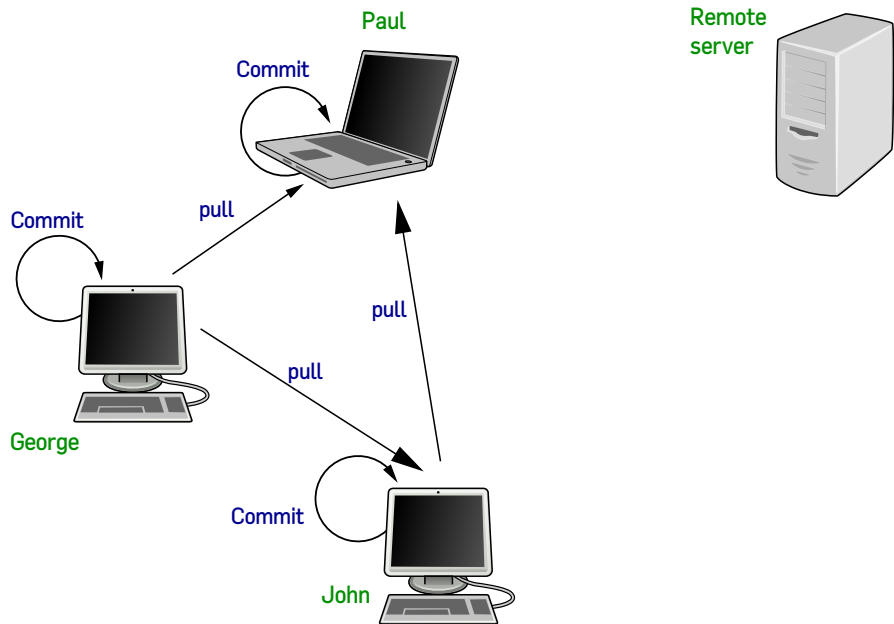
George



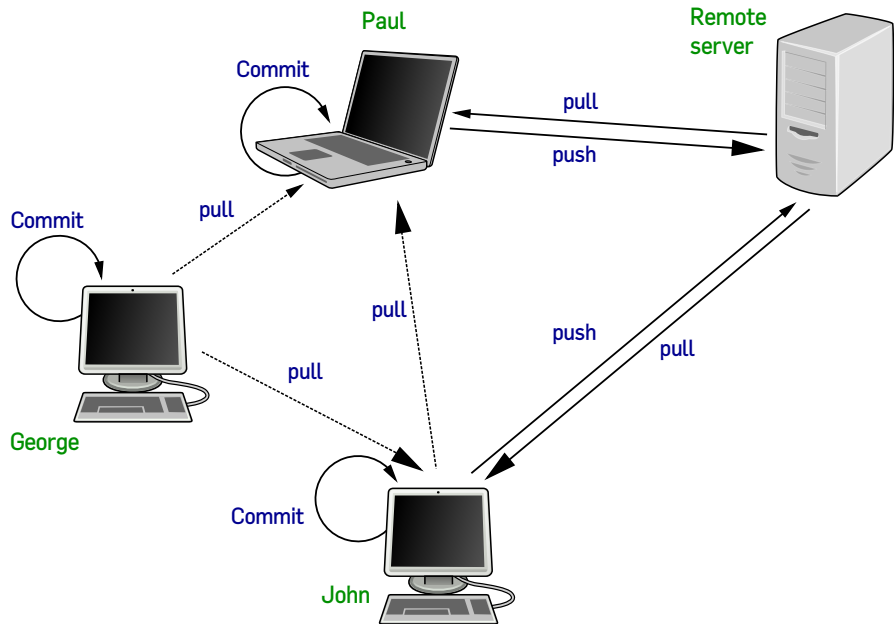




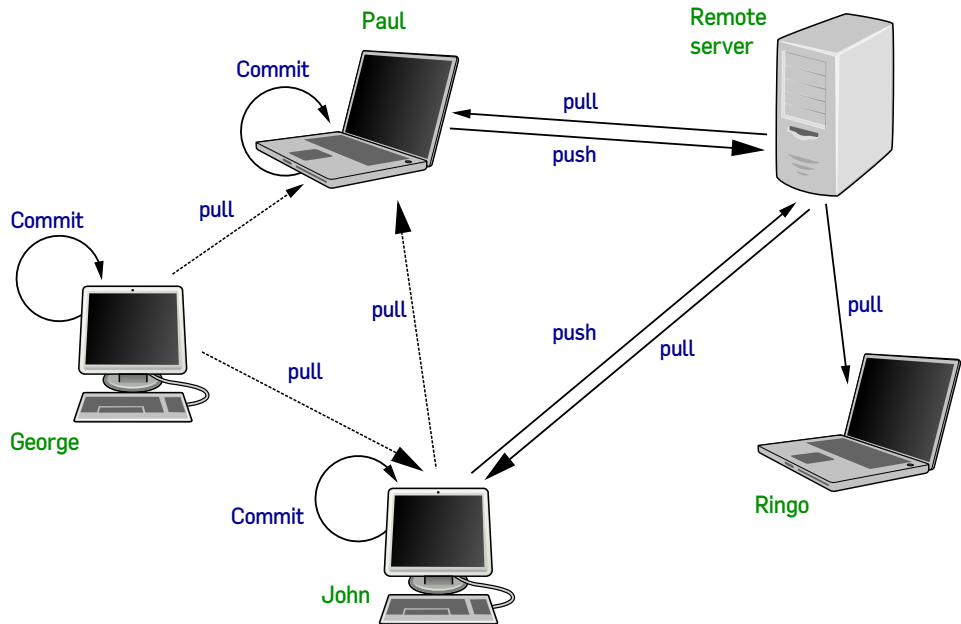


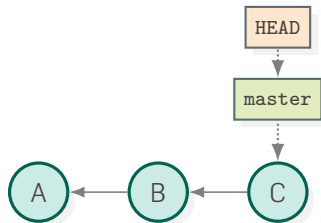


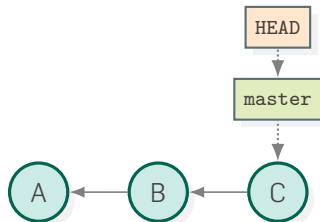
Based on a figure by M. Herrb, CC-BY-SA 3.0



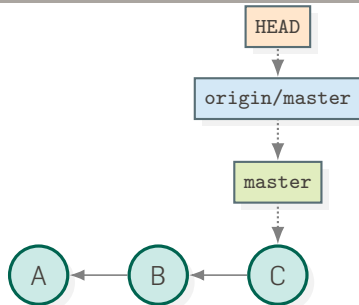
Based on a figure by M. Herrb, CC-BY-SA 3.0





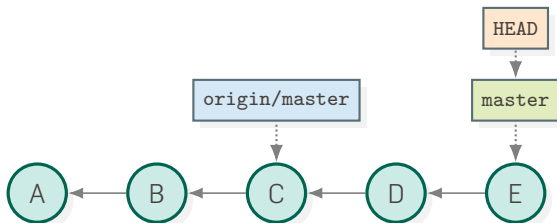


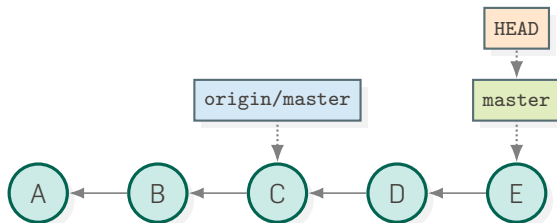
```
git remote add origin git@github.com:user/repo.git
git remote add john-usb E:\john_repo
git remote add ftp-origin ftp://host.xz/path/to/repo.git/
...
```



```
git push origin master
```

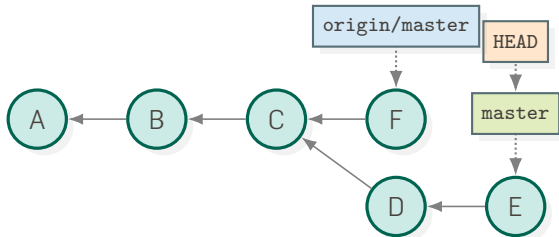
(or simply `git push`)

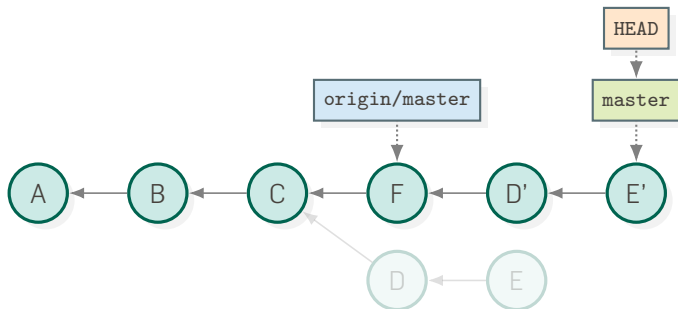




What happened on our remote? Let's have a look...

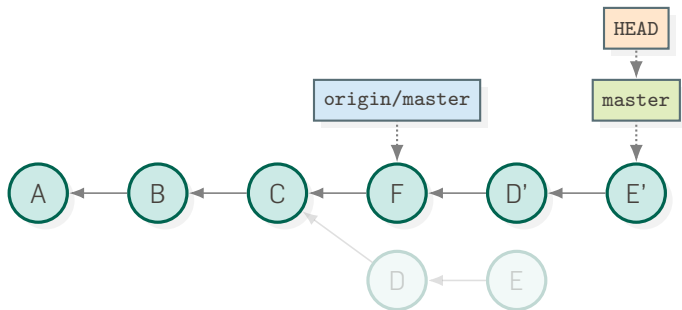
```
git fetch origin
```



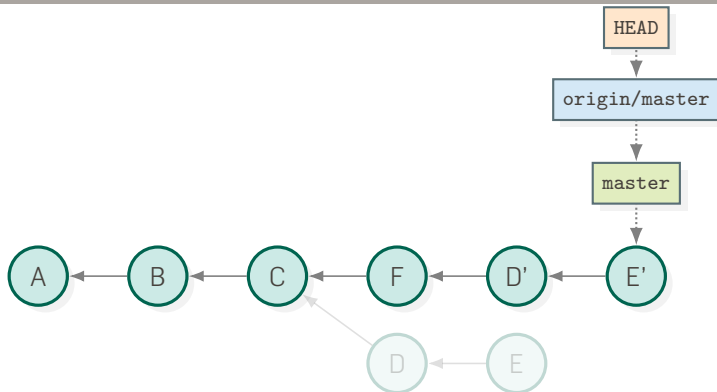


```
git rebase origin/master
```

(but you don't need it, because...)



```
git pull --rebase
```



`git push`

TO SUMMARIZE...

The first time...

```
$ git clone <url>  
# for instance,  
# git clone https://github.com/user/repo.git
```

Then...

```
$ cd <repo>  
# make some changes...  
$ git add <files>  
$ git commit -m"<commit message>"  
# ...  
# when you want to share:  
$ git pull --rebase # any changes on the remote?  
$ git push
```

THE DREADFUL CONFLICTS

THE DREADFUL CONFLICT

While peacefully editing your last (great) paper...

```
$ git pull --rebase john master
```

```
First, rewinding head to replay your work on top of it...
```

```
Applying: Better terminology
```

```
Using index info to reconstruct a base tree...
```

```
M      main.tex
```

```
Falling back to patching base and 3-way merge...
```

```
Auto-merging main.tex
```

```
CONFLICT (content): Merge conflict in main.tex
```

```
error: Failed to merge in the changes.
```

```
Patch failed at 0001 Better terminology
```

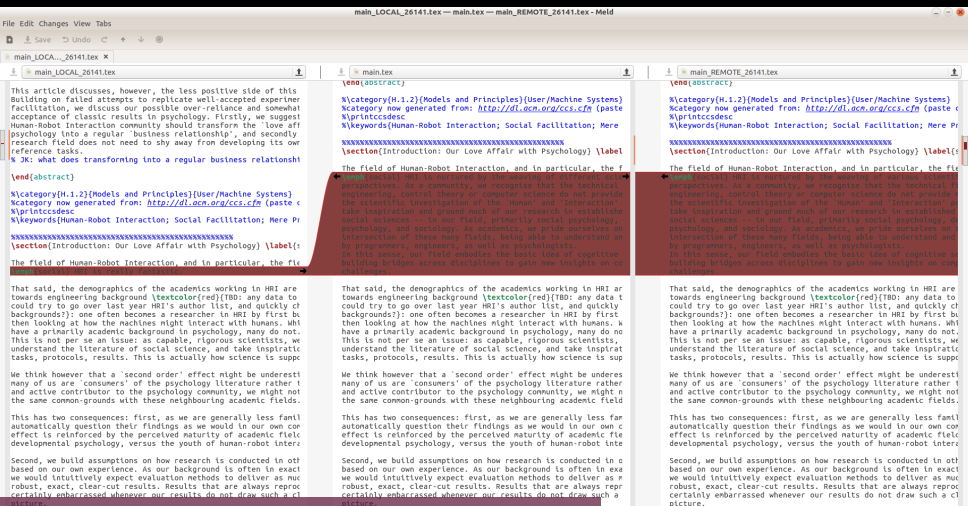
```
The copy of the patch that failed is found in: .git/rebase-ap
```

When you have resolved this problem, run `git rebase --continue`

If you prefer to skip this patch, run `git rebase --skip` instead.

To check out the original branch and stop rebasing, run `git checkout`

```
$ git pull --rebase john master  
# conflict!  
$ git mergetool
```



SOCIAL CODING: GITHUB WORKFLOW



This repository Search

Pull requests Issues Gist



morse-simulator / morse

Unwatch 28

Unstar 145

Fork 74

Code

Issues 69

Pull requests 2

Wiki

Pulse

Graphs

Settings

The Modular OpenRobots Simulation Engine <http://morse-simulator.github.io/> — Edit

4,174 commits

10 branches

53 releases

30 contributors

Branch: master

New pull request

New file

Find file

HTTPS

<https://github.com/morse>



Download ZIP

adegroote [doc]	Document more middleware addition	Latest commit 38fa4af 3 days ago
addons	[builder] fix few occurrences of removed method	a year ago
bin	[bin/morse_sync] Make sure to call it with the same python exec than ...	6 days ago
bindings	[bindings] Prepare for 1.4	7 days ago
config	[cmake] python 3.5 exists since September 2015	a month ago
data	[human] Removes all the code and support for the legacy human avatar	a month ago
doc	[doc] Document more middleware addition	3 days ago
examples	[builder] Rename Environment.set_simulator_frequency in Environemnt.s...	8 days ago
src	[mw/mavlink] Make sure to match only message of the 'good' type	3 days ago
testing	[builder] Rename Environment.set_simulator_frequency in Environemnt.s...	8 days ago
tools	[human] Removes all the code and support for the legacy human avatar	a month ago
.gitignore	add scene."blend and eclipse files to gitignore	3 years ago
.mailmap	Added a mailmap to group variants of dev emails	3 years ago
.travis.bash	[travis] Upgrade the architecture for trusty	4 months ago
.travis.yml	[travis] Upgrade the architecture for trusty	4 months ago
AUTHORS	[doc] Fix several typos in credits	7 days ago
CITATION	[doc] Added a CITATION file	3 years ago
CMakeLists.txt	[bin/morse_sync] Make sure to call it with the same python exec than ...	6 days ago

GitHub



MakeHuman

ACTIONS

- Clone
- Compare
- Fork

NAVIGATION

- Overview
- Source
- Commits
- Branches
- Pull requests
- Downloads

1

Séverin Lemaignan / MakeHuman

Source

default MakeHuman /

blendertools

buildscripts

docs

makehuman

maketarget-standalone

.hgeol	23 B	2014-02-03	Ensure use of LF native line endings for all text files, to avoid careless windows developers changing the line endings.
.hgignore	574 B	2014-03-18	merge with stable
.hgtags	47 B	2014-03-15	Cleanup hgtags
README	1.5 KB	2014-03-23	Add url to development tracker for dev status to readme

MakeHuman

=====

Makehuman is a completely free, innovative and professional software for the modelling of 3-Dimensional humanoid characters. This is the official source repository of the MakeHuman project.

Official website: <http://www.makehuman.org>
Development status: <http://bugtracker.makehuman.org>

License

MakeHuman's source code and its mesh data is distributed freely under the AGPL3 license (see license.txt). Content created using the MakeHuman application is released under the liberal CC0 license. For more details, refer to these pages:

* https://www.makehuman.org/doc/node/the_makehuman_application.html


* https://www.makehuman.org/doc/node/makehuman_mesh_license.html

licenses for dependencies are included in the licenses folder.

Instructions

BitBucket

<<

GitLab

Back to Group

Project

Activity

Files

Commits

Network

Graphs

Milestones

Issues712

Merge Requests52

Labels


gitlab.com

GitLab.org / GitLab Community Edition

Search in this project

mastergitlab-ceDownload zip

Name	Last Update	Last Commit > 6ae806b1 – Merge branch 'fix-link-to-2fa' into 'master'	History
app	a day ago	Achilleas Pipinellis Fix link to 2fa help page. Closes #2055	
bin	2 months ago	Robert Spelcher Remove Guard	
config	3 days ago	Marin Jankovski Merge branch 'set-omniauth-full-host' into 'mast...	
db	about 23 hours ago	Marin Jankovski Check if session_expire_delay column exists bef...	
doc	a day ago	Marin Jankovski Merge branch 'master' of gitlab.com:gitlab-org/g...	
docker	7 days ago	Job van der Voort Merge branch 'chef-docker' into 'master'	
features	6 days ago	Stan Hu Add support for destroying project milestones	
lib	2 days ago	Jacob Vosmaer Don't stop if database.sql.gz already exists	
log	4 years ago	gitlabhq init commit	
public	about a month ago	Dmitriy Zaporozhets Replace old logo with new one	
scripts	28 days ago	Kamil Trzcinski Added missing packages required by docker builds	
vendor/assets	9 days ago	Robert Spelcher Merge branch 'rs-security-spec-speed' into 'master'	
	about a year ago	Robert Spelcher Make sure important directories exist in git	
		Dmitriy Zaporozhets Add nice scroll for sidebar	

darby

GitLab – open-source You can install it on your own server



This repository Search

Pull requests Issues Gist



morse-simulator / morse

Unwatch 28

Unstar 145

Fork 74

Code

Issues 69

Pull requests 2

Wiki

Pulse

Graphs

Settings

The Modular OpenRobots Simulation Engine <http://morse-simulator.github.io/> — Edit

4,174 commits

10 branches

53 releases

30 contributors

Branch: master

New pull request

New file

Find file

HTTPS

<https://github.com/morse>



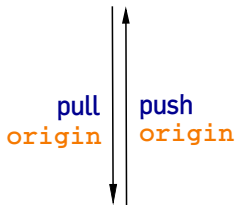
Download ZIP

adegroote [doc] Document more middleware addition

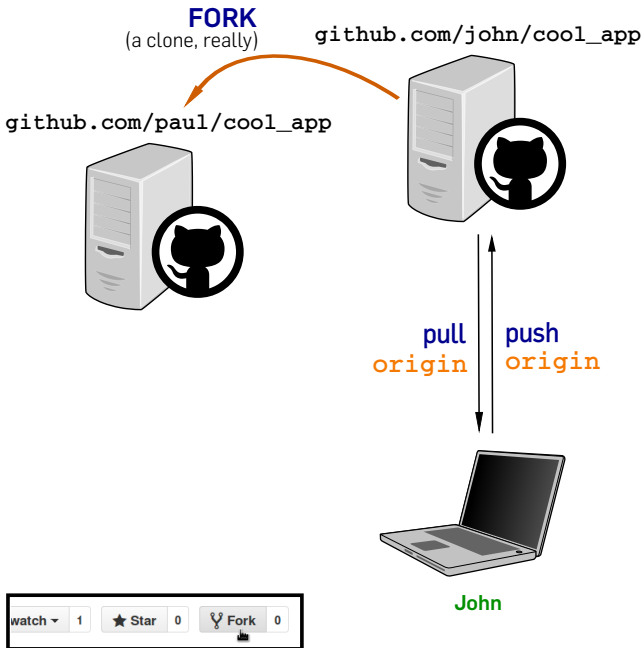
Latest commit 38fa4af 3 days ago

addons	[builder] fix few occurrences of removed method	a year ago
bin	[bin/morse_sync] Make sure to call it with the same python exec than ...	6 days ago
bindings	[bindings] Prepare for 1.4	7 days ago
config	[cmake] python 3.5 exists since September 2015	a month ago
data	[human] Removes all the code and support for the legacy human avatar	a month ago
doc	[doc] Document more middleware addition	3 days ago
examples	[builder] Rename Environment.set_simulator_frequency in Environemnt.s...	8 days ago
src	[mw/mavlink] Make sure to match only message of the 'good' type	3 days ago
testing	[builder] Rename Environment.set_simulator_frequency in Environemnt.s...	8 days ago
tools	[human] Removes all the code and support for the legacy human avatar	a month ago
.gitignore	add scene."blend and eclipse files to gitignore	3 years ago
.mailmap	Added a mailmap to group variants of dev emails	3 years ago
.travis.bash	[travis] Upgrade the architecture for trusty	4 months ago
.travis.yml	[travis] Upgrade the architecture for trusty	4 months ago
AUTHORS	[doc] Fix several typos in credits	7 days ago
CITATION	[doc] Added a CITATION file	3 years ago
CMakeLists.txt	[bin/morse_sync] Make sure to call it with the same python exec than ...	6 days ago

github.com/john/cool_app

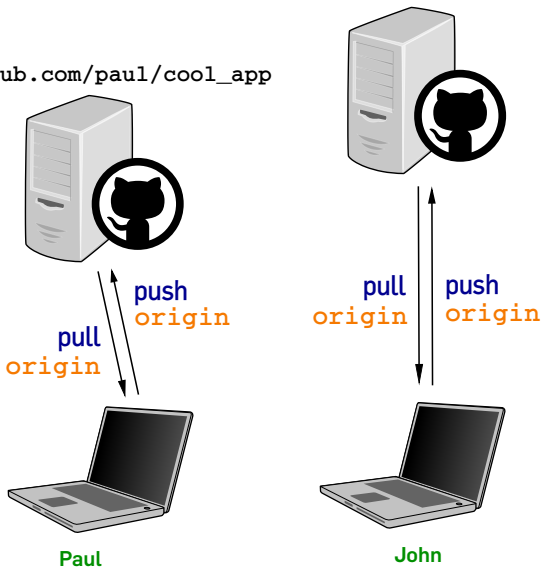


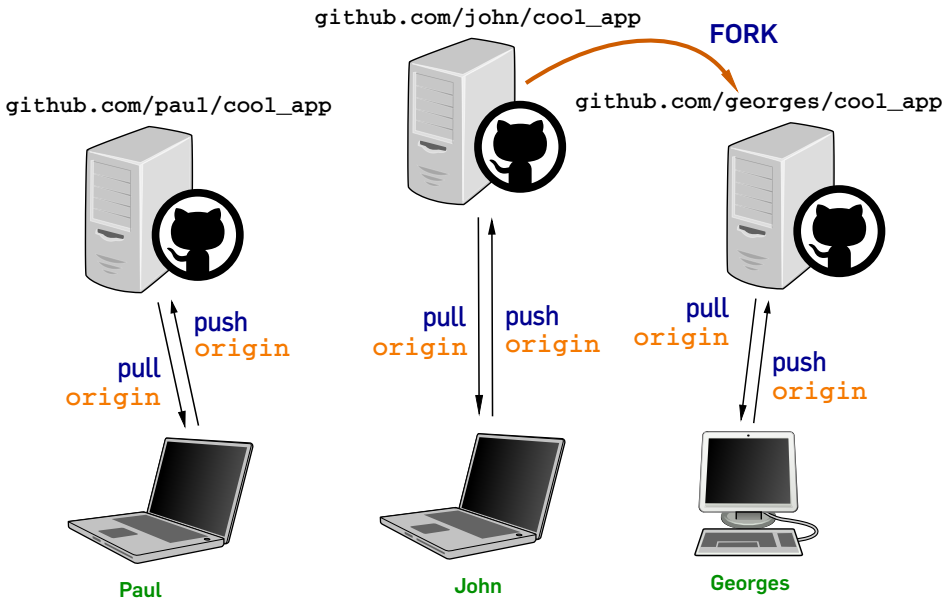
John



github.com/john/cool_app

github.com/paul/cool_app

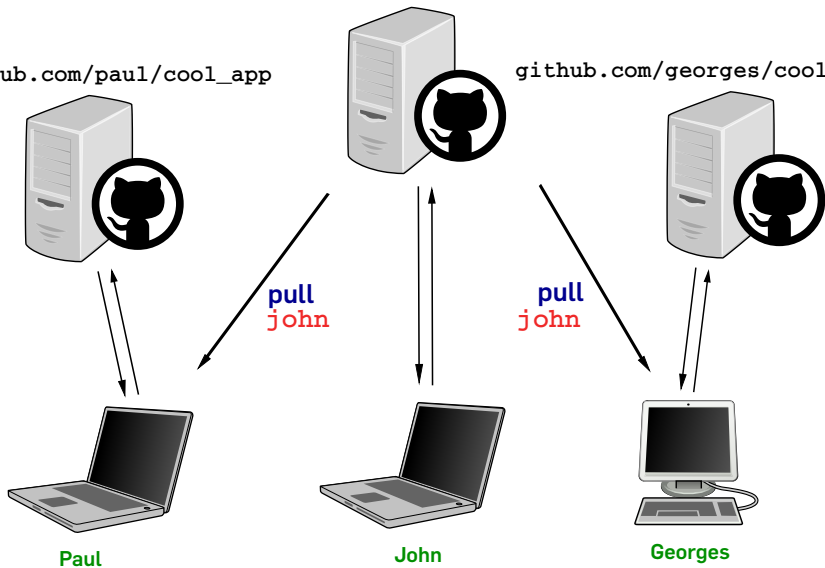


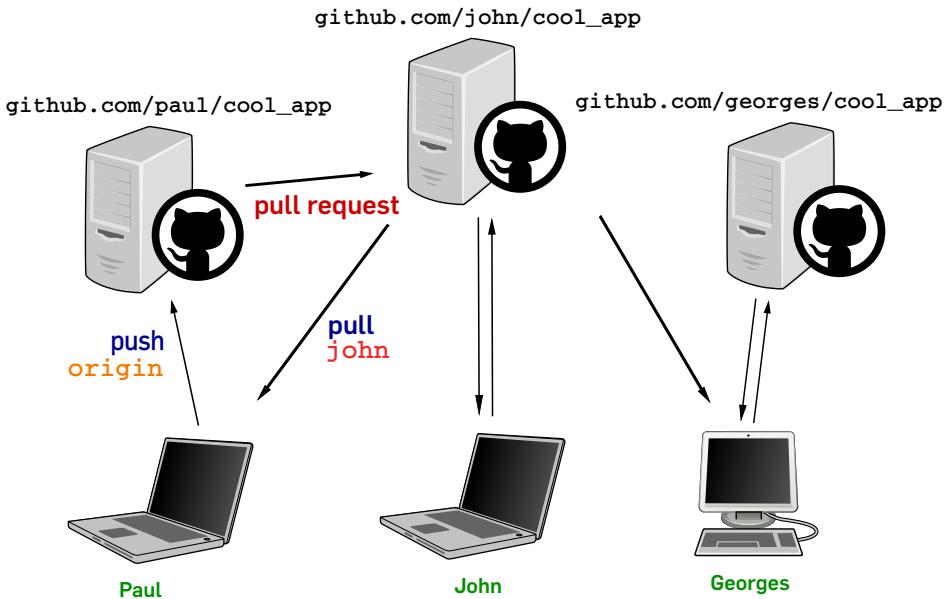


github.com/john/cool_app

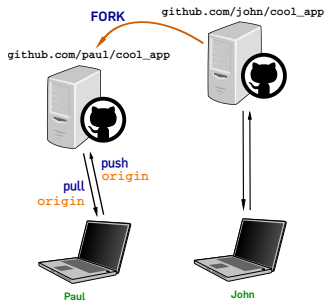
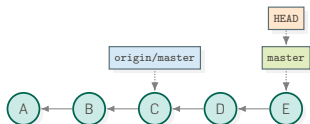
github.com/paul/cool_app

github.com/georges/cool_app





WHAT HAPPENED EXACTLY?

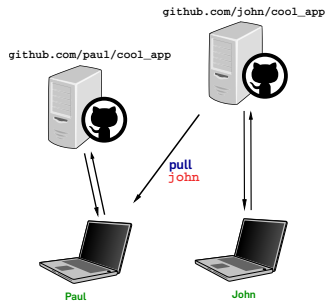
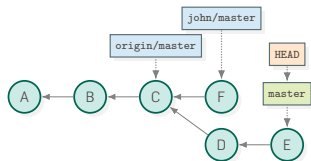


After forking on GitHub, Paul runs

```
git clone https://github.com/paul/cool_app.git
```

and he adds few local commits

WHAT HAPPENED EXACTLY?

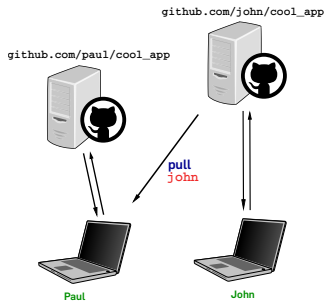
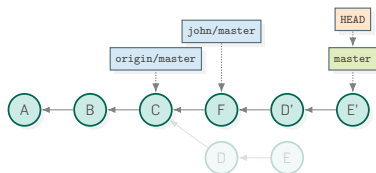


He would like to propose his changes to John

First, he needs to get the latest changes from John:

```
git add remote john https://github.com/john/cool_app.git  
git fetch john
```

WHAT HAPPENED EXACTLY?

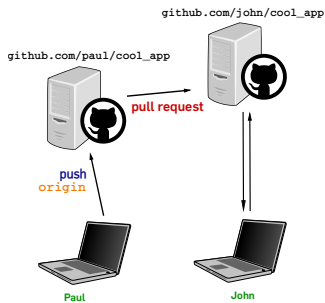
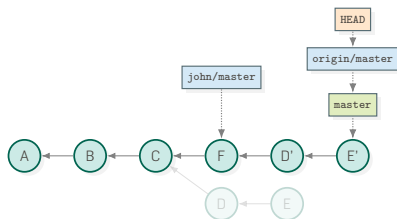


Paul rebases his master branch on John's one:

```
git rebase john/master
```

(actually, Paul would simply run `git pull --rebase john master`)

WHAT HAPPENED EXACTLY?

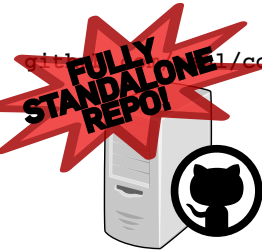


He pushes his commits to his own GitHub account:

```
git push
```

...and finally press the “Create a pull request” button in GitHub.

(what happens next on John's side is a story for another day :-)
But to make it short, he can press "Merge pull request" on his
GitHub account if he is happy with the pull-request!)



Paul



John



Georges

THE ONE SLIDE TO REMEMBER

GIT CHEAT SHEET

To start...

...from scratch: `git init`

...from existing repo: `git clone <url>`

Prepare commits:

`git add`

`git rm`

`git add -p` (partial files)

Commit:

`git commit`

Create branch:

`git checkout -b <branch>`

Jump between branches:

`git checkout <branch>`

"Import" another branch:

`git rebase <other_branch>`

Add a remote source:

`git remote add <name> <url>`

What's new on a remote?

`git pull <remote> <branch>`

(`git pull alone` \equiv `git pull origin master`)

Share stuff on a remote:

`git push <remote> <branch>`

(`git push alone` \equiv `git push origin master`)

Repo state

`git status`

Repo history

`git log`

Who did what?

`git blame`

I've lost everything!

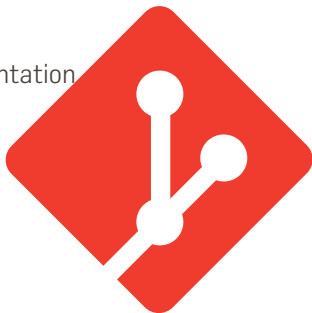
`git reflog`

That's all, folks!

Questions:

Portland Square A216 or **severin.lemaignan@plymouth.ac.uk**

Slides: github.com/severin-lemaignan/git-presentation



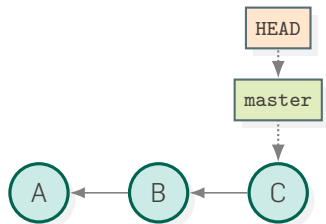
SUPPLEMENTARY MATERIAL

6. Working with branches

7. Etiquette of social coding 101

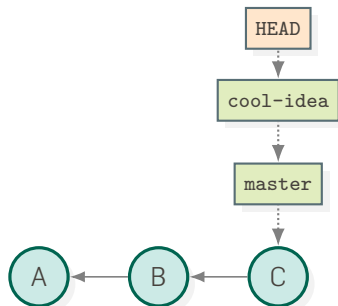
WORKING WITH BRANCHES

BRANCHES



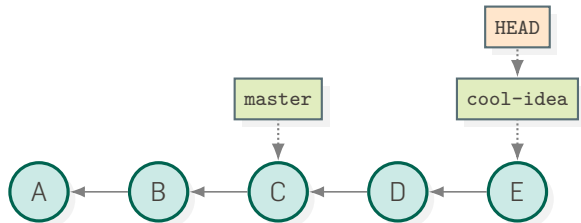
What if...?

BRANCHES

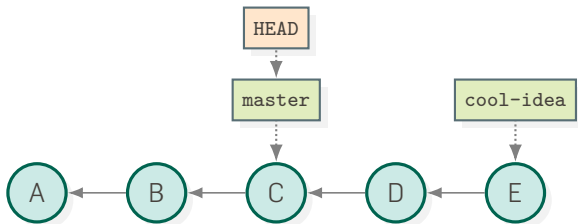


```
git checkout -b cool-idea
```

BRANCHES

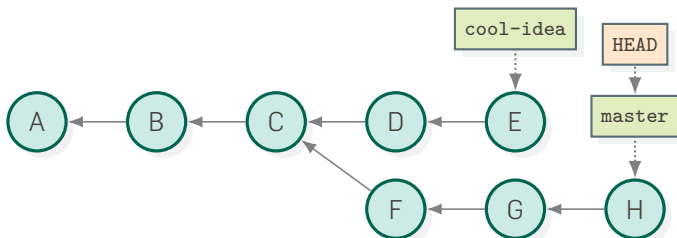


BRANCHES



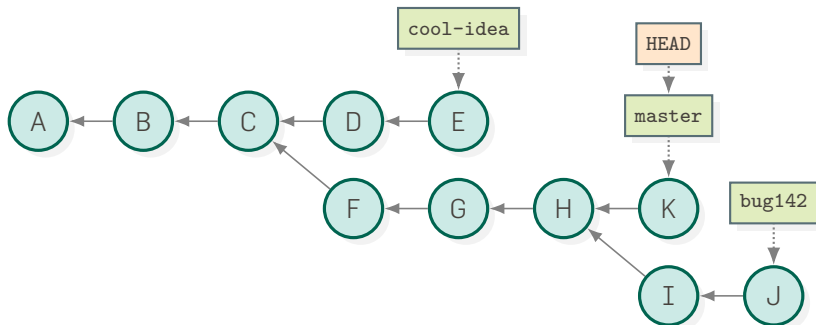
Let go back to serious stuff!
`git checkout master`

BRANCHES



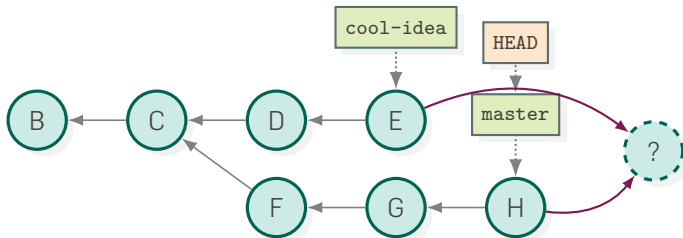
The branch name is an alias for the tip of the current branch

BRANCHES



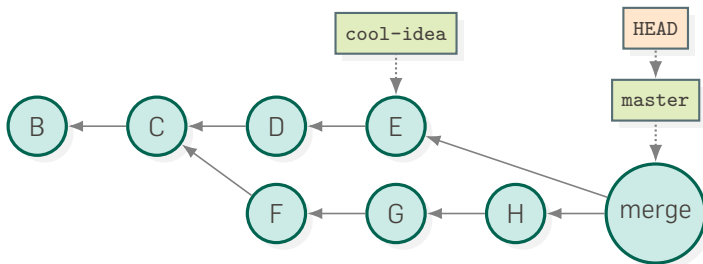
⇒ branches are very cheap
+10 of them at a given time it not uncommon

MERGING BRANCHES



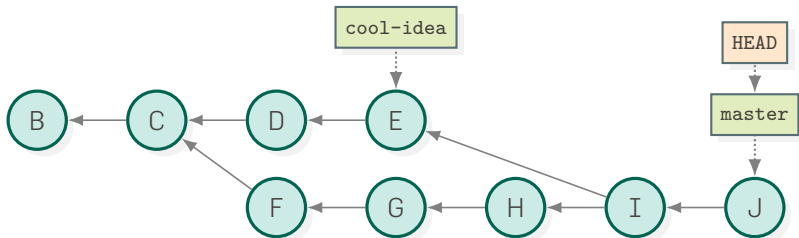
Two options: **merging** and **rebasing**

MERGING BRANCHES



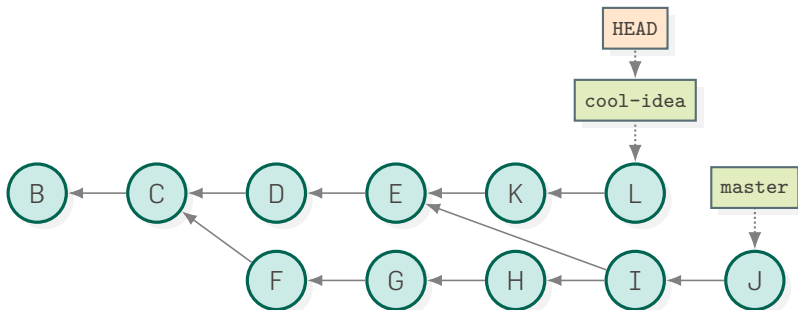
Merging
`git merge cool-idea`

MERGING BRANCHES



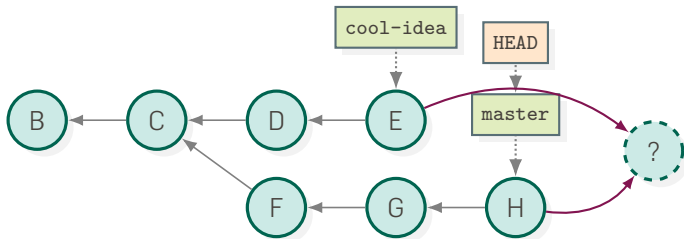
```
git commit
```

MERGING BRANCHES

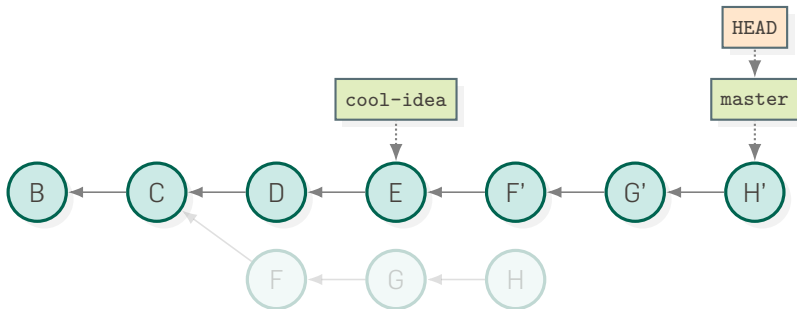


```
git checkout cool-idea
git commit
...etc.
```

REBASING BRANCHES

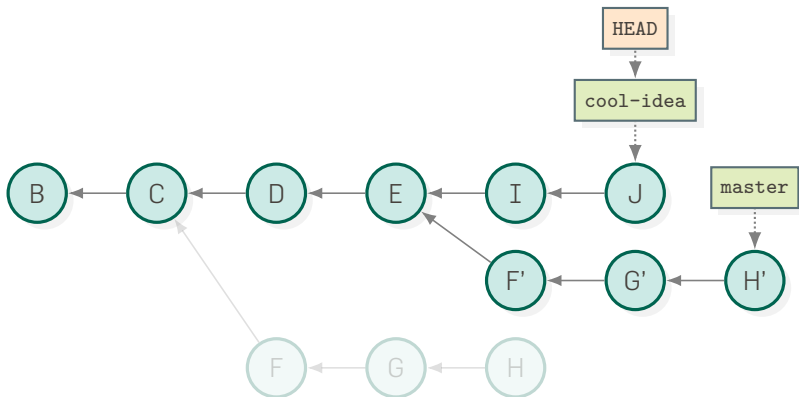


REBASING BRANCHES



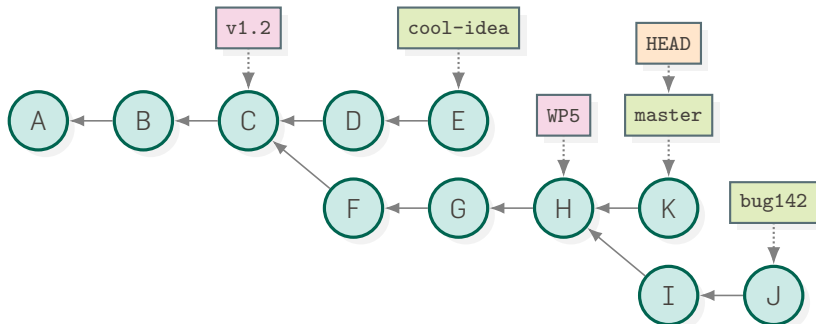
Rebasing
`git rebase cool-idea`

REBASING BRANCHES



```
git checkout cool-idea  
git commit
```

MORE COMMIT ALIASES: TAGS



Label important commits/milestones

```
git tag v1.2
```

```
git tag WP5
```

TO SUMMARIZE...

```
# where are we?
$ git branch
master
# make some changes...
$ git add <files> && git commit -m"<commit message>"
# start working on something new?
$ git checkout -b new-idea
$ git branch
new-idea
# work in that branch for a while
$ git add <files> && git commit -m"<commit message>"
# back to master
$ git checkout master
#...
# rebase master on new-idea: new-idea is now in master
$ git rebase new-idea
```

Viewed from a GUI...

Filter repositories

first-repo

master

ChangesHistory

numerical_coordinates

From branch master

Create new branch

Testing the rendering of a grid
4 hours ago by Séverin Lemaignan

Added a basic main()
5 hours ago by Séverin Lemaignan

Initial commit -- just a README
5 hours ago by Séverin Lemaignan

oved grid rendering with coordinates

Séverin Lemaignan da25158

RevertCollapse all

main.cpp

```
... @@ -16,7 +16,9 @@ int main(int argc, char** argv) {
16 16     while(!done) {
17 17
18 18         char i = 0;
19 - cout << "-----" << endl;
19 + cout << " A B C " << endl;
20 + cout << " -----" << endl;
21 + cout << "1";
20 22
21 23     for(auto pos : positions) {
22 24         i++;
... @@ -24,7 +26,8 @@ int main(int argc, char** argv) {
24 26
25 27         if (i % 3 == 0) {
26 28             cout << "|" << endl;
27 - cout << "-----" << endl;
27 + cout << " -----" << endl;
28 + cout << i/3 + 1;
28 31
29 32     }
```

We can easily create a new branch

+

Filter repositories

first-repo

numerical_coordinates

Changes

History

Update from master

View branch

Publish

master

numerical_coordinates

Switch to numerical coordinates
just now by Séverin Lemaignan

Switch to numerical coordinates

Séverin Lemaignan 8f6ef0f

Revert Collapse all

main.cpp

...	...	@@ -16,7 +16,7 @@	int main(int argc, char** argv) {
16	16		while(!done) {
17	17		
18	18		char i = 0;
19	-		cout << " A B C " << endl;
	19	+	cout << " 1 2 3 " << endl;
20	20		cout << " -----" << endl;
21	21		cout << "1";
22	22		

We can compare numerical_co-ordinates with master (click on View branch for the full history)

Visual Studio Code interface showing a repository named `numerical_coordinates`. The interface includes a sidebar with a "Filter" input, a list of repositories (including `first-repo`), and a dropdown menu for branches. The dropdown menu shows "Recent branches" with `numerical_coordinates` selected and `master` listed below. The main editor displays a C++ file named `main.cpp` with the following code:

```
... @@ -16,7 +16,7 @@ int main(int argc, char** argv) {
16     while(!done) {
17
18         char i = 0;
19 -        cout << " A B C " << endl;
20 +        cout << " 1 2 3 " << endl;
21         cout << " -----" << endl;
22         cout << "1";
```

The interface also shows a "Changes" tab, a "History" tab, and a "Publish" button.

We can jump between branches...

Filter repositories

first-repo

master

Changes

History

Update from numerical_coordinates

View branch

Publish

numerical_coordinates

master

Read user input

just now by Séverin Lemaignan

Improved grid rendering with coordi...

5 hours ago by Séverin Lemaignan

Testing the rendering of a grid

5 hours ago by Séverin Lemaignan

Added a basic main()

5 hours ago by Séverin Lemaignan

Initial commit -- just a README

5 hours ago by Séverin Lemaignan

Read user input

just now by Séverin Lemaignan

Revert

Commit

main.cpp

78ceac7

@@ -13,6 +13,10 @@ int main(int argc, char** argv) {

13 13 0,1,0,

14 14 0,0,1};

15 15

16 + char x_char;

17 + int x;

18 + int y;

19 +

16 20 while(!done) {

17 21 char i = 0;

18 22

19 23

20 24

21 25

22 26

23 27

24 28

25 29

26 30

27 31

28 32

29 33

30 34

31 35

32 36

33 37

34 38

35 39

36 40

37 41

38 42

39 43

40 44

41 45

42 46

43 47

44 48

45 49

46 50

47 51

48 52

49 53

50 54

51 55

52 56

53 57

54 58

55 59

56 60

57 61

58 62

59 63

60 64

61 65

62 66

63 67

64 68

65 69

66 70

67 71

68 72

69 73

70 74

71 75

72 76

73 77

74 78

75 79

76 80

77 81

78 82

79 83

80 84

81 85

82 86

83 87

84 88

85 89

86 90

87 91

88 92

89 93

90 94

91 95

92 96

93 97

94 98

95 99

96 100

97 101

98 102

99 103

100 104

101 105

102 106

103 107

104 108

105 109

106 110

107 111

108 112

109 113

110 114

111 115

112 116

113 117

114 118

115 119

116 120

117 121

118 122

119 123

120 124

121 125

122 126

123 127

124 128

125 129

126 130

127 131

128 132

129 133

130 134

131 135

132 136

133 137

134 138

135 139

136 140

137 141

138 142

139 143

140 144

141 145

142 146

143 147

144 148

145 149

146 150

147 151

148 152

149 153

150 154

151 155

152 156

153 157

154 158

155 159

156 160

157 161

158 162

159 163

160 164

161 165

162 166

163 167

164 168

165 169

166 170

167 171

168 172

169 173

170 174

171 175

172 176

173 177

174 178

175 179

176 180

177 181

178 182

179 183

180 184

181 185

182 186

183 187

184 188

185 189

186 190

187 191

188 192

189 193

190 194

191 195

192 196

193 197

194 198

195 199

196 200

197 201

198 202

199 203

200 204

201 205

202 206

203 207

204 208

205 209

206 210

207 211

208 212

209 213

210 214

211 215

212 216

213 217

214 218

215 219

216 220

217 221

218 222

219 223

220 224

221 225

222 226

223 227

224 228

225 229

226 230

227 231

228 232

229 233

230 234

231 235

232 236

233 237

234 238

235 239

236 240

237 241

238 242

239 243

240 244

241 245

242 246

243 247

244 248

245 249

246 250

247 251

248 252

249 253

250 254

251 255

252 256

253 257

254 258

255 259

256 260

257 261

258 262

259 263

260 264

261 265

262 266

263 267

264 268

265 269

266 270

267 271

268 272

269 273

270 274

271 275

272 276

273 277

274 278

275 279

276 280

277 281

278 282

279 283

280 284

281 285

282 286

283 287

284 288

285 289

286 290

287 291

288 292

289 293

290 294

291 295

292 296

293 297

294 298

295 299

296 300

297 301

298 302

299 303

300 304

301 305

302 306

303 307

304 308

305 309

306 310

307 311

308 312

309 313

310 314

311 315

312 316

313 317

314 318

315 319

316 320

317 321

318 322

319 323

320 324

321 325

322 326

323 327

324 328

325 329

326 330

327 331

328 332

329 333

330 334

331 335

332 336

333 337

334 338

335 339

336 340

337 341

338 342

339 343

340 344

341 345

342 346

343 347

344 348

345 349

346 350

347 351

348 352

349 353

350 354

351 355

352 356

353 357

354 358

355 359

356 360

357 361

358 362

359 363

360 364

361 365

362 366

363 367

364 368

365 369

366 370

367 371

368 372

369 373

370 374

371 375

372 376

373 377

374 378

375 379

376 380

377 381

378 382

379 383

380 384

381 385

382 386

383 387

384 388

385 389

386 390

387 391

388 392

389 393

390 394

391 395

392 396

393 397

394 398

395 399

396 400

397 401

398 402

399 403

400 404

401 405

402 406

403 407

404 408

405 409

406 410

407 411

408 412

409 413

410 414

411 415

412 416

413 417

414 418

415 419

416 420

417 421

418 422

419 423

420 424

421 425

422 426

423 427

424 428

425 429

426 430

427 431

428 432

429 433

430 434

431 435

432 436

433 437

434 438

435 439

436 440

437 441

438 442

439 443

440 444

441 445

442 446

443 447

444 448

445 449

446 450

447 451

448 452

449 453

450 454

451 455

452 456

453 457

454 458

455 459

456 460

457 461

458 462

459 463

460 464

461 465

462 466

463 467

464 468

465 469

466 470

467 471

468 472

469 473

470 474

471 475

472 476

473 477

474 478

475 479

476 480

477 481

478 482

479 483

480 484

481 485

482 486

483 487

484 488

485 489

486 490

487 491

488 492

489 493

490 494

491 495

492 496

493 497

494 498

495 499

496 500

497 501

498 502

499 503

500 504

501 505

502 506

503 507

504 508

505 509

506 510

507 511

508 512

509 513

510 514

511 515

512 516

513 517

514 518

515 519

516 520

517 521

518 522

519 523

520 524

521 525

522 526

523 527

524 528

525 529

526 530

527 531

528 532

529 533

530 534

531 535

532 536

533 537

534 538

535 539

536 540

537 541

538 542

539 543

540 544

541 545

542 546

543 547

544 548

545 549

546 550

547 551

548 552

549 553

550 554

551 555

552 556

553 557

554 558

555 559

556 560

557 561

558 562

559 563

560 564

561 565

562 566

563 567

564 568

565 569

566 570

567 571

568 572

569 573

570 574

571 575

572 576

573 577

574 578

575 579

576 580

577 581

578 582

579 583

580 584

581 585

582 586

583 587

584 588

585 589

586 590

587 591

588 592

589 593

590 594

591 595

592 596

593 597

594 598

595 599

596 600

597 601

598 602

599 603

600 604

601 605

602 606

603 607

604 608

605 609

606 610

607 611

608 612

609 613

610 614

611 615

612 616

613 617

614 618

615 619

616 620

617 621

618 622

619 623

620 624

621 625

622 626

623 627

624 628

625 629

626 630

627 631

628 632

629 633

630 634

631 635

632 636

633 637

634 638

635 639

636 640

637 641

638 642

639 643

640 644

641 645

642 646

643 647

644 648

645 649

646 650

647 651

648 652

649 653

650 654

651 655

652 656

653 657

654 658

655 659

656 660

657 661

658 662

659 663

660 664

661 665

662 666

663 667

664 668

665 669

666 670

667 671

668 672

669 673

670 674

671 675

672 676

673 677

674 678

675 679

676 680

677 681

678 682

679 683

680 684

681 685

682 686

683 687

684 688

685 689

686 690

687 691

688 692

689 693

690 694

691 695

692 696

693 697

694 698

695 699

696 700

697 701

698 702

699 703

700 704

701 705

702 706

703 707

704 708

705 709

706 710

707 711

708 712

709 713

710 714

711 715

712 716

713 717

714 718

715 719

716 720

717 721

718 722

719 723

720 724

721 725

722 726

723 727

724 728

725 729

726 730

727 731

728 732

729 733

730 734

731 735

732 736

733 737

734 738

735 739

736 740

737 741

738 742

739 743

740 744

741 745

742 746

743 747

744 748

745 749

746 750

747 751

748 752

749 753

750 754

751 755

752 756

753 757

754 758

755 759

756 760

757 761

758 762

759 763

760 764

761 765

762 766

763 767

764 768

765 769

766 770

767 771

768 772

769 773

770 774

771 775

772 776

773 777

774 778

775 779

776 780

777 781

778 782

779 783

780 784

781 785

782 786

783 787

784 788

785 789

786 790

787 791

788 792

789 793

790 794

791 795

792 796

793 797

794 798

795 799

796 800

797 801

798 802

799 803

800 804

801 805

802 806

803 807

804 808

805 809

806 810

807 811

808 812

809 813

810 814

811 815

812 816

813 817

814 818

815 819

816 820

817 821

818 822

819 823

820 824

821 825

822 826

823 827

824 828

825 829

826 830

827 831

828 832

829 833

830 834

831 835

832 836

833 837

834 838

835 839

836 840

837 841

838 842

839 843

840 844

841 845

842 846

843 847

844 848

845 849

846 850

847 851

848 852

849 853

850 854

851 855

852 856

853 857

854 858

855 859

856 860

857 861

858 862

859 863

860 864

861 865

862 866

863 867

864 868

865 869

866 870

867 871

868 872

869 873

870 874

871 875

872 876

873 877

874 878

875 879

876 880

877 881

878 882

879 883

880 884

881 885

882 886

883 887

884 888

885 889

886 890

887 891

888 892

889 893

890 894

891 895

892 896

893 897

894 898

895 899

896 900

897 901

898 902

899 903

900 904

901 905

902 906

903 907

904 908

905 909

906 910

907 911

908 912

909 913

910 914

911 915

912 916

913 917

914 918

915 919

916 920

917 921

918 922

919 923

920 924

921 925

922 926

923 927

924 928

925 929

926 930

927 931

928 932

929 933

930 934

931 935

932 936

933 937

934 938

935 939

936 940

937 941

938 942

939 943

940 944

941 945

942 946

943 947

944 948

945 949

946 950

947 951

948 952

949 953

950 954

951 955

952 956

953 957

954 958

955 959

956 960

957 961

958 962

959 963

960 964

961 965

962 966

963 967

964 968

965 969

966 970

967 971

968 972

969 973

970 974

971 975

972 976

973 977

974 978

975 979

976 980

977 981

978 982

979 983

980 984

981 985

982 986

983 987

984 988

985 989

986 990

987 991

988 992

989 993

990 994

991 995

992 996

993 997

994 998

995 999

996 1000

997 1001

998 1002

999 1003

1000 1004

1001 1005

1002 1006

1003 1007

1004 1008

1005 1009

1006 1010

1007 1011

1008 1012

1009 1013

1010 1014

1011 1015

1012 1016

1013 1017

1014 1018

1015 1019



Filter repositories



first-repo



numerical_coordinates ▾

Changes ●

History



Update from master

View branch

Publish

Merge 1 commit from master into numerical_coordinates

numerical_coordinates



Switch to numerical_coordinates
35 minutes ago by Séverin Lemaignan

Switch to numerical_coordinates



Séverin Lemaignan 8f6ef0f

Revert Collapse all

main.cpp

```
...  ... @@ -16,7 +16,7 @@ int main(int argc, char** argv) {  
16 16     while(!done) {  
17 17  
18 18         char i = 0;  
19 -     cout << " A B C " << endl;  
19 +     cout << " 1 2 3 " << endl;  
20     cout << " -----" << endl;  
21     cout << "1";  
22 22 }
```

We switch back to numerical_co-
ordinates and merge in master



numerical_coordinates ▾

Changes

History



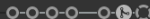
Filter repositories

first-repo

Compare ▾

Publish

numerical_coordinates



Merge branch 'refs/heads/master' into 'refs/heads/master' just now by Séverin Lemaignan



Switch to numerical_coordinates 36 minutes ago by Séverin Lemaignan



Improved grid rendering with coordinates 5 hours ago by Séverin Lemaignan



Testing the rendering of a grid 5 hours ago by Séverin Lemaignan



Added a basic main() 5 hours ago by Séverin Lemaignan



Initial commit -- just a README 5 hours ago by Séverin Lemaignan

Merge branch 'refs/heads/master' into 'refs/heads/master'



Merge branch 'refs/heads/master' into 'refs/heads/master' just now by Séverin Lemaignan



Séverin Lemaignan 64344d4

Revert Collapse all

main.cpp



```
...  ...  @@ -13,6 +13,10 @@ int main(int argc, char** argv) {
13  13      0,1,0,
14  14      0,0,1};
15  15
16  +   char x_char;
17  +   int x;
18  +   int y;
19  +
16  20   while(!done) {
17  21
18  22       char i = 0;
...  ...  @@ -30,7 +34,21 @@ int main(int argc, char** argv) {
30  34       cout << i/3 + 1;
31  35   }
32  36   }
33  +   done = true;
34  +
35  +   cout << endl << "Enter X coordinate (A, B or C):";
36  +   cin >> x_char;
37  +   x = (x_char == 'A' ? 0 : (x_char == 'B' ? 1 : 2));
40  +
```

The merge commit is reflected
in the history of the branch

ETIQUETTE OF SOCIAL CODING 101

principle of least surprise

Make people feel at home when they interact with your project!

one repo = one thing

make plenty of repos!

REPOSITORY LAYOUT

Try to follow as much as possible the **Filesystem Hierarchy Standard** (FHS). Mainly:

src/	# <i>source</i>
include/	# <i>*public* headers</i>
etc/	# <i>configuration files</i>
share/	# <i>data</i>
doc/	# <i>documentation</i>
README	
LICENSE	

NO build artifacts!!
no binaries (except possibly in share/)

REPOSITORY LAYOUT

Try to follow as much as possible the **Filesystem Hierarchy Standard** (FHS). Mainly:

src/	<i># source</i>
include/	<i># *public* headers</i>
etc/	<i># configuration files</i>
share/	<i># data</i>
doc/	<i># documentation</i>
README	
LICENSE	

README (or better, use markdown: README.md): what is the project about? who is the target audience? how to install? how to get started?

LICENSE

- **no license** ⇒ default copyright laws apply. You (or probably UoP) retain all rights to your source code; nobody else may reproduce, distribute, or create derivative works from your work.
- **Permissive licenses**: others do essentially whatever they want with your code, as long as they give your attribution. Examples: MIT, BSD
- **Copyleft licenses**: Derivative work must be made available under the same terms as the original work (*viral licenses*). Example: GPL

You always keep the author rights!

⇒ you can change the license at any time.

LICENSE

- **no license** \Rightarrow default copyright laws apply. You (or probably UoP) retain all rights to your source code; nobody else may reproduce, distribute, or create derivative works from your work.
- **Permissive licenses:** others do essentially whatever they want with your code, as long as they give your attribution. Examples: MIT, BSD
- **Copyleft licenses:** Derivative work must be made available under the same terms as the original work (*viral licenses*). Example: GPL

Check **<http://choosealicense.com/>**
and discuss that with your supervisor

BUILD SYSTEM

Use and provide a build system!

- Windows-only \Rightarrow a Visual Studio solution is ok
- MacOS-only \Rightarrow a XCode project is ok

In all other cases, go for a cross-platform build system like **CMake**.

COMMIT HYGIENE

“Show me the project history, I’ll tell you what coder you are”

- **Commit often!** Push when needed (or at the end of day)

Because commits are local (ie, private), **do commit often: mistakes are ok** as you can fix them before sharing with others.

COMMIT HYGIENE

“Show me the project history, I’ll tell you what coder you are”

- Write useful messages (no “Fixed bug” or “New file”)
- First line of commit messages < 72 characters

COMMIT HYGIENE

“Show me the project history, I’ll tell you what coder you are”

- Tag important commits!

Notably, GitHub (amongst others) interpret tags as **releases** of your code.

A FEW COOL GITHUB STUFF TO FINISH

Besides bugtracking, project homepages and wikis, GitHub integrates with many third-party services & tools:

- **Travis CI** or **AppVeyor** for continuous integration

[sensors] Added an 'encoders' level to the velocity sensor #541

Edit

 **severin-lemaignan** wants to merge 1 commit into `morse-simulator:master` from `severin-lemaignan:encoders`

💬 Conversation 4

🔑 Commits 1

📄 Files changed 3

+134 -3

**severin-lemaignan** commented on 29 May 2014

The Modular OpenRobots Simulation Engine member

This new abstraction level for the velocity sensor that returns encoder ticks instead of linear/angular speeds

Concerning DifferentialDriveVelocity, I ignored [...]

Labels

None yet

Milestone

No milestone

Notifications

🔔 Unsubscribe

You're receiving notifications because you authored the thread.

2 participants



🔒 Lock conversation

Add more commits by pushing to the **encoders** branch on **severin-lemaignan/morse**.



❌ **All checks have failed**
1 errored check

[Hide all checks](#)

❌ **continuous-integration/travis-ci** — The Travis CI build could not complete du...

[Details](#)

⚠️ **This branch has conflicts that must be resolved**
[Use the command line](#) to resolve conflicts before continuing.

🔗 Merge pull request or view [command line instructions](#).

A FEW COOL STUFF TO FINISH

- + GitHub integrates with many external services & tools:
 - **Travis CI** or **AppVeyor** for continuous integration
 - **zenodo**: associate a DOI to your repository
 - **ReadTheDocs**: generate and publish on-line documentation