



Source control
with git and
Github

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Installation

Practical

Practical

Branches

Fork and Pull
Request

Write
Documents

Source control with git and Github

Eric Marcon

11 October 2024



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git

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git is a source manager:

- Track changes: much more than a backup!
- Ability to go back in time;
- Several competing versions: branches.



GitHub

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GitHub is a collaboration platform based on Git.

- Multiple developers: the end of attached files!
- Presentation of results: GitHub pages;
- Continuous integration: GitHub Actions.



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git

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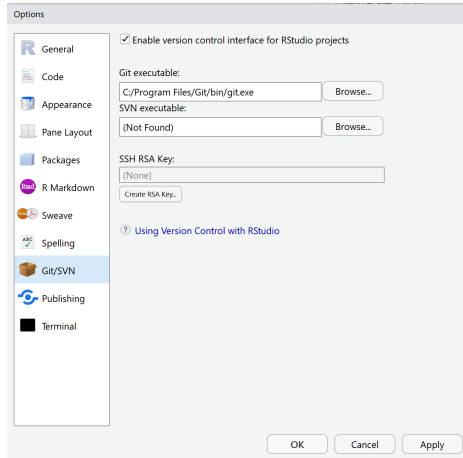
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RStudio must detect Git



Otherwise, install it.



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Open an account on GitHub

The screenshot shows the GitHub profile page for Eric Marcon. The browser address bar displays 'https://github.com/EricMarcon'. The page layout includes a profile picture of a man with grey hair, the name 'Eric Marcon', and the username 'EricMarcon'. Below the name is a bio section with the text 'AgroParisTech', 'Kourou, French Guiana', and an email address 'eric.marcon@ecofog.gf'. There are also links to 'Add a bio' and a website 'http://www.ecofog.gf/isip.php?'. The 'Organizations' section shows a logo for 'AgroParisTech'. The 'Popular repositories' section lists four repositories: 'endropart', 'dismas', 'SpatDiv', and 'ericmarcon.github.io'. The 'Contributions' section shows a grid of green squares representing contributions over time, with the text '429 contributions in the last year' and a link to 'Learn how we count contributions'.



GitHub security

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Create a GitHub token:

- User account settings;
- Developer Settings > Personal Access Tokens;
- Generate a token, describe it as “git-RStudio” and give it “repo” authorization.

Save the token!



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Create a project

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From scratch:

- In GitHub:
 - *New Repository*
 - Choose name (no special characters)
 - Add an appropriate *.gitignore*.
- Copy the URL from *Clone or Download*.
- In RStudio: New project / Version Control / Git, paste the URL.



Create a project

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From an existing RStudio project:

- Put the project under version control:
 - *Tools /Version Control /Project Setup...*
 - Select *Git*.
- Create a repository on GitHub and retrieve its URL:
<https://github.com/MyAccount/MyRepo.git>
- In RStudio Terminal, run :

```
git remote add origin https://github.com/MyAccount/MyRepo.git
git branch -M master
git push -u origin master
```



Basic operations: filter

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Modified files are displayed in the RStudio Git window.

Use `.gitignore` to hide non-tracked files.



Basic operations: commit

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- Create an R file with one line of code and save it.

After each work session, *Commit* the result.

Select files to commit.

Enter a clear message: summary on the first line.



Basic operations: synchronize

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Push modifications to GitHub to make them public.

Pull to retrieve changes from GitHub.



Basic operations: collaborate

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Declare a collaborator.

Work with two or more people on the same file.

Content of a work session:

- Pull,
- Modify,
- Commit,
- Push.



Conflicts

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The elementary data is the line.

Conflicting changes imply a conflict.

Minimize conflicts: in a text, one sentence = one line.

In case of conflict, decide which code or text to keep.



Project tracking

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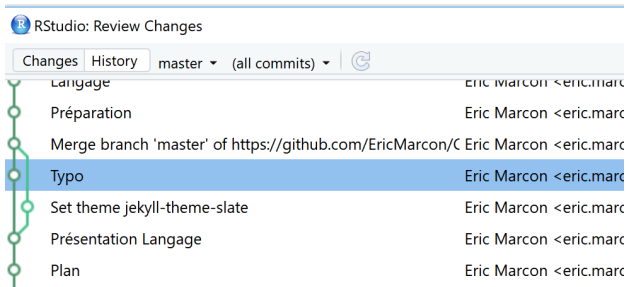
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Clock icon in Git window





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Generate a conflict

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Edit the same line of README.md :

- online on GitHub,
- locally.

Commit, Pull, observe the conflict, solve it.



Collaborate with your neighbor

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The neighbor on the left invites the neighbor on the right to GitHub.

Both modify the project.

- Remember to pull before modifying.
- Push quickly to limit conflicts.



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Purpose

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Modify the project without disturbing its stable state.

Application :

- develop new functionality,
- test it, correct bugs,
- make it visible when finished.



Create a branch

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Click on New Branch

Work in the new branch (pull, commit, push).



Merge

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Move to master branch.

Run:

```
git merge branch_to_merge
```




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Fork and Pull Request



Fork

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Goal: modify someone else's repository

Fork: create a copy of the repository

Start a new branch, modify it.



Pull Request

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Branch integration request: *Pull Request*.

On GitHub.

Dialogue possible.

If accepted, merge branch and delete.



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Write Documents



Use memoirR

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Write
Documents

Install the **memoiR** package.

Create a new document with memoirR: Stylish Document.

Knit it to check everything is OK.



Source Control

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Documents

Use git with your document.

Create an appropriate gitignore:

```
memoiR::build_gitignore()
```

Store the knitted files into /docs

```
memoiR::build_githubpages()
```

Make your first commit.



Upload to GitHub

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Create your repo on GitHub.

Copy the commands to upload an existing git repo:

```
git remote add origin https://github.com/MyAccount/MyRepo.git
git branch -M master
git push -u origin master
```



Declare repo in header

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Documents

In the header of your Rmd file, update the repository name and the URL.

Commit.

Add a README:

```
memoiR::build_readme()
```

Commit.



Continuous integration

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On GitHub, your repo, Settings / Secrets and variables /
Action :

- Add two secrets:
 - EMAIL: your email address
 - GH_PAT: your personal access token

In RStudio, run

```
memoiR::build_ghworkflow()
```

Commit, Push and look at Actions.