



Tools for biologists

Antonio Profico ([antonio.profico@unipi.it](mailto:antonio.profico@unipi.it))

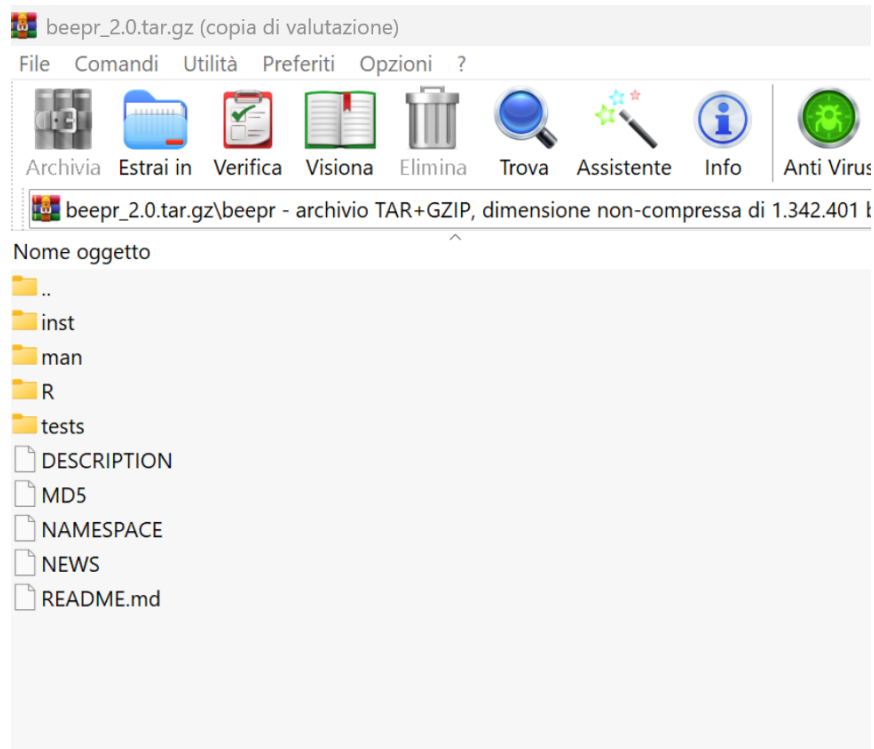
Luca Rindi ([luca.rindi@unipi.it](mailto:luca.rindi@unipi.it))

# What is an R package?

Collection of R functions, data and documentation

Organized into a structured folder system

Can include functions, datasets, vignettes, help files



There are different servers to store an R package:

CRAN (official R packages)

**GitHub**

Bioconductor

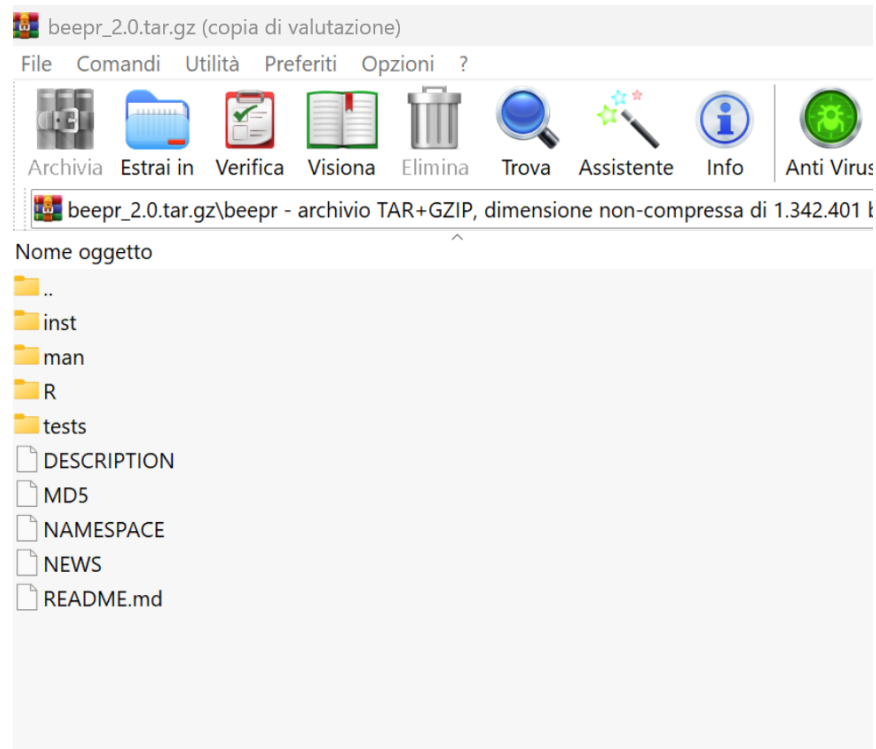
etc.

# What is an R package?

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Readme file

Description file

Functions are listed in the folder R

Help page in the folder man

# Let's start from the R functions

#' NAME FUNCTION



Must coincide with the name of the function

#'

#' DESCRIPTION FUNCTION

#' @param ARGUMENT1:



Replace ARGUMENT1 with the real name of the argument

#' @param ARGUMENT2:

#' @return OUTPUT



Replace OUTPUT with the real name of the value

#' @author

#' @examples EXAMPLE CODE

#' @export



Important to close the help page

```
eucl_dist<-function(P1,P2) {
```

```
X1<-P1[1]
```

```
Y1<-P1[2]
```

```
X2<-P2[1]
```

```
Y2<-P2[2]
```

```
step1<-(X1-X2)^2
```

```
step2<-(Y1-Y2)^2
```

```
d<-sqrt(step1+step2)
```

```
return(d) }
```

# The Description file

Package: Name of the package

Type: Package

Title: Title

Version: 0.9

Authors@R: c(person(given="Antonio", family="Profico",email = "antonio.profico@gmail.com", role=c("aut", "cre")))

Description: Add description

Depends: **R (>= 3.4.0)**

Imports: lattice (>= 0.2), mgcv (>= 1.8), Rvcg (>= 0.18), Morpho (>= 2.0), Arothron (>= 1.2), oce (>= 1.1), rgdal (>= 1.4), raster(>= 3.0), sp (>= 1.3), geometry (>= 0.4.0), rgl (>= 0.1), colorRamps (>= 2.3), DescTools (>= 0.99), grDevices (>= 3.5), graphics (>= 3.5), morphomap (>= 1.3)

License: GPL-2

Author: Antonio Profico [aut, cre],

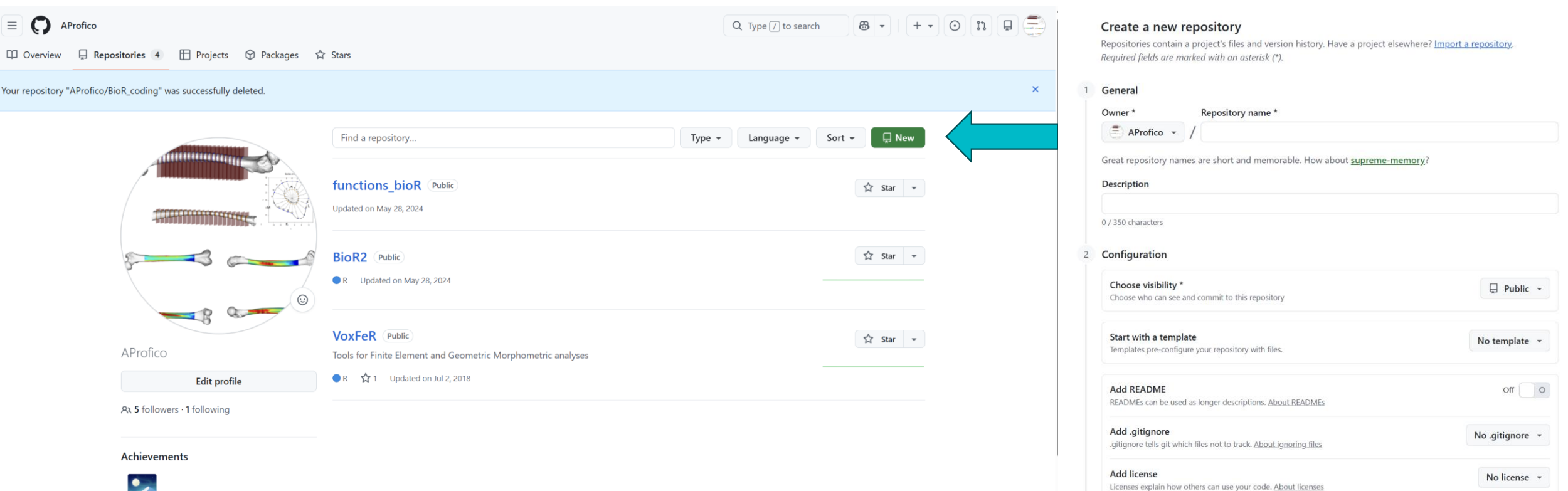
Maintainer: Antonio Profico <antonio.profico@gmail.com>



**Don't write in your code library(xxx),  
install.packages('xxx'), require(xxx)**

**Save the file Description (without extension) in the main folder**

# Let's create our R package on GitHub



The screenshot displays the GitHub web interface. On the left, the user's profile for 'AProfico' is visible, showing a circular avatar with anatomical diagrams, a bioRx preprint, and a list of repositories: 'functions\_bioR' (Public, updated May 28, 2024), 'BioR2' (Public, updated May 28, 2024), and 'VoxFeR' (Public, updated Jul 2, 2018). A blue arrow points to the 'New' button in the repository list. On the right, the 'Create a new repository' form is shown, with sections for General and Configuration. The 'General' section includes fields for Owner (AProfico), Repository name, and Description. The 'Configuration' section includes options for visibility (Public), start with a template (No template), add a README (Off), add a .gitignore (No .gitignore), and add a license (No license).

**Create a new repository**

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#). Required fields are marked with an asterisk (\*).

1 **General**

Owner \* AProfico / Repository name \*

Great repository names are short and memorable. How about [supreme-memory](#)?

Description

0 / 350 characters

2 **Configuration**

**Choose visibility \*** Public

Choose who can see and commit to this repository

**Start with a template** No template

Templates pre-configure your repository with files.

**Add README** Off

READMEs can be used as longer descriptions. [About READMEs](#)

**Add .gitignore** No .gitignore

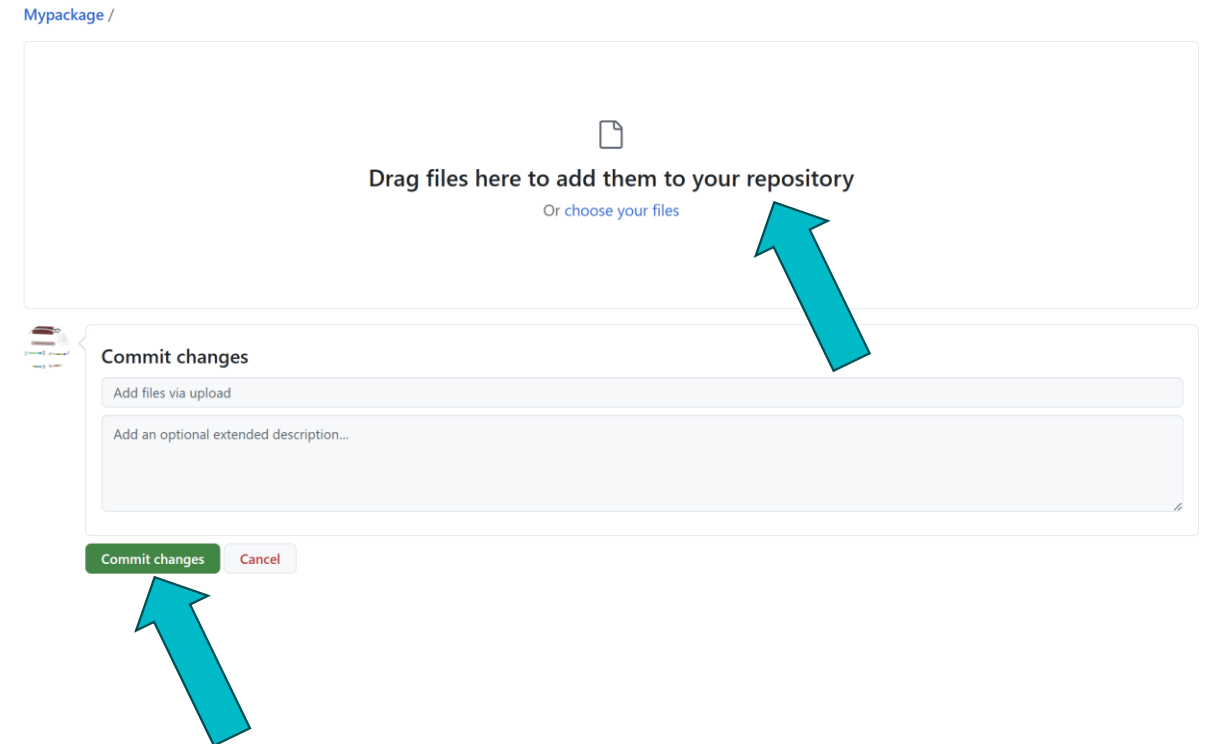
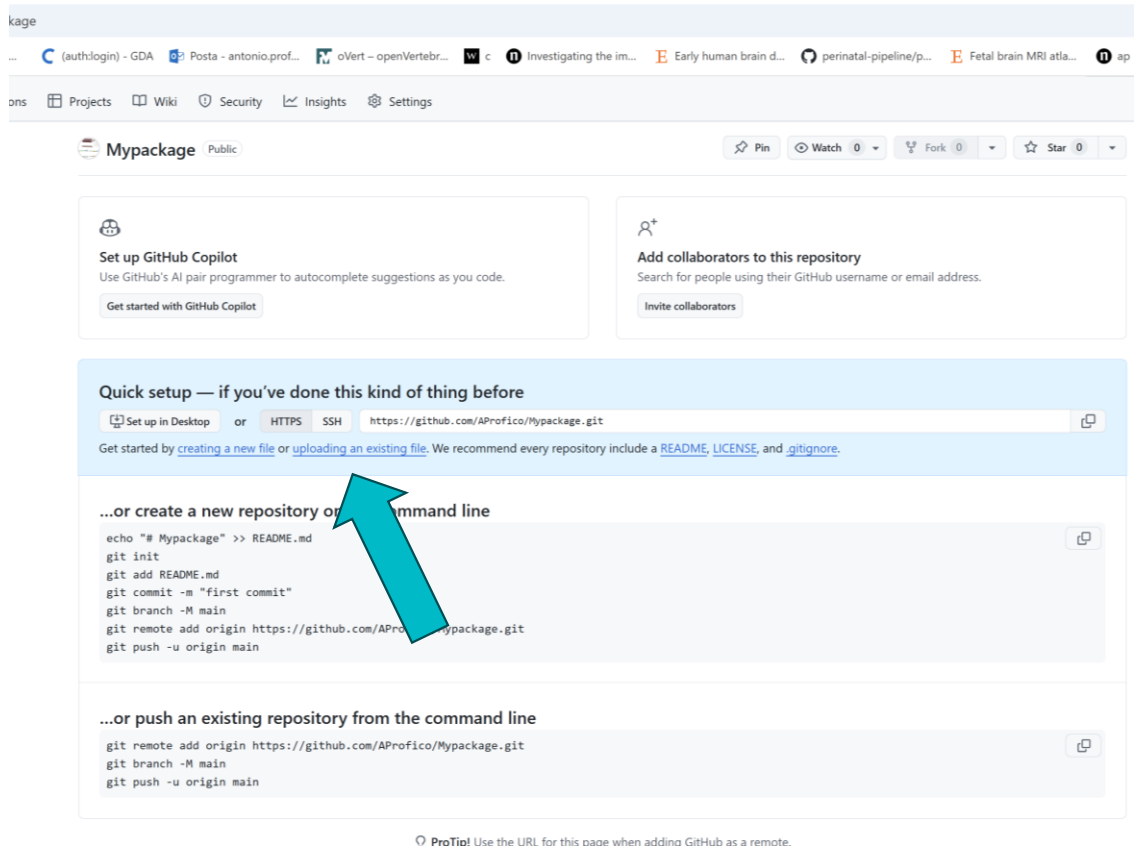
.gitignore tells git which files not to track. [About ignoring files](#)

**Add license** No license

Licenses explain how others can use your code. [About licenses](#)

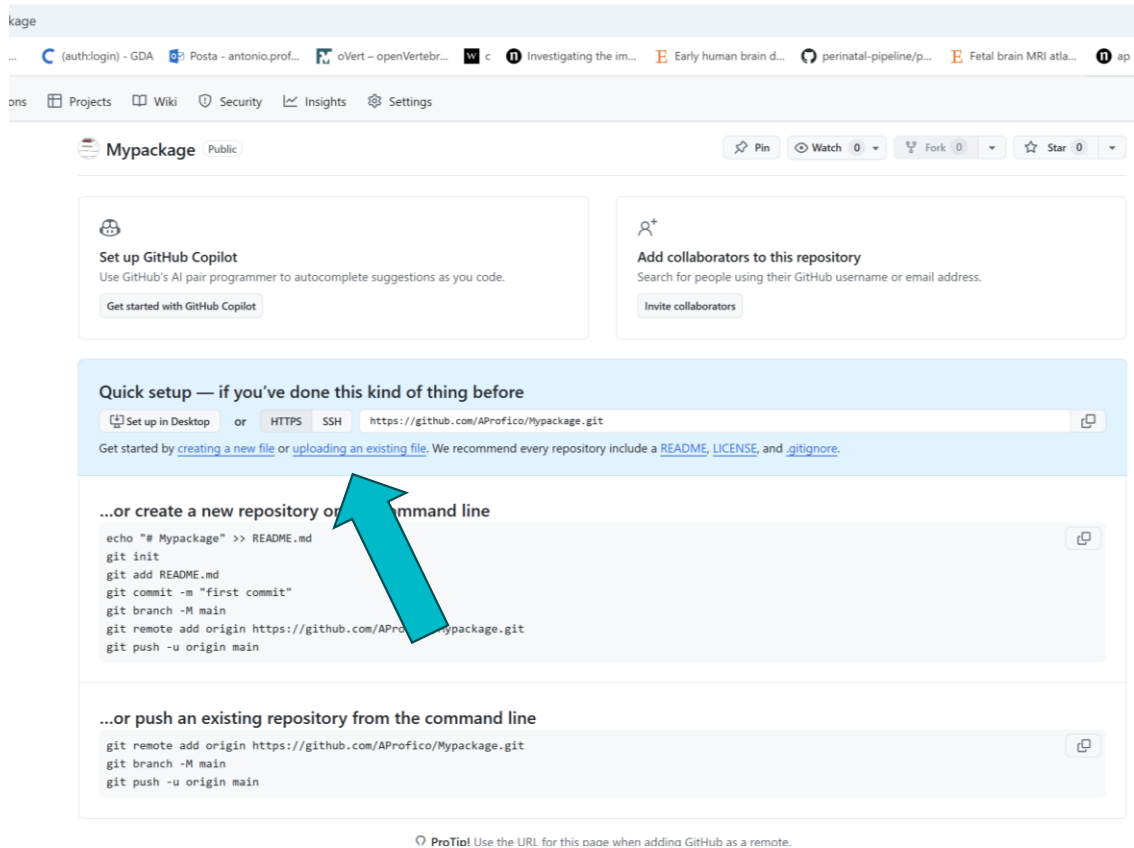
Add Repository Name and Description and click on Create Repository

# Let's create our R package on GitHub



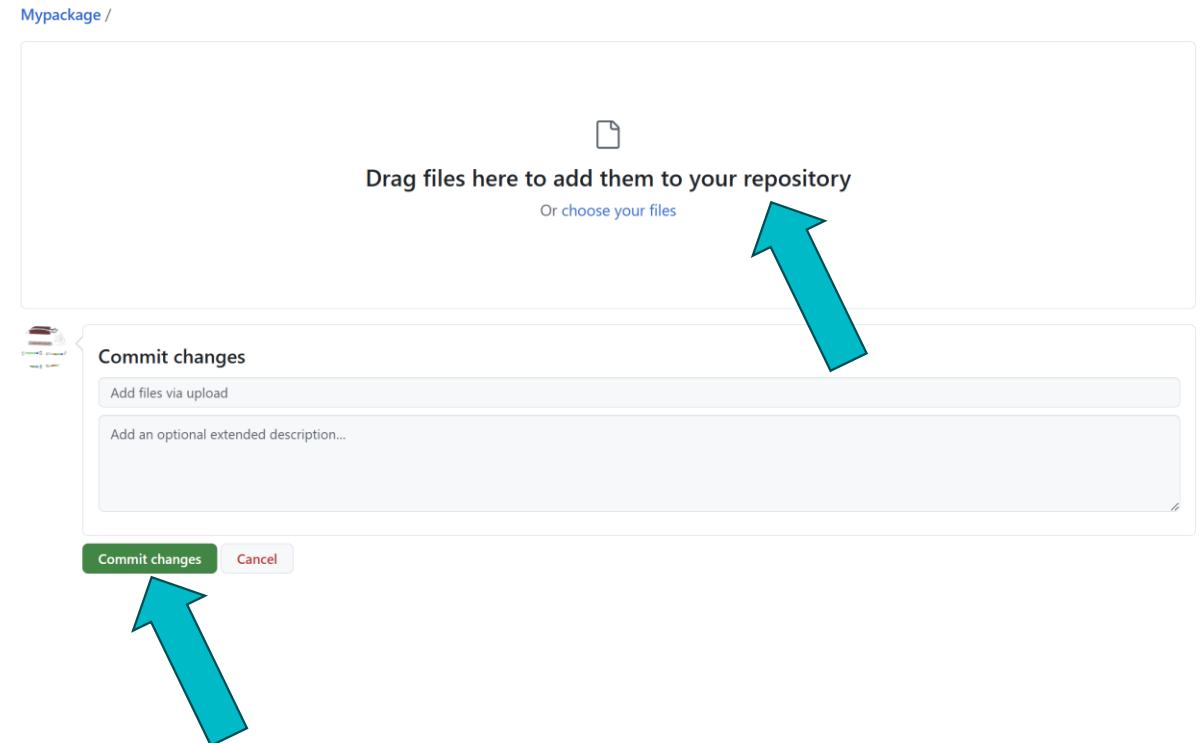
Click on uploading and existing file

# Install your package from R



Click on uploading and existing file

We can install the R package but the help page is not available, let's fix that



```
install.packages("devtools")
library(devtools)
install_github("https://github.com/AProfico/Mypackage")
library(Mypackage)
eucl_dist(c(0,1),c(1,1))
```



# Update your package

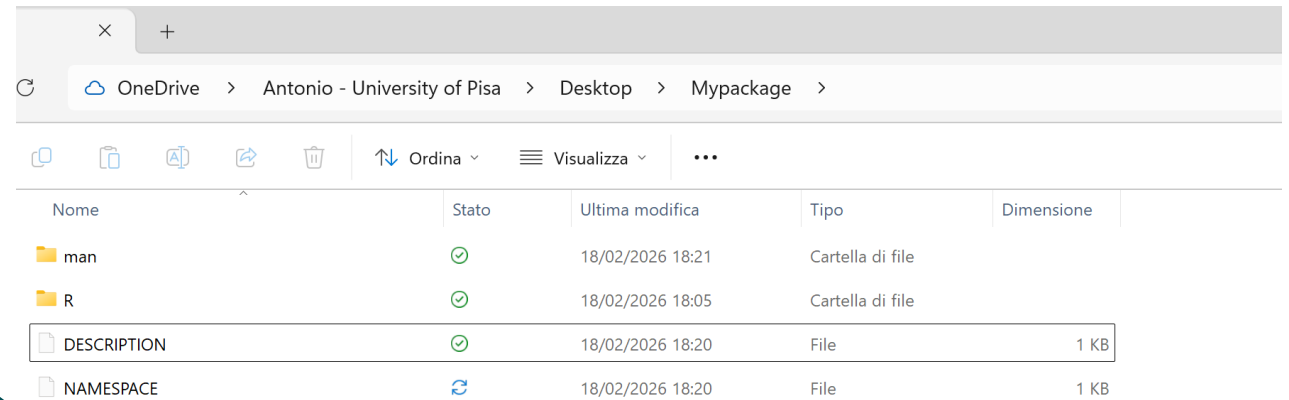
```
install.packages("devtools")  
library(devtools)  
install_github("https://github.com/AProfico/Mypackage")  
library(Mypackage)  
eucl_dist(c(0,1),c(1,1))
```

```
remove.packages("Mypackage")
```

## Restart R

```
setwd("C:/Users/anton/OneDrive - University of  
Pisa/Desktop/Mypackage")  
library(devtools)  
document()
```

Upload the entire main folder on GitHub



Nome	Stato	Ultima modifica	Tipo	Dimensione
man	✓	18/02/2026 18:21	Cartella di file	
R	✓	18/02/2026 18:05	Cartella di file	
DESCRIPTION	✓	18/02/2026 18:20	File	1 KB
NAMESPACE	↻	18/02/2026 18:20	File	1 KB

# Install your package from R

```
library(devtools)
install_github("https://github.com/AProfico/Mypackage")
library(Mypackage)
?eucl_dist
eucl_dist(c(0,1),c(1,1))
```

The screenshot displays the RStudio interface during the installation and documentation of a package named 'Mypackage'.

**Script Editor:** The script contains the following R code:

```
1 install.packages("devtools")
2 library(devtools)
3 install_github("https://github.com/AProfico/Mypackage")
4 library(Mypackage)
5 ?eucl_dist
6 eucl_dist(c(0,1),c(1,1))
7
8 remove.packages("Mypackage")
9
10
11
12
```

**Console:** The console shows the output of the commands, including the installation of 'devtools', the installation of 'Mypackage' from GitHub, and the successful loading of the package. The final output is:

```
* DONE (Mypackage)
> library(Mypackage)
> ?eucl_dist
>
```

**Environment:** The environment pane shows the 'Global Environment' with 277 MiB of memory used.

**Files:** The files pane shows the project structure, including the 'Mypackage' directory.

**Documentation:** The documentation pane displays the help page for the 'eucl\_dist' function. The title is 'Euclidean Distance Between Two Points'. The description states: 'Euclidean Distance Between Two Points'. The usage is shown as 'eucl\_dist(P1, P2)'. The arguments are listed as 'P1' (Numeric vector of length 2 representing the coordinates (x, y) of the first point) and 'P2' (Numeric vector of length 2 representing the coordinates (x, y) of the second point). The value is described as 'A numeric value representing the Euclidean distance between P1 and P2'. The author is listed as 'Your name'. Examples are provided, including 'eucl\_dist(c(0, 0), c(3, 4))'. The package version is 0.9, and an index link is provided.

And voilà!

# Include a dataset

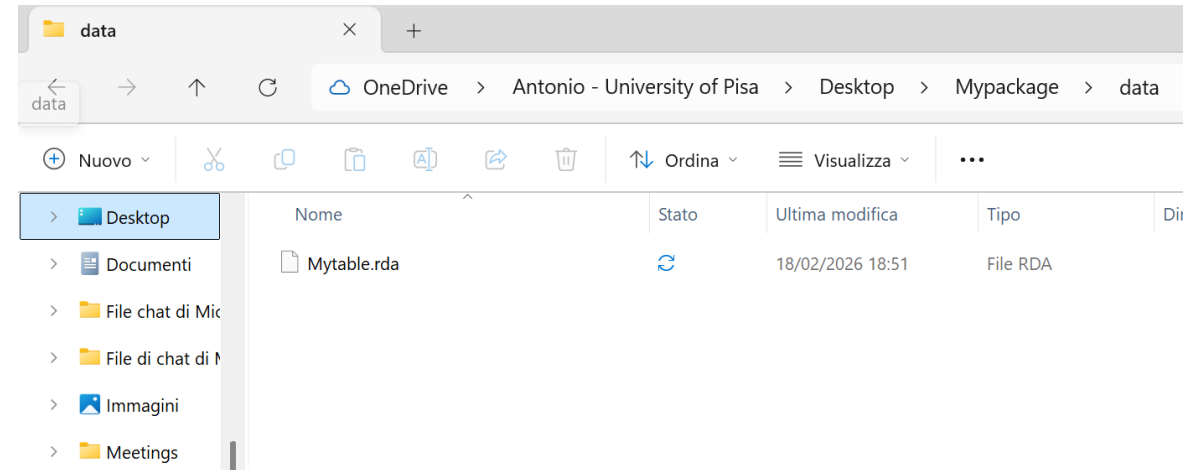
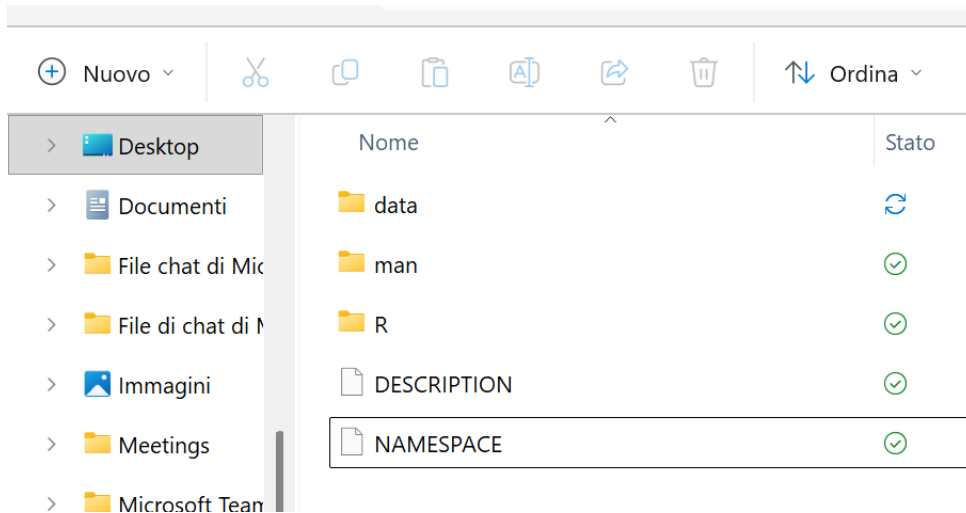
You can store also data in R

Create a matrix with 25 rows and 2 columns and assign it to an object called Mytable

Mytable

```
save(Mytable,file = "Mytable.rda")
```

Create a sub folder called data and move the file *Mytable.rda* within it



# Compile and update your package from R

```
setwd("C:/Users/anton/OneDrive - University of Pisa/Desktop/Mypackage")  
remove.packages("Mypackage")  
library(devtools)  
document()
```

## Update again the R package on GitHub

```
library(devtools)  
install_github("https://github.com/AProfico/Mypackage")  
library(Mypackage)  
data("Mytable")  
eucl_dist(Mytable[1,],Mytable[2,])
```

**Add the function scholar2cloud in your R package**