

# CPCZurich2023 Practical Tutorial

## Reinforcement Learning using hBayesDM

### Installation Guide

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This tutorial will make use of the R version of the hBayesDM package. There are two parts in this installation guide, one dedicated to the installation on **Windows** (part A) and the other to the installation on **macOS** (part B).

### PART A) How to install R version hBayesDM on Windows:

1. Install **R** (From version 4.0.0 to 4.1.3)

\* For a safe installation, please make sure your R version matches with Rtools40.  
<https://cran.r-project.org/bin/windows/base/old/>

2. Install **Rstudio**

<https://www.rstudio.com/products/rstudio/download/#download>

3. Install **Rtools** (rtools40)

\* Currently, dependencies for hBayesDM packages are not fully up-to-date with Rtools42. Please make sure your machine is running on rtools40.

i. Download and run the installer: <https://cran.r-project.org/bin/windows/Rtools/rtools40.html>

ii. Open R studio. In R studio Console, run this code

```
writeLines('PATH="%{RTOOLS40_HOME}\\usr\\bin;%{PATH}"', con = "~/.Renviro")
```

iii. Restart R

Use the menu item Session > Restart R or the associated keyboard shortcut Ctrl + Shift + F10.

iv. Verify that “make” can be found, which should show the path to your Rtools installation. ★ If the path cannot be found, reboot your PC.

```
Sys.which('make')  
## should result in "C:\\rtools40\\usr\\bin\\make.exe"
```

v. If this works, you can try to install an R package from source:

```
install.packages('jsonlite', type = 'source')
```

- vi. Verify that your machine finds the right path to the library.

```
.libPath()  
## Should result in your path the libraries  
## e.g. C:\Users\CCS-Lab\Documents\R\win-library\4.1
```

#### 4. Install the latest version of **rstan**

Install the latest version of rstan by typing the following command in R studio

Console:

```
install.packages('rstan')
```

#### 5. Install **hBayesDM**

Install the latest version of hBayesDM through GitHub:

```
# install devtools if not installed yet  
if (!require(devtools)) install.packages("devtools")  
# install hBayesDM  
install.packages("hBayesDM")
```

6. Verify that the following test code runs without any error:

```
library(hBayesDM)  
# Test if the package works fine using example data  
output1 = gng_m1(data="example", niter=2000, nwarmup=1000, nchain=2, ncore=2)  
# plot the output  
plot(output1)
```

For more information, please check this tutorial:

[https://ccs-lab.github.io/hBayesDM/articles/getting\\_started.html](https://ccs-lab.github.io/hBayesDM/articles/getting_started.html)

### **PART B) How to install R version hBayesDM on macOS:**

1. Install **R** (>= version 4.2.0)

<https://cran.r-project.org/bin/macosx/>

2. Install **Rstudio**

<https://www.rstudio.com/products/rstudio/download/#download>

3. Remove ~/.R

If there is a folder named `.R` in your home directory (`~/R`), remove it. You could remove it manually by searching the files or by typing the following command in Terminal. See this link to open or quit Terminal on Mac (<https://support.apple.com/guide/terminal/apd5265185d-f365-44cb-8b09-71a064a42125/mac>).

```
rm -R ~/.R
```

#### 4. Install the latest version of **rstan**

Install the latest version of `rstan` by typing the following command in R command line:

```
install.packages("rstan", repos = "https://cloud.r-project.org/", dependencies = TRUE)
```

During the installation of `rstan`, you may get an error message that you have not agreed to the Xcode license agreements. Then, please run `'sudo xcodebuild -license'` in Terminal to review and agree to the Xcode license agreements.

#### 5. Install **hBayesDM**

Install the latest version of `hBayesDM` through GitHub:

```
# install devtools if not installed yet
if (!require(devtools)) install.packages("devtools")
# install hBayesDM through GitHub
devtools::install_github("CCS-Lab/hBayesDM", ref="develop", subdir="R")
```

#### 6. Restart R session

Use the menu item `Session > Restart R` or the associated keyboard shortcut `Command + Shift + F10`.

#### 7. Verify that the following test code runs without any error:

```
library(hBayesDM)
# Test if the package works fine using example data
output1 = gng_m1(data="example", niter=2000, nwarmup=1000, nchain=2, ncore=2)
# Plot the output
plot(output1)
```

For more information, please check this tutorial:

[https://ccs-lab.github.io/hBayesDM/articles/getting\\_started.html](https://ccs-lab.github.io/hBayesDM/articles/getting_started.html)