CPCZurich2025 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 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 <u>Windows</u>:

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 = "~/.Renviron")
```

    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 libaries
## 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

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