空间广义线性模型

代码实现

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摘要

hello

1 引言

1.1 模型

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} \mathrm{e}^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

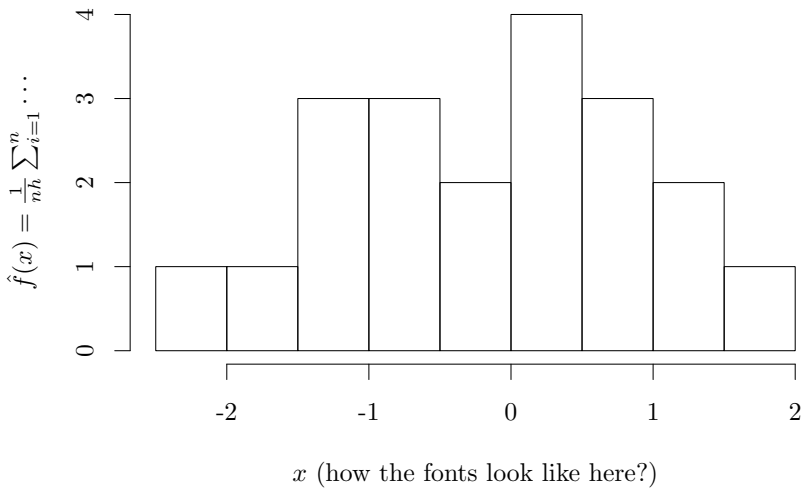
This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
(x=rnorm(20))
```

```
##  [1] -1.35292893  1.49823408 -0.14743260  1.33317141  1.52774691
##  [6]  0.16960174  0.48961688  0.45538169  0.87670968 -1.71038882
## [11] -1.01716992 -0.58479264 -0.03733654 -2.38132273 -0.93022722
## [16] -1.25915993  0.16190615 -0.62120711  0.67988239  0.86243098
```

```
par(mar = c(4.5, 4, .1, .1))
hist(x, main=”, xlab='$x$ (how the fonts look like here?)',
  ylab='$\\hat{f}(x) = \\frac{1}{nh}\\sum_{i=1}^n \\cdots$')
```

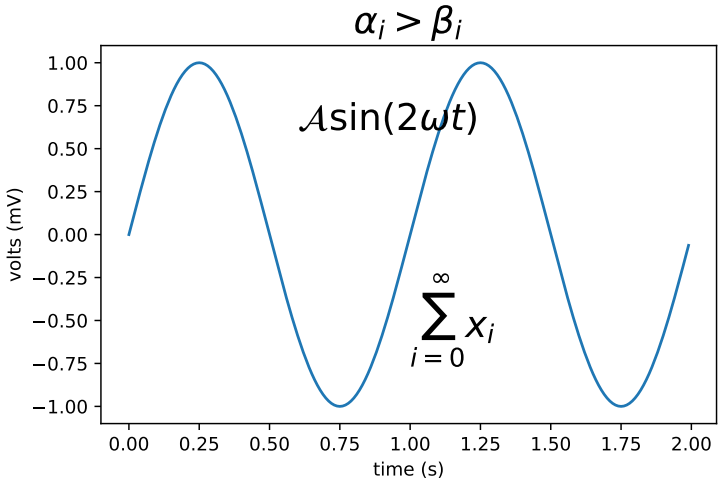


先安装 python-pip

```
sudo apt-get install -y python-pip
pip install numpy matplotlib
```

@ref(fig:math-matplotlib)

```
import numpy as np
import matplotlib.pyplot as plt
plt.switch_backend('agg')
t = np.arange(0.0, 2.0, 0.01)
s = np.sin(2*np.pi*t)
plt.plot(t,s)
plt.title(r'$\alpha_i > \beta_i$', fontsize=20)
plt.text(1, -0.6, r'$\sum_{i=0}^\infty x_i$', fontsize=20)
plt.text(0.6, 0.6, r'$\mathcal{A}\mathrm{sin}(2 \omega t)$',
         fontsize=20)
plt.xlabel('time (s)')
plt.ylabel('volts (mV)')
plt.show()
```




```
library(reticulate)
os <- import("os")
os$listdir(".")
```

```
## [1] "sglmm.Rmd"              "sglmm.pdf"              "fig.svg"
## [4] "sglmm-tikzDictionary" "fig.pdf"                "sglmm_files"
## [7] "refer.bib"
```

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.[1]

```
Sys.which("gcc")
```

```
##             gcc
## "/usr/bin/gcc"
```

```
system("gcc --version")
```

```
## gcc (Debian 6.3.0-18+deb9u1) 6.3.0 20170516
## Copyright (C) 2016 Free Software Foundation, Inc.
## This is free software; see the source for copying conditions.  There is NO
## warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

```
system("g++ --version")
```

```
## g++ (Debian 6.3.0-18+deb9u1) 6.3.0 20170516
## Copyright (C) 2016 Free Software Foundation, Inc.
## This is free software; see the source for copying conditions.  There is NO
## warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

```r
system2("g++", args = "-v", stderr = TRUE)
```

```
## Using built-in specs.
## COLLECT_GCC=g++
## COLLECT_LTO_WRAPPER=/usr/lib/gcc/x86_64-linux-gnu/6/lto-wrapper
## Target: x86_64-linux-gnu
## Configured with: ../src/configure -v --with-pkgversion='Debian 6.3.0-18+deb9u1' --with-bugurl=file:///usr/share/doc/gcc-6/README.Bugs --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --prefix=/usr --program-suffix=-6 --program-prefix=x86_64-linux-gnu- --enable-shared --enable-linker-build-id --libexecdir=/usr/lib --without-included-gettext --enable-threads=posix --libdir=/usr/lib --enable-nls --with-sysroot=/ --enable-clocale=gnu --enable-libstdcxx-debug --enable-libstdcxx-time=yes --with-default-libstdcxx-abi=new --enable-gnu-unique-object --disable-vtable-verify --enable-libmpx --enable-plugin --enable-default-pie --with-system-zlib --disable-browser-plugin --enable-java-awt=gtk --enable-gtk-cairo --with-java-home=/usr/lib/jvm/java-1.5.0-gcj-6-amd64/jre --enable-java-home --with-jvm-root-dir=/usr/lib/jvm/java-1.5.0-gcj-6-amd64 --with-jvm-jar-dir=/usr/lib/jvm-exports/java-1.5.0-gcj-6-amd64 --with-arch-directory=amd64 --with-ecj-jar=/usr/share/java/eclipse-ecj.jar --with-target-system-zlib --enable-objc-gc=auto --enable-multiarch --with-arch-32=i686 --with-abi=m64 --with-multilib-list=m32,m64,mx32 --enable-multilib --with-tune=generic --enable-checking=release --build=x86_64-linux-gnu --host=x86_64-linux-gnu --target=x86_64-linux-gnu
## Thread model: posix
## gcc version 6.3.0 20170516 (Debian 6.3.0-18+deb9u1)
```

```r
system2("python", args = "--version", stderr = TRUE)
```

```
## Python 2.7.13
```

插入图片

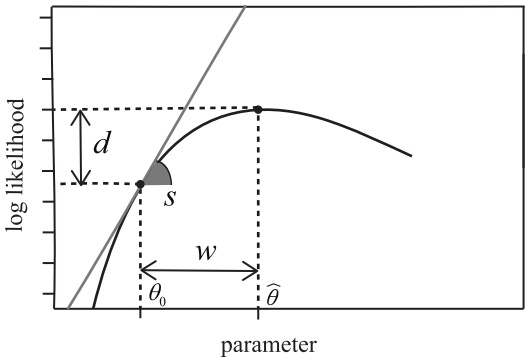


图 1: 未优化

```
knitr::include_graphics(path = "fig.pdf")
```

参考文献

[1] H. Rue, A. I. Riebler, S. H. Sørbye, J. B. Illian, D. P. Simpson, and F. K. Lindgren. Bayesian computing with INLA: A review. Annual Reviews of Statistics and Its Applications, 4(1):395–421, 2017.