API

2018 3 <88>15

WEB API

```
library('httr')
library('jsonlite')
library('tidyverse')
library('rlist')
library('Rgctc2',lib.loc='~/GitHub/R_coordination_transformation')
library('sf')
```

```
options(digits=11)
get_location<- function(address){
  key = '7c6b6c0d1b641f4aa9cdb7d2229ae728'                              #      API key
  url = 'http://restapi.amap.com/v3/config/district?' %>%
        paste('keywords=' , address ,
              '&key=' ,key ,
              '&subdistrict=1' ,                                        #
              '&extensions=all',
               sep = '')
  geoinfo<-GET(url)%>% content(as="text",encoding="UTF-8") %>%
        fromJSON(flatten = TRUE)                                        #
  return(geoinfo)
}
```

address adcode adcode adcode

```
  zj<-get_location('  ') %>% '[['('districts')
```

districts *districts*

```
## 'data.frame':    1 obs. of  7 variables:
##  $ citycode :List of 1
##   ..$ : list()
##  $ adcode   : chr "330000"
##  $ name     : chr "  "
## $ polyline : chr "121.134149,27.786010;121.134130,27.785898;121.134110,27.785840;121.134079,27.785817
##  $ center   : chr "120.152585,30.266597"
##  $ level    : chr "province"
##  $ districts:List of 1
##   ..$ :'data.frame': 11 obs. of  6 variables:
##   .. ..$ citycode : chr  "0572" "0571" "0573" "0579" ...
##   .. ..$ adcode   : chr  "330500" "330100" "330400" "330700" ...
##   .. ..$ name     : chr  "  " "  " "  " "  " ...
##  .. ..$ center  : chr  "120.086809,30.89441" "120.209789,30.24692" "120.75547,30.746191" "119.647229,29
```

```
##   .. ..$ level    : chr  "city" "city" "city" "city" ...
##   .. ..$ districts:List of 11
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
##   .. .. ..$ : list()
```

subdistrict=1 subdistrict=3 *polyline* —— —

```
## chr "121.134149,27.786010;121.134130,27.785898;121.134110,27.785840;121.134079,27.785817;121.134009,1
```

polyline chr) “ ” “ ” “|” “|”

```
zj$polyline<-zj$polyline %>%
             str_split('\\|') %>%
             lapply(str_split,';') %>%
             '[['(1)%>% lapply(str_split,',') %>%     #
             lapply(lapply,as.numeric) %>%
             lapply(list.rbind)%>%                    #

             lapply(gcj02_wgs84_matrix_matrix) %>%    #

             lapply(list) %>%
             st_multipolygon %>% st_sfc(crs=4326)     #polyline  sfc
zj_sf<-st_sf(zj)                                      #  zj   sf
```

- **rlist** R list list list list **base** `lapply` **r** **t** **rlist** `list.rbind` debug
- **Rgctc2** wgs84 R WGS84
- **sf** **sp** **sp** **sf** R GIS ggplot2 `geom_sf` **sf** zj *polyline* **sf** *sfc* zj **sf** `st_sfc(crs=4326)` *polyline* *polyline*

```
## $class
## [1] "sfc_MULTIPOLYGON" "sfc"
##
## $precision
## [1] 0
##
## $bbox
##          xmin          ymin          xmax          ymax
## 118.023019231  27.044744711 122.945311212  31.180867236
##
## $crs
## Coordinate Reference System:
##   EPSG: 4326
```

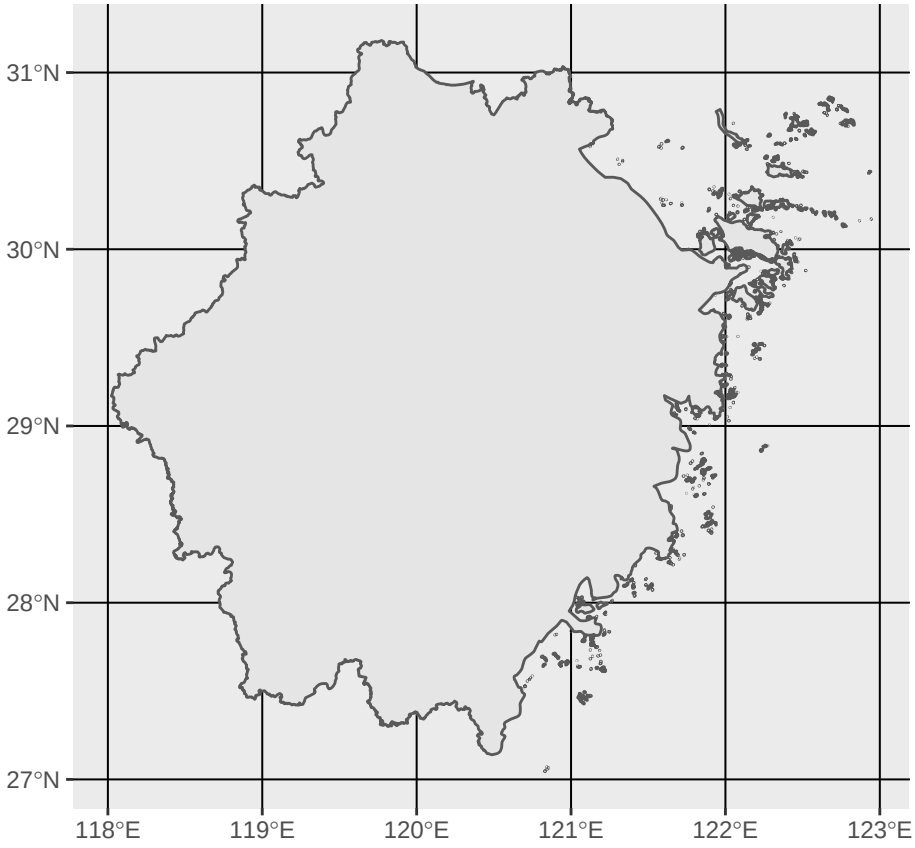

Figure 1:

```
##   proj4string: "+proj=longlat +datum=WGS84 +no_defs"
##
## $n_empty
## [1] 0
```

sfc *multipolygon* *list(list(matrix),list(matirx),……)* , *matrix*

ggplot2

```
library(ggplot2)
ggplot()+geom_sf(data=zj_sf)
```

rbind low R apply

```
zj_city<-zj %>% "["('districts') %>% '[['(1) %>% '[['(1)  #   adcode
zj_city<-lapply(zj_city$adcode,get_location)  %>%         # lapply
         list.map(districts) %>%
         lapply(select,-districts) %>%
         list.rbind
zj_city$polyline <- zj_city$polyline %>%
                    str_split('\\|') %>%
                    lapply(str_split,';') %>%
                    lapply(lapply,str_split,',') %>%
                    lapply(lapply,lapply,as.numeric) %>%
                    lapply(lapply,list.rbind) %>%
                    lapply(lapply,gcj02_wgs84_matrix_matrix) %>%
```

```
                    lapply(lapply,list) %>%
                    lapply(st_multipolygon) %>%st_sfc(crs=4326)

zj_city <- st_sf(zj_city)
```

lapply

```
zj_city       <-zj_city$center %>%
                str_split(';') %>%
                lapply(str_split,',') %>%
                lapply(lapply,as.numeric) %>%
                lapply(list.rbind) %>% list.rbind %>%
                gcj02_wgs84_matrix_df %>%
                bind_cols(zj_city)
zj_city<-st_sf(zj_city)
```

```
library(showtext)
```

```
## Loading required package: sysfonts
```

```
## Loading required package: showtextdb
```

```
showtext_auto()                  # ggplot2
ggplot() + geom_sf(data=zj_city) +geom_text(data=zj_city,aes(x=wgs84_lng,y=wgs84_lat,label=name))
```

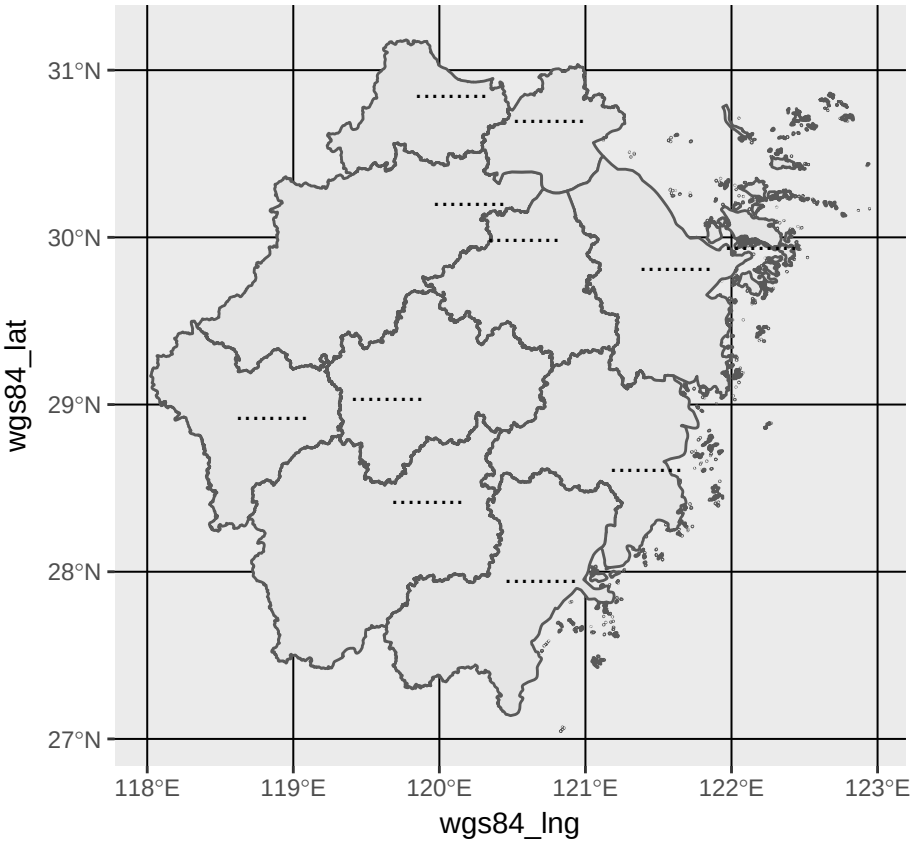
31°N
30°N
29°N
28°N
27°N
wgs84_lat
118°E
119°E
120°E
121°E
122°E
123°E
wgs84_lng

Figure 2: