

```

## Load libraries
library(splines)
library(MASS)
library(FDRreg)

## Loading required package: fda
## Warning: package 'fda' was built under R version 3.3.3
## Loading required package: Matrix
##
## Attaching package: 'fda'
## The following object is masked from 'package:graphics':
##
##      matplot
## Loading required package: BayesLogit
## Warning: package 'BayesLogit' was built under R version 3.3.2
## Loading required package: mvtnorm
## Warning: package 'mvtnorm' was built under R version 3.3.2

library(curl)

library(doParallel) ##to make cluster (on Windows)

## Loading required package: foreach
## Loading required package: iterators
## Loading required package: parallel

library(foreach) ##to use foreach function that does the parallel processing
library(doRNG) ##for reproducible seeds when doing parallel processing

## Loading required package: rngtools
## Warning: package 'rngtools' was built under R version 3.3.2
## Loading required package: pkgmaker
## Warning: package 'pkgmaker' was built under R version 3.3.2
## Loading required package: registry
## Warning: package 'registry' was built under R version 3.3.2
##
## Attaching package: 'pkgmaker'
## The following object is masked from 'package:base':
##
##      isNamespaceLoaded

##Source functions
source("../functions.R")

options(warn=1)

```

Define nulltype for Scott method:

```
nulltype <- "empirical"
```

Simulations are performed for a variety of alternative distributions:

```
altsGrid <- as.matrix(expand.grid(dist=c("z","t"),nrBlocks=c(10,20),corr=c(0.2,0.5,0.9)))
alts <- apply(altsGrid, 1, function(x){paste("alt",x[1],"large",x[2],x[3],sep="_")})
alts

## [1] "alt_z_large_10_0.2" "alt_t_large_10_0.2"
## [3] "alt_z_large_20_0.2" "alt_t_large_20_0.2"
## [5] "alt_z_large_10_0.5" "alt_t_large_10_0.5"
## [7] "alt_z_large_20_0.5" "alt_t_large_20_0.5"
## [9] "alt_z_large_10_0.9" "alt_t_large_10_0.9"
## [11] "alt_z_large_20_0.9" "alt_t_large_20_0.9"
```

1 Probability of being a false positive is linear

Perform estimation and save estimates:

```
set.seed(880184)

for(alt in alts)
{
  print(alt)

  load(paste(alt,"simResults_5.RData",sep="/"))
  ntest <- ncol(zValuesSims)

  pi0hatScottMat_emp <- estimate_Scott_sims(zValuesSims, tme, nulltype)

  pi0hatScottMean_emp <- colMeans(pi0hatScottMat_emp[,1:ntest])
  pi0hatScottVar_emp <- apply(pi0hatScottMat_emp[,1:ntest],2,var)

  pi0hat.ScottMat_emp <- pi0hatScottMat_emp[,1:ntest]
  FDR.ScottMat_emp <- pi0hatScottMat_emp[, (ntest+1):(2*ntest)]

  ##save full results
  save(file=paste(alt,"simResults_pi0x_Scott_emp_5_full.RData",sep="/"),
       list=c("pi0hat.ScottMat_emp", "FDR.ScottMat_emp"))

  ##save summary results
  save(file=paste(alt,"simResults_pi0x_Scott_emp_5.RData",sep="/"),
       list=c("tme", "pi0",
              "pi0hatScottMean_emp", "pi0hatScottVar_emp"))
}
```

```

}

## [1] "alt_z_large_10_0.2"
## [1] "alt_t_large_10_0.2"
## [1] "alt_z_large_20_0.2"
## [1] "alt_t_large_20_0.2"
## [1] "alt_z_large_10_0.5"
## [1] "alt_t_large_10_0.5"
## [1] "alt_z_large_20_0.5"
## [1] "alt_t_large_20_0.5"
## [1] "alt_z_large_10_0.9"
## [1] "alt_t_large_10_0.9"
## [1] "alt_z_large_20_0.9"
## [1] "alt_t_large_20_0.9"

```

Session info:

```

devtools::session_info()

## Session info -----

##   setting      value
##   version      R version 3.3.1 (2016-06-21)
##   system       x86_64, mingw32
##   ui           RTerm
##   language     (EN)
##   collate      English_United States.1252
##   tz           America/New_York
##   date         2018-09-04

## Packages -----

##   package      * version date
##   assertthat   0.1      2013-12-06
##   BayesLogit   * 0.6      2016-10-20
##   bindr        0.1      2016-11-13
##   bindrcpp     0.2      2017-06-17
##   codetools    0.2-14   2015-07-15
##   colorspace   1.2-6    2015-03-11
##   curl         * 0.9.7    2016-04-10
##   devtools     1.12.0   2016-06-24
##   digest       0.6.12   2017-01-27
##   doParallel   * 1.0.10   2015-10-14
##   doRNG        * 1.6      2014-03-07
##   dplyr        0.7.4    2017-09-28
##   evaluate     0.10     2016-10-11
##   fda          * 2.4.4    2014-12-16

```

```

## FDRreg      * 0.2-1  2017-05-03
## foreach     * 1.4.3  2015-10-13
## ggdendro    0.1-20  2016-04-27
## ggplot2     2.2.1   2016-12-30
## glue        1.1.1   2017-06-21
## gridExtra   2.2.1   2016-02-29
## gtable      0.2.0   2016-02-26
## highr       0.6     2016-05-09
## iterators   * 1.0.8  2015-10-13
## knitr       * 1.17   2017-08-10
## lattice     0.20-33 2015-07-14
## lazyeval    0.2.0   2016-06-12
## magrittr    1.5     2014-11-22
## MASS        * 7.3-45 2016-04-21
## Matrix      * 1.2-6   2016-05-02
## memoise     1.0.0   2016-01-29
## mosaic      0.14.4  2016-07-29
## mosaicData  0.14.0  2016-06-17
## munsell     0.4.3   2016-02-13
## mvtnorm     * 1.0-6   2017-03-02
## pkgconfig   2.0.1   2017-03-21
## pkgmaker    * 0.22   2014-05-14
## plyr        1.8.4   2016-06-08
## purrr       0.2.4   2017-10-18
## R6          2.1.2   2016-01-26
## Rcpp        0.12.13 2017-09-28
## registry    * 0.3    2015-07-08
## rlang       0.1.4   2017-11-05
## rngtools    * 1.2.4   2014-03-06
## scales      0.4.1   2016-11-09
## stringi     1.1.1   2016-05-27
## stringr     1.2.0   2017-02-18
## tibble      1.3.3   2017-05-28
## tidyr       0.7.2   2017-10-16
## withr       1.0.2   2016-06-20
## xtable      1.8-2   2016-02-05
## source
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## Github (jgscott/FDRreg@8025d1a)
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