

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

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

1 Probability of being a false positive as a linear function of time

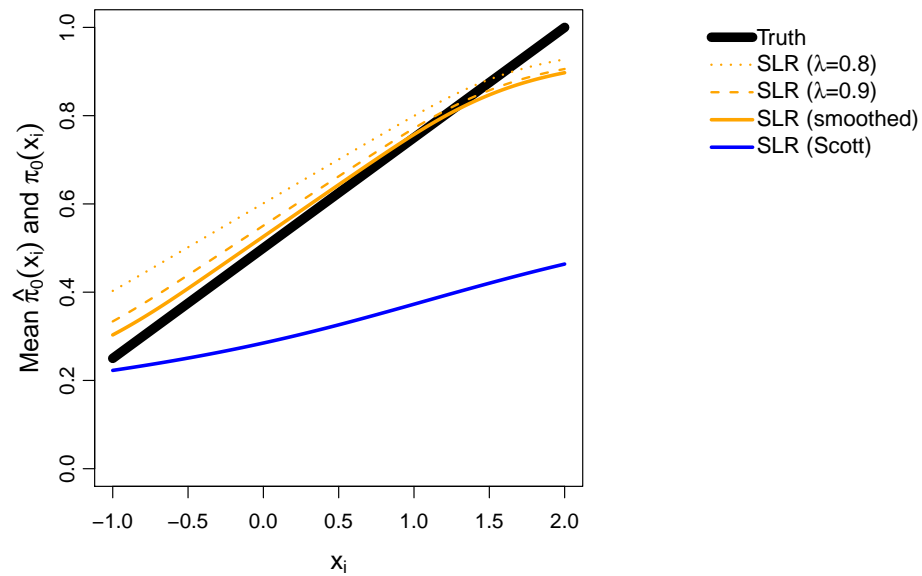
Load results:

```
load("simResults_pi0x_thresh_1.RData")
load("simResults_pi0x_Scott_1.RData")
```

1.1 Plot for means

```
plotMeanPi0(pi0, pi0MeansVars, pi0hatScottMean, tme=tme)

legend("topright", inset=c(-0.71,0),
      legend=c("Truth", expression(paste("SLR (", lambda, "=0.8)")),
               expression(paste("SLR (", lambda, "=0.9)")),
               "SLR (smoothed)", "SLR (Scott)"),
      col=c("black", "orange", "orange", "orange", "blue"), bty="n",
      lwd=c(8,2,2,3,3), lty=c(1,3,2,1,1),
      cex=1.2, x.intersp=0.2, y.intersp=1.0)
```



2 Probability of being a false positive as a smooth function of time

Load results:

```
load("simResults_pi0x_thresh_2.RData")
load("simResults_pi0x_Scott_2.RData")
```

2.1 Plot for means

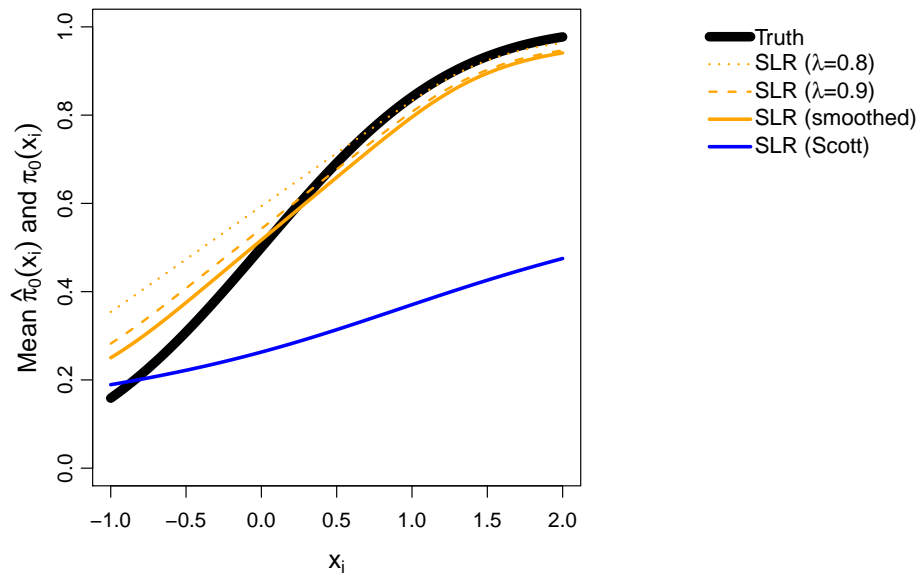
```
plotMeanPi0(pi0, pi0Lin.MeansVars, pi0hatLin.ScottMean, tme=tme)

legend("topright", inset=c(-0.71,0), ##x=-0.2, y=0.45, ##"bottomright", ##x=-100, y=0.3,
       legend=c("Truth",
                 expression(paste("SLR (", lambda, "=0.8)")),
                 expression(paste("SLR (", lambda, "=0.9)")),
                 "SLR (smoothed)",
                 "SLR (Scott)"),
       col=c("black",
             rep("orange", 3),
             "blue"))
```

```

"blue"),
bty="n",
lwd=c(8,2,2,3,3), lty=c(1,3,2,1,1),
cex=1.2, x.intersp=0.2, y.intersp=1.0)

```

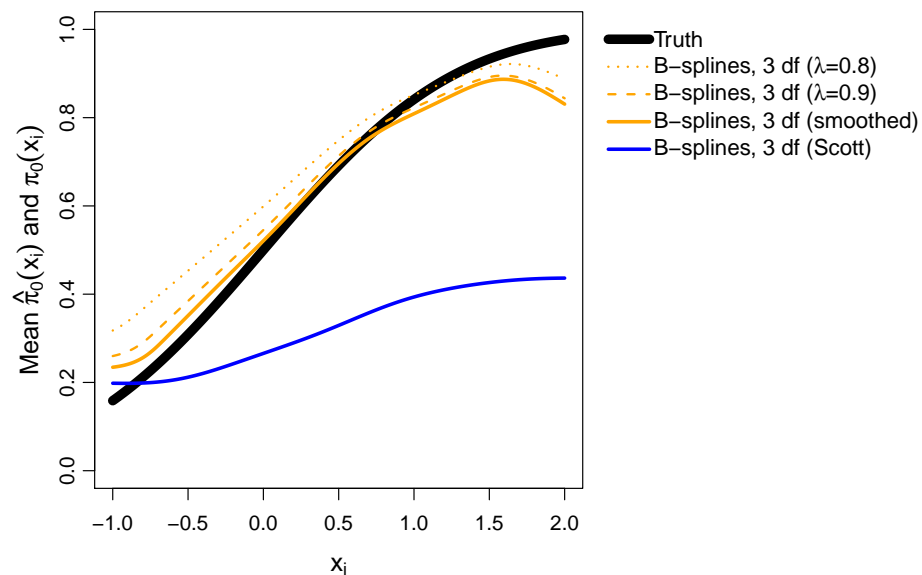


```

plotMeanPi0(pi0, pi0Spl.MeansVars, pi0hatSpl.ScottMean, tme=tme)

legend("topright", inset=c(-0.71,0), ##x=-0.2, y=0.45, ##"bottomright", ##x=-100, y=0.3,
       legend=c("Truth",
                 expression(paste("B-splines, 3 df (", lambda, "=0.8)")),
                 expression(paste("B-splines, 3 df (", lambda, "=0.9)")),
                 "B-splines, 3 df (smoothed)",
                 "B-splines, 3 df (Scott)"),
       col=c("black",
              rep("orange",3),
              "blue"),
       bty="n",
       lwd=c(8,2,2,3,3), lty=c(1,3,2,1,1),
       cex=1.2, x.intersp=0.2, y.intersp=1.0)

```



3 Probability of being a false positive as a sine + step function

Load results:

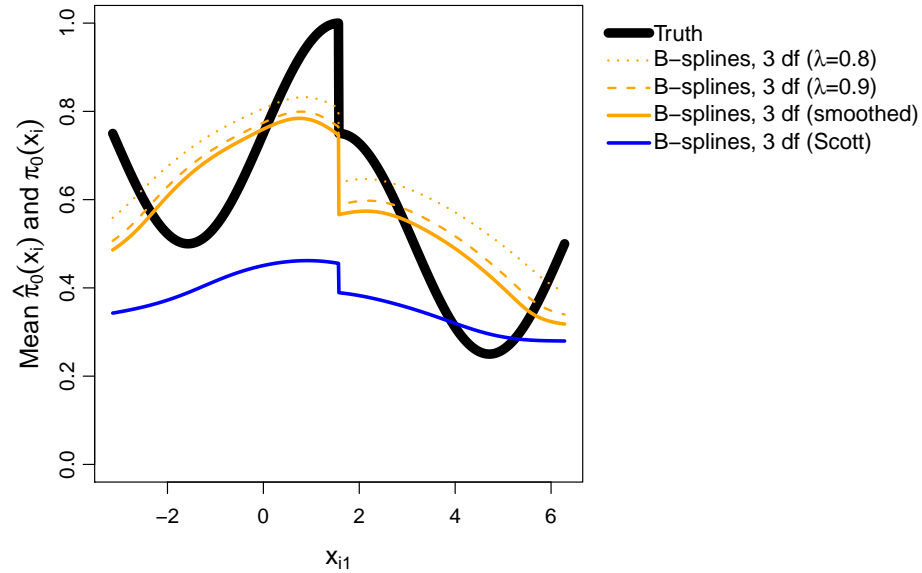
```
load("simResults_pi0x_thresh_3.RData")
load("simResults_pi0x_Scott_3.RData")
```

3.1 Plot for means

```
plotMeanPi0(pi0, pi0_3.MeansVars, pi0hat3.ScottMean, tme=tme1, TRUE)

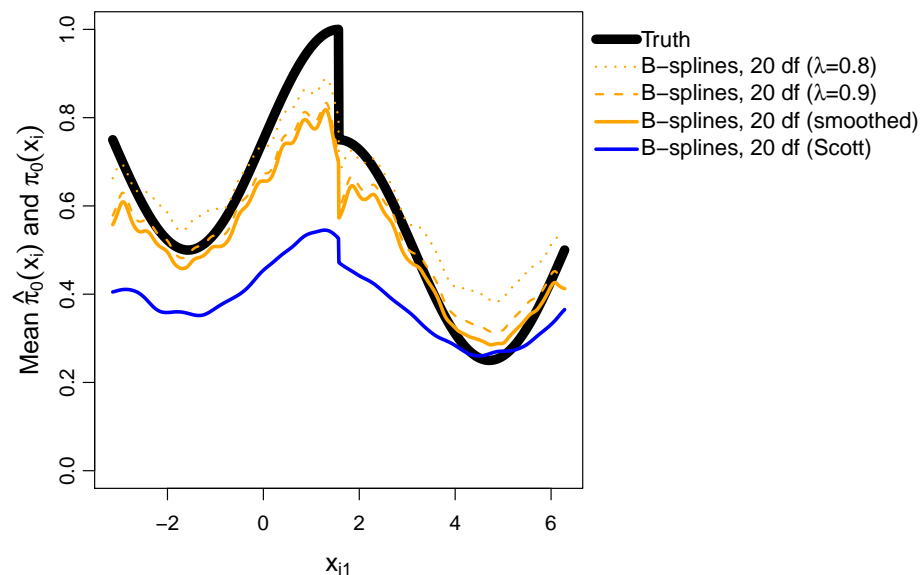
legend("topright", inset=c(-0.71,0),
      legend=c("Truth",
               expression(paste("B-splines, 3 df (", lambda, "=0.8)")),
               expression(paste("B-splines, 3 df (", lambda, "=0.9)")),
               "B-splines, 3 df (smoothed)",
               "B-splines, 3 df (Scott)"),
      col=c("black", rep("orange",3), "blue"),
      bty="n",
```

```
lwd=c(8,2,2,3,3), lty=c(1,3,2,1,1),
cex=1.2, x.intersp=0.2, y.intersp=1.0)
```



```
plotMeanPi0(pi0, pi0_20.MeanVars, pi0hat20.ScottMean, tme=tme1, TRUE)

legend("topright", inset=c(-0.71,0),
      legend=c("Truth",
                expression(paste("B-splines, 20 df (", lambda, "=0.8)")),
                expression(paste("B-splines, 20 df (", lambda, "=0.9)")),
                "B-splines, 20 df (smoothed)",
                "B-splines, 20 df (Scott)"),
      col=c("black", rep("orange",3), "blue"),
      bty="n",
      lwd=c(8,2,2,3,3), lty=c(1,3,2,1,1),
      cex=1.2, x.intersp=0.2, y.intersp=1.0)
```



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 2017-01-04

## Packages -----
## package * version date source
## devtools 1.12.0 2016-06-24 CRAN (R 3.3.1)
## digest 0.6.9 2016-01-08 CRAN (R 3.3.1)
## evaluate 0.10 2016-10-11 CRAN (R 3.3.2)
## highr 0.6 2016-05-09 CRAN (R 3.3.1)
## knitr * 1.15.1 2016-11-22 CRAN (R 3.3.2)
## magrittr 1.5 2014-11-22 CRAN (R 3.3.1)
## MASS * 7.3-45 2016-04-21 CRAN (R 3.3.1)
```

##	memoise	1.0.0	2016-01-29	CRAN (R 3.3.1)
##	stringi	1.1.1	2016-05-27	CRAN (R 3.3.0)
##	stringr	1.0.0	2015-04-30	CRAN (R 3.3.1)
##	withr	1.0.2	2016-06-20	CRAN (R 3.3.1)