plpGamms

```
require(tidyverse)
require(mgcv)
require(mgcViz)
require(itsadug)
```

Load prepared plp data

```
setwd("C:/Users/Helen/Desktop/Stats/Pruned3_big")

plpData = read.csv("plp_ready_for_gamms.csv")

plpData$speaker = as.factor(plpData$speaker)
plpData$label = as.factor(plpData$label)
```

GAM with tensor product interaction for plp

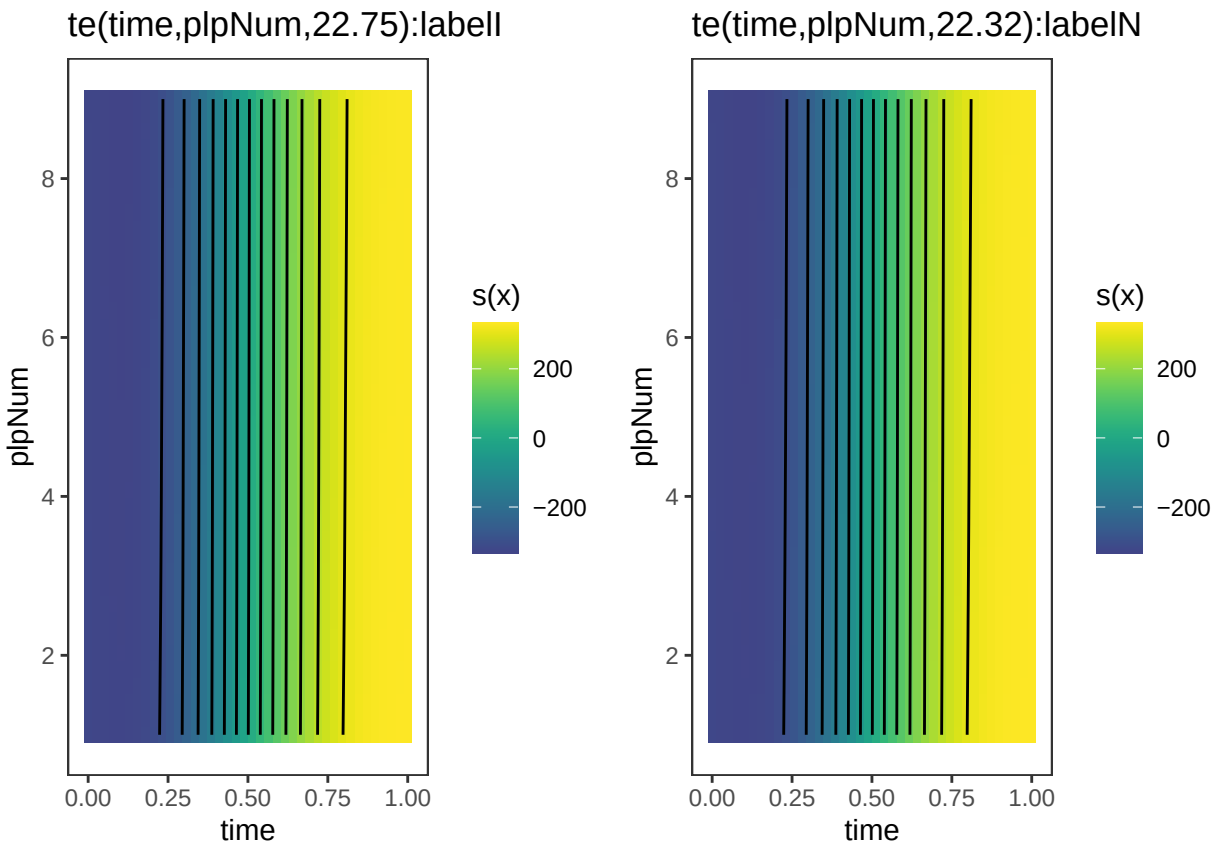
```
m1plp=bam(plp ~ label + te(time, plpNum, by=label) + s(time, speaker, bs="fs", m=1)
          + s(plpNum, speaker, bs="fs", m=1), data=plpData)
m1plpViz = getViz(m1plp)
```

```
summary(m1plp)
```

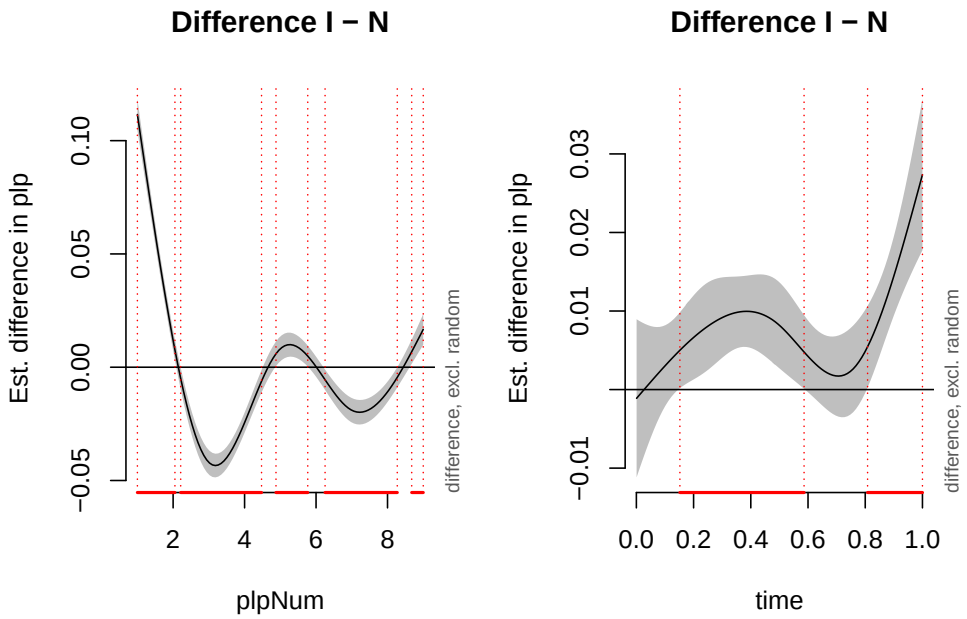
```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## plp ~ label + te(time, plpNum, by = label) + s(time, speaker,
##     bs = "fs", m = 1) + s(plpNum, speaker, bs = "fs", m = 1)
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.3321884  0.1219073   2.725  0.00643 **
## labelN      -0.0126166  0.0005732 -22.012  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##                            edf Ref.df     F p-value
## te(time,plpNum):labelI   22.75  22.76 61026  <2e-16 ***
## te(time,plpNum):labelN   22.32  22.33 62219  <2e-16 ***
## s(time,speaker)         101.45 107.00 12000  <2e-16 ***
## s(plpNum,speaker)       100.36 106.00 36362  <2e-16 ***
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.894   Deviance explained = 89.4%
## fREML = 3.2379e+06  Scale est. = 0.3048    n = 3923100
```

```
print(plot(m1plpViz, allTerms=T, rm.ranef = FALSE) + scale_y_continuous(
    breaks = c(2, 4, 6, 8),
    labels = c("2", "4", "6", "8")), pages=3)
```




```
par(mfrow=c(1, 2))
plot_diff(m1plp, view="plpNum", shade=TRUE, comp=list(label=c("I", "N")),
          rm.ranef = TRUE)
plot_diff(m1plp, view="time", shade=TRUE, comp=list(label=c("I", "N")),
          rm.ranef = TRUE)
```




```
par(mfrow=c(1, 1))
par(mar=c(5, 5, 3, 8))
plot_diff2(m1plp, view=c("time", "plpNum"), comp=list(label=c("I", "N")),
           main="Difference by label", rm.ranef = TRUE)
```