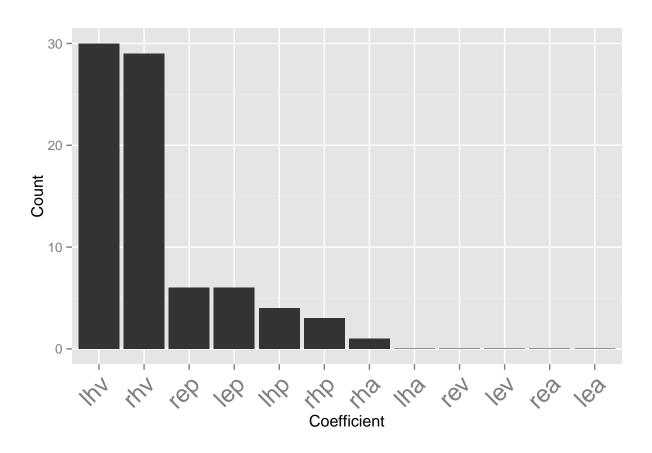
NRGFigs

```
library(knitr)
library(ggplot2)
library(dplyr)
library(tidyr)
library(xtable)
filename<-"~/MATLAB/NeurophysNRG/bestFitLRResort.csv"
d <- read.csv(filename, na.strings="NaN")</pre>
r<-read.csv('peakregressions.csv')
gs<-read.csv('~/MATLAB/NeurophysNRG/fitGSPlm.csv')</pre>
r<-r[,2:12]
ptab<-subset(d,d$rsquared>0)
tab<-xtable(ptab[,1:4],caption='This table shows the results of a step-wise fitting procedure that with
print(tab,comment=FALSE)
s<-d %>%
  select(rhv:lea) %>%
  mutate_each(funs(!is.na(.))) %>%
  summarise_each(funs(sum)) %>%
  gather('c','n',1:12) %>%
  mutate(c=reorder(c,desc(n)))
p<-ggplot(aes(y=n),data=s)+theme(axis.text.x=element_text(size=18,angle=45, hjust=1))
p+geom_bar(aes(x=s$c), stat='identity')+xlab('Coefficient')+ylab('Count')
```



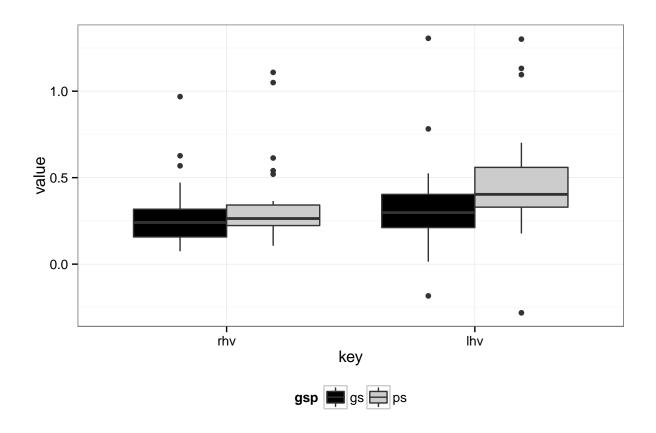
```
staticBestFitLR <- read.csv("~/MATLAB/NeurophysNRG/Resort/staticBestFitLR.csv", na.strings="NaN")
staticBestFitLR %>%
  select(1:6) %>%
  rename(Rightward.Eye=rep,Leftward.Eye=lep,Rightward.Head=rhp) %>%
  gather('coef','b',4:6) %>%
  group_by(Neuron) %>%
  summarise(Coef=max(b),Position.Type=coef[b==Coef]) %>%
  arrange(desc(Coef))-> t
caption.static<-'Coefficient of Static Acitivy. This table shows the fit value for the position parameter static.table<-xtable(t)
  print(static.table,comment=FALSE)</pre>
```

```
g<-subset(gs,rsquared>0) #gs loaded in first chunk
tall<-g %>% gather(key,value,c(6,7,8,9,10,12))

#tall$key<-factor(tall$key,levels=c('rhv','lhv','rep','lep','rhp','rha'))
#qplot(value,facets=key~.,data=tall,fill=tall$gsp,binwidth=0.1)+scale_fill_discrete(name="Trial\nType")

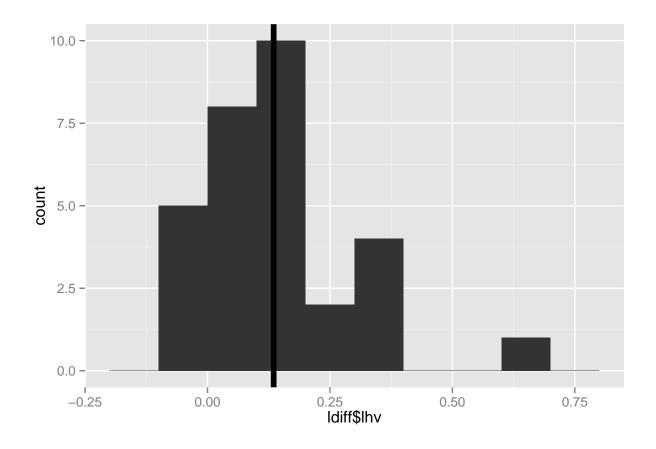
tall<-g %>% gather(key,value,c(6,7))
#qplot(value,facets=key~.,data=tall,fill=tall$gsp,binwidth=0.1)+scale_fill_discrete(name="Trial\nType")

qplot(key,value,data=tall,geom='boxplot',fill=gsp)+
    scale_fill_grey(start=0)+
    theme_bw()+
```

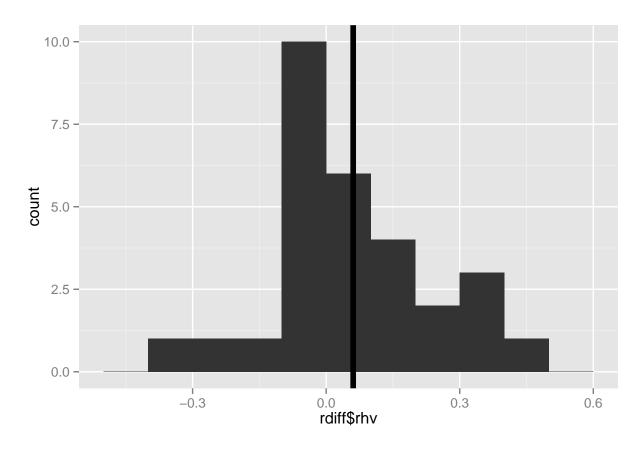


```
g %>%
    select(1,5,6) %>%
    spread(gsp,rhv) %>%
    mutate(rhv=ps-gs)-> rdiff
g %>%
    select(1,5,7) %>%
    select(1,5,7) %>%
    spread(gsp,lhv) %>%
    mutate(lhv=ps-gs)-> ldiff

rd<-t.test(rdiff$rhv)
ld<-t.test(ldiff$lhv)
qplot(ldiff$lhv,binwidth=0.1)+geom_vline(x=ld$estimate,size=2)</pre>
```



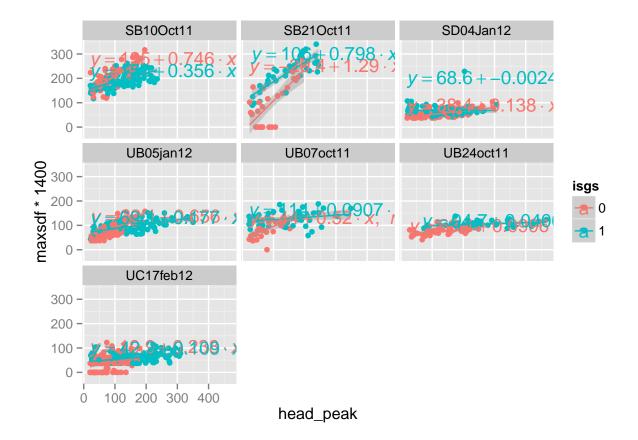
qplot(rdiff\$rhv,binwidth=0.1)+geom_vline(x=rd\$estimate,size=2)



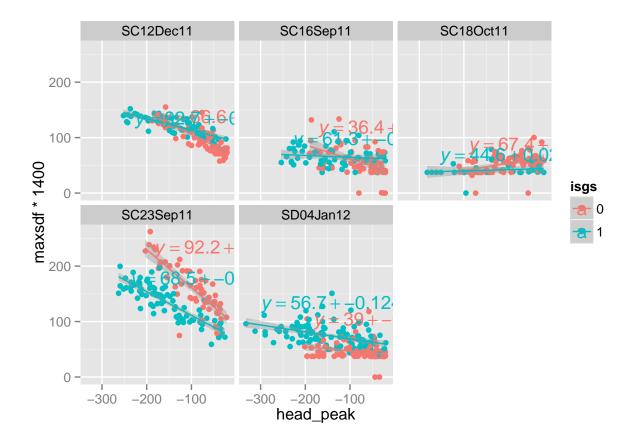
```
p<-read.csv('~/MATLAB/NeurophysNRG/peakAnalysis.csv',na.strings="NaN")
source('~/MATLAB/NeurophysNRG/RCode/StatSmoothFunc.R')
qplot(head_peak,maxsdf*1400,data=subset(p,head_peak>0))+
  facet_wrap(~Neuron,ncol=2)+
  stat_smooth_func(method='lm',geom='text',parse=TRUE,hjust=0)+stat_smooth(method='lm')
```

3	00 -	SB04Nov11	\$805Oct11
	00 -	y = 484 = 0.0877 x, r ² = 0.136 \$8070ct11	$x_1 = 55 = 0.253$ SB10Jan12
3	00 - 00 -	$y = 126 + 0.132 \cdot x$, $r^2 = 0.02$	$y = 83.8 + 0.237 \cdot x$, $r^2 = 0.0707$
	00 -	SB100ct11	SB15Sep11
3	00 - 00 -	SB100ct11 $v = 112 + 0.523 - x, r^2 = 0.553$	
- 1	00 -	SB16Sep11	$y = 1.7 + 1.0 229 x$, $r^2 = 0.329$ SB180ct11
2	00 - 00 - 00 -		$y = 52.4 + 0.28 \cdot x$, $r^2 = 0.296$
	100 - 0 - 400 - 300 - 200 -	$x = 22.9 + 0.198 \cdot x$, $r^2 = 0.162$ SB19Jan12	00010 111
3		100 20 S 100 41 11 2 0 0700	$y = 41.3 + 1.00 + r^2 = 0.643$
	0 -	29.3 + 0.11. x, r ² = 0.0798 SB28Sep11	SB30Sep11
3	00 = 00 = 00 =	y = 57, 7 ± 0.37 ± x = 2 = 0.497	$y = 35.6 + 0.281 \cdot x$, $r^2 = 0.281$
	0 =	SC070ct11	SC12Dec11
2	00 - 00 -	r ² = 0.214	$x = 50.24$ 0.406 x , $r^2 = 0.422$
	0 -	SC140ct11	SC15Sep11
2	00 - 00 -	v = 43.9 + 91143 · v - r ² = 0.238	$x = 60.2 \cdot 0.24 \cdot x$, $r^2 = 0.155$
4	0 -	SC16Sep11	SC18Oct11
2	00 - 00 - 00 -	$y = 18.1 + 0.256 \cdot x$, $r^2 = 0.275$	$y = 45.5 + 0.396 \cdot x$, $r^2 = 0.506$
	0 -	SC19Jan12	SC19Oct11
2	00 -	$y = 83.8 + 0.00441 \cdot x$, $r^2 = 0.000$	54 7 20070 x, r ² = 0.107
4	00 -	SC21Dec11	SC23Sep11
2	00 -	$v = 60.4 + 0.104 \cdot x$, $r^2 = 0.0723$	$r^2 = 0.000$
	00 -	SC28Nov11	SD03Nov11
		$r^2 = 0.0845$	$y = 60.1 + -0.0221 \cdot x$, $r^2 = 0.003$
	00 -	SD04Jan12	SD06Dec11
	00 -	$y = 39.5 + 0.152 \cdot x$, $r^2 = 0.234$	$y = 63.6 \pm 0.294 \cdot x$, $y^2 = 0.166$
Ĕз	00 -	SD09Jan12 $y = 81.7 + -0.0847 \cdot x, r^2 = 0.0164$	SD13Jan12 $y = 145 + -0.0127 \cdot x, r^2 = 0.000$
1	00 -	SD21Sep11	SD28Sep11
3	00 -	$y = 37.4 + 0.496 \cdot x$, $r^2 = 0.269$	
1	00 -	SD30Sep11	$y = 44.7 + 0.0966 \cdot x$, $r^2 = 0.106$ SE170ct11
3	00 = 00 = 00 =	SD30Sep11 y = 181 + 10587 · x, r ² = 0.186	
- 1	00 -	UB04jun12	$y = 61.24 + 0.256 \cdot x$, $r^2 = 0.283$ UB04nov11
2	00 = 00 = 00 =	$y = 66.3 + 0.154 \cdot x$, $r^2 = 0.0636$	
1	0 -	UB05jan12	y 43.2+0.192 x 2 40.479 UB07cct11
3 2	00 = 00 = 00 =	v = 43.0.40.32 0.551	y 57.6 10.285 ta, 1 ² =0.453
	0 -	UB11jan12	UB14dec11
3	00 -	$y = 123 + 0.222 \cdot x$, $r^2 = 0.118$	16.8 <u>0.127</u> 2 0.293
	0 -	UB14may12	UB16/eb12
2	00 - 00 - 00 -	<u>x</u> <u>x</u> 54.8 0.0284 x	$v = 41.2 \pm 0.0263 \cdot x, r^2 = 0.000$
	0 -	UB22may12	UB23feb12
2	00 -	<u>y = 31+10 241 + 4, -2 = 0.576</u>	#-54-048-x, ² -0:843
	00 -	UB23mar12	UB24cct11
2	00 -	12.6 + 0.191 - 2, $\sqrt{2}$ = 0.437	¥ = 58 1± 0 158 ± , +2 ±0.565
	00 -	UB26mar12	UB28sep11
2	00 -	7 - 30 2 +0 246 × -2 -0 487	V= 570+00114 × 2=0.003
3	00 -	UC03jan12	UC17feb12
1	00 -	$x = 40.2 + 9.476 \cdot x$, $r^2 = 0.252$	UD16sep11
3	00 -	UC22may12	
	00 -	¥ = 15.6 ± 0.34 - x, r ² = 0.579 UE31oct11	$v = 55.3 + 20.0194 \cdot x$, $r^2 = 0.00$
3	00 - 00 -		
	00 -	y = 35.3 + 0.118, x, r ² = 0.192	nook
		head_	peak

```
p$isgs<-as.factor(p$isgs)
p %>%
  group_by(Neuron) %>%
  do(p.right=summary(lm(maxsdf ~ head_peak,data=filter(.,head_peak>20)))$coefficients[8],
     p.left=summary(lm(maxsdf ~ head_peak,data=filter(.,head_peak< -20)))$coefficients[8],
     p.left.slope=
       summary(lm(maxsdf ~ head_peak*isgs,data=filter(.,head_peak< -20)))$coefficients[16],</pre>
     p.left.int=
       summary(lm(maxsdf ~ head_peak*isgs,data=filter(.,head_peak< -20)))$coefficients[15],</pre>
     p.right.slope=
       summary(lm(maxsdf ~ head_peak*isgs,data=filter(.,head_peak>20)))$coefficients[16],
     p.right.int=
       summary(lm(maxsdf ~ head_peak*isgs,data=filter(.,head_peak>20)))$coefficients[15]) ->
  mm
pp<-merge(mm,p,by="Neuron")</pre>
qplot(head_peak,maxsdf*1400,col=isgs,data=filter(pp,head_peak> 20,p.right<0.001,p.right.slope<0.001 | p</pre>
```



qplot(head_peak,maxsdf*1400,col=isgs,data=filter(pp,head_peak< -20,p.left<0.001,p.left.slope<0.001 | p.</pre>



	Neuron	shift	rsquared	f
1	SB21Oct11	120	0.77	$fr \sim 1 + rhv + rep$
2	UB21dec11	60	0.70	$\text{fr} \sim 1 + \text{lep}$
3	UB22may12	70	0.64	$fr \sim 1 + rhv + lhv$
4	SE17Oct11	150	0.58	$fr \sim 1 + rhv$
5	SB10Oct11	170	0.58	$fr \sim 1 + rhp + rhv$
6	UC22may12	80	0.57	$fr \sim 1 + rhv + lhv$
7	SC23Sep11	130	0.47	fr $\sim 1 + lhv$
8	UBA4jun12	90	0.46	$fr \sim 1 + rhv + lhv$
9	SD09Jan12	130	0.41	fr $\sim 1 + lhv$
10	UB23mar12	80	0.40	$fr \sim 1 + lhv + rep$
11	SC12Dec11	70	0.40	$\text{fr} \sim 1 + \text{lhv}$
12	UB16feb12	90	0.40	$\text{fr} \sim 1 + \text{lhv}$
13	UB05jan12	60	0.39	$fr \sim 1 + lhp + lhv + rha$
14	SB15Sep11	110	0.37	$fr \sim 1 + rhv$
15	UB28sep11	20	0.35	$fr \sim 1 + rhp + rhv + rep$
16	SD03Nov11	160	0.34	$\text{fr} \sim 1 + \text{lhv}$
17	SC18Oct11	40	0.33	$\text{fr } \sim 1 + \text{rhv} + \text{lep}$
18	SB16Sep11	70	0.32	$fr \sim 1 + lhv$
19	UD16sep11	130	0.32	fr ~ 1 + lhv
20	UB04nov11	70	0.31	$fr \sim 1 + rhv + lhv$
$\frac{1}{21}$	UBB4jun12	130	0.30	$fr \sim 1 + rhv + lhv$
22	SB18Oct11	70	0.30	$\operatorname{fr} 1 + \operatorname{rhv}$
23	UB26mar12	80	0.30	$\text{fr } \sim 1 + \text{lhv}$
$\frac{2}{24}$	UE31oct11	40	0.29	$\text{fr } \sim 1 + \text{rhv} + \text{lhv}$
25	SC21Dec11	130	0.29	$fr \sim 1 + lhv$
26	SC07Oct11	80	0.28	$fr \sim 1 + lhp + lhv$
$\frac{1}{27}$	SD13Jan12	190	0.27	fr ~ 1 + lhv
28	UC17feb12	100	0.26	$\text{fr } \sim 1 + \text{lhv} + \text{rep}$
29	SC16Sep11	60	0.26	$\text{fr } \sim 1 + \text{lhv} + \text{lep}$
30	UB24oct11	50	0.24	$fr \sim 1 + rhv$
31	UC03jan12	110	0.23	$\text{fr} \sim 1 + \text{lhv} + \text{rep}$
32	UB14may12	100	0.23	$\text{fr } \sim 1 + \text{rhv} + \text{lhv}$
33	SC19Oct11	70	0.22	$fr \sim 1 + rhv$
34	SD30Sep11	200	0.22	$fr \sim 1 + rhp + rhv$
35	SC28Nov11	110	0.21	$\text{fr } \sim 1 + \text{lhv} + \text{lep}$
36	SC14Oct11	180	0.20	$fr \sim 1 + rhv$
37	SD04Jan12	60	0.20	fr ~ 1 + rhv
38	SC19Jan12	190	0.20	$fr \sim 1 + lhv$
39	SB28Sep11	50	0.19	$fr \sim 1 + rhv + lep$
40	SD21Sep11	60	0.18	$fr \sim 1 + rhv + lhv$
41	SB05Oct11	80	0.17	$fr \sim 1 + rhv + lhv$
42	SB10Jan12	90	0.17	$\text{fr } \sim 1 + \text{lhv} + \text{lep}$
43	SB30Sep11	130	0.16	$\operatorname{fr} 1 + \operatorname{rhv} $
44	SB19Jan12	120	0.16	$fr \sim 1 + rhv$
45	SD06Dec11	50	0.15	$fr \sim 1 + rhv + lhv$
46	SB04Nov11	90	0.15	$fr \sim 1 + rhv + lhv$
47	UB07oct11	80	0.14	$\operatorname{fr} \sim 1 + \operatorname{lhv} + \operatorname{hhv}$
48	UB23feb12	50	0.11	$\operatorname{fr} \sim 1 + \operatorname{rhv}$
49	SD28Sep11	130	0.19	$\operatorname{fr} \sim 1 + \operatorname{rep}$
50	UB11jan12	40	0.06	fr ~ 1 + lhp
51	SB07Oct11	200	0.05	$\operatorname{fr} \sim 1 + \operatorname{rhv}$
	250100011	200	0.00	1 111V

Table 1: This table shows the results of a step-wise fitting procedure that with a threshold for inclusion of an increase of 0.5 in the R2

	Neuron	Coef	Position.Type
1	UB21dec11	7.97	Leftward.Eye
2	SB28Sep11	2.49	Rightward.Head
3	SB21Oct11	2.07	Rightward.Eye
4	SC18Oct11	1.11	Rightward.Head
5	SB10Oct11	0.97	Rightward.Eye
6	SC28Nov11	0.95	Rightward.Eye
7	UB05jan12	0.87	Rightward.Head
8	SC16Sep11	0.74	Rightward.Eye
9	UB28sep11	0.69	Rightward.Head
10	SC07Oct11	0.48	Rightward.Head
11	UC17 feb 12	0.47	Rightward.Head
12	UC03jan12	0.44	Rightward.Eye
13	UB23mar12	0.40	Rightward.Head