Yeti 3

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5      v purrr   0.3.4
## v tibble  3.1.2      v dplyr   1.0.6
## v tidyr   1.1.3      v stringr 1.4.0
## v readr   1.4.0      v forcats 0.5.1
```

```
## Warning: package 'ggplot2' was built under R version 4.1.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```
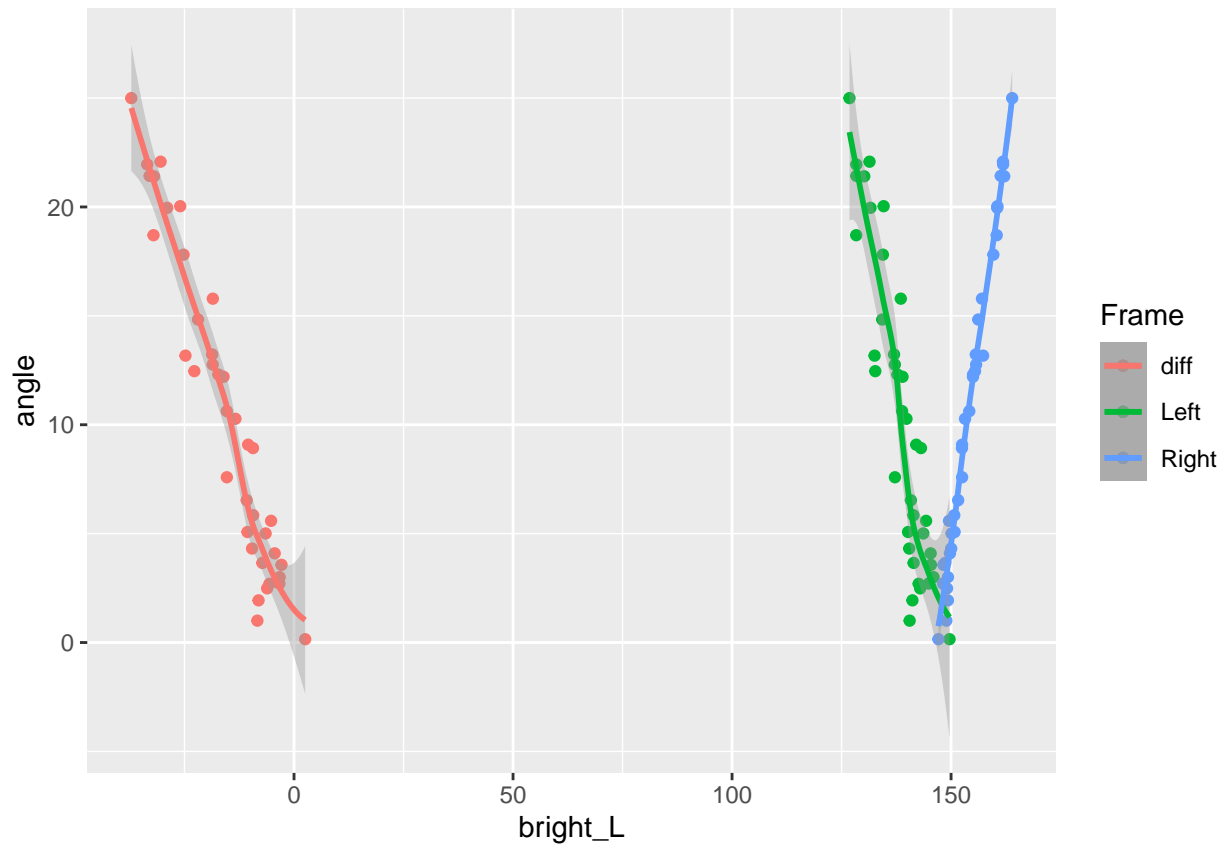
Horizontal

```r
fov <- 40 # field of view

D_yeti3 <- read_csv("Brightness_H.csv",
                    col_names = c("x", "bright_L", "bright_R", "bright_diff"),
                    col_types = cols(
                      x = col_double(),
                      bright_L = col_double(),
                      bright_R = col_double(),
                      bright_diff = col_double()
                    )) %>%
  mutate(angle = x/fov)
```

```r
D_yeti3 %>%
  ggplot(aes(y = angle)) +
  geom_point(aes(x = bright_L, col = "Left")) +
  geom_point(aes(x = bright_R, col = "Right")) +
  geom_point(aes(x = bright_diff, col = "diff")) +
  geom_smooth(aes(x = bright_L, col = "Left")) +
  geom_smooth(aes(x = bright_R, col = "Right")) +
  geom_smooth(aes(x = bright_diff, col = "diff")) +
  labs(col = "Frame")
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

```r
M_0 <- lm(x ~ bright_L * bright_R, data = D_yeti3)
M_1 <- lm(x ~ bright_L + bright_R, data = D_yeti3)
M_2 <- lm(x ~ bright_diff, data = D_yeti3)
M_3 <- lm(x ~ bright_L, data = D_yeti3)
M_4 <- lm(x ~ bright_R, data = D_yeti3)

AIC(M_0, M_1, M_2, M_3) %>%
  arrange(AIC)
```

```
##      df      AIC
## M_1   4 379.1480
## M_0   5 381.1293
## M_2   3 442.1058
## M_3   3 476.7332
```

Vertical

```r
fov <- 40 # field of view

D_yeti3 <- read_csv("Brightness_V.csv",
                    col_names = c("x", "bright_T", "bright_B", "bright_diff"),
                    col_types = cols(
                      x = col_double(),
```

```
                        bright_T = col_double(),
                        bright_B = col_double(),
                        bright_diff = col_double()
                     )) %>%
  mutate(angle = x/fov)
```

```
D_yeti3 %>%
  ggplot(aes(y = angle)) +
  geom_point(aes(x = bright_T, col = "Top")) +
  geom_point(aes(x = bright_B, col = "Bottom")) +
  geom_point(aes(x = bright_diff, col = "diff")) +
  geom_smooth(aes(x = bright_T, col = "Top")) +
  geom_smooth(aes(x = bright_B, col = "Bottom")) +
  geom_smooth(aes(x = bright_diff, col = "diff")) +
  labs(col = "Frame")
```

```
## 'geom_smooth()' using method = 'loess' and formula 'y ~ x'
## 'geom_smooth()' using method = 'loess' and formula 'y ~ x'
## 'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```
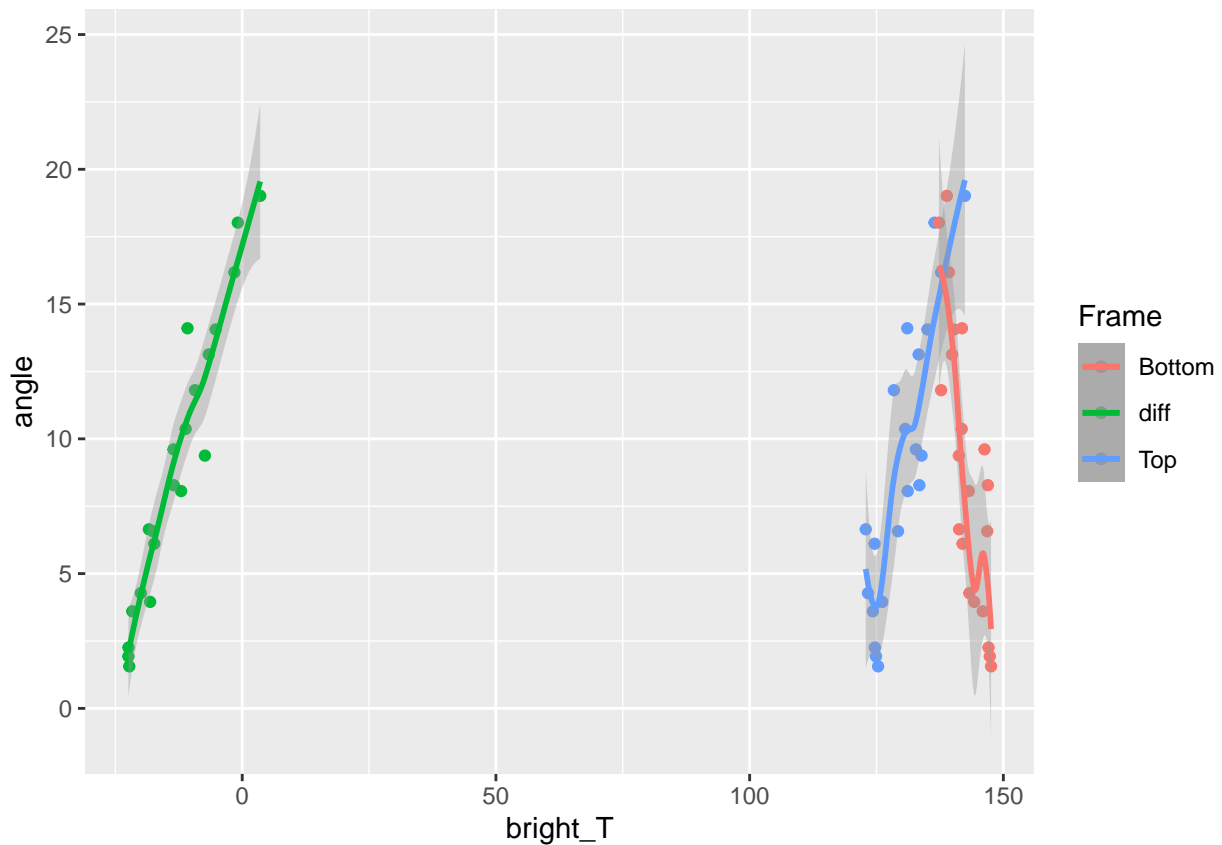


```
M_0 <- lm(x ~ bright_T * bright_B, data = D_yeti3)
M_1 <- lm(x ~ bright_T + bright_B, data = D_yeti3)
M_2 <- lm(x ~ bright_diff, data = D_yeti3)
M_3 <- lm(x ~ bright_T, data = D_yeti3)
```

```
M_4 <- lm(x ~ bright_B, data = D_yeti3)

AIC(M_0, M_1, M_2, M_3) %>%
  arrange(AIC)
```

```
##      df      AIC
## M_2  3 232.4798
## M_1  4 233.5975
## M_0  5 234.7351
## M_3  3 258.4298
```