

Aidan Data

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Read the Data

The data are CSV, but the column IDs are in the column before the data. There are a number of blank lines interspersed within the data.

Aidan indicates that the **RSSI** and **Distance** variables are the only important variables.

```
d <- 1
trial <- 2

dat <- read_csv("./AidanData/1m/Trial1.txt", col_names=FALSE) %>%
  select(X6, X14, X16) %>%
  rename(Rep = X6, RSSI = X14, Distance = X16) %>%
  mutate(d = d, trial = trial)
```

```
## Rows: 1000 Columns: 22
## -- Column specification -----
## Delimiter: ","
## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21
## dbl (10): X4, X6, X8, X10, X12, X14, X16, X18, X20, X22
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
summary(dat)
```

##	Rep	RSSI	Distance	d	trial
## Min.	: 1.0	Min. :-42.50	Min. :0.5957	Min. :1	Min. :2
## 1st Qu.:	250.8	1st Qu.:-40.50	1st Qu.:0.7079	1st Qu.:1	1st Qu.:2
## Median :	500.5	Median :-40.00	Median :1.0000	Median :1	Median :2
## Mean :	500.5	Mean :-39.26	Mean :0.9406	Mean :1	Mean :2
## 3rd Qu.:	750.2	3rd Qu.:-37.00	3rd Qu.:1.0593	3rd Qu.:1	3rd Qu.:2
## Max. :	1000.0	Max. :-35.50	Max. :1.3335	Max. :1	Max. :2

```
apply(dat,2,sd)
```

##	Rep	RSSI	Distance	d	trial
##	288.8194361	1.9325024	0.1949482	0.0000000	0.0000000

```
d <- 2
trial <- 3

dat <- read_csv("./AidanData/2m/Trial5.txt", col_names=FALSE)%>%
  select(X6, X14, X16) %>%
  rename(Rep = X6, RSSI = X14, Distance = X16) %>%
  mutate(d = d, trial = trial)
```

```
## Rows: 1000 Columns: 20
```

```
## -- Column specification -----
## Delimiter: ", "
## chr (11): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19
## dbl (9): X4, X6, X8, X10, X12, X14, X16, X18, X20
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
summary(dat)
```

```
##      Rep      RSSI      Distance      d      trial
## Min. :-47.00 Min. :1.122 Min. :0.000 Min. :2 Min. :3
## 1st Qu.:-47.00 1st Qu.:1.496 1st Qu.:0.000 1st Qu.:2 1st Qu.:3
## Median :-47.00 Median :1.679 Median :0.400 Median :2 Median :3
## Mean   :-46.97 Mean   :1.654 Mean   :1.038 Mean   :2 Mean   :3
## 3rd Qu.:-47.00 3rd Qu.:1.778 3rd Qu.:1.913 3rd Qu.:2 3rd Qu.:3
## Max.   :-44.00 Max.   :1.995 Max.   :7.614 Max.   :2 Max.   :3
##                                     NA's   :799
```

```
apply(dat,2,sd)
```

```
##      Rep      RSSI Distance      d      trial
## 0.2441282 0.2142756      NA 0.0000000 0.0000000
```

```
d <- 3
```

```
trial <- 4
```

```
dat <- read_csv("./AidanData/3m/Trial4.txt", col_names=FALSE) %>%
  select(X6, X14, X16) %>%
  rename(Rep = X6, RSSI = X14, Distance = X16) %>%
  mutate(d = d, trial = trial)
```

```
## Rows: 1000 Columns: 22
```

```
## -- Column specification -----
## Delimiter: ", "
## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21
## dbl (10): X4, X6, X8, X10, X12, X14, X16, X18, X20, X22
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
summary(dat)
```

```
##      Rep      RSSI      Distance      d      trial
## Min.   : 1.0 Min.   :-54.50 Min.   :1.778 Min.   :3 Min.   :4
## 1st Qu.:250.8 1st Qu.:-51.50 1st Qu.:2.371 1st Qu.:3 1st Qu.:4
## Median :500.5 Median :-50.00 Median :2.818 Median :3 Median :4
## Mean   :500.5 Mean   :-50.07 Mean   :2.922 Mean   :3 Mean   :4
## 3rd Qu.:750.2 3rd Qu.:-48.50 3rd Qu.:3.350 3rd Qu.:3 3rd Qu.:4
## Max.   :1000.0 Max.   :-46.00 Max.   :4.732 Max.   :3 Max.   :4
```

```
apply(dat,2,sd)
```

```
##      Rep      RSSI Distance      d      trial
## 288.8194361 2.0733245 0.6925974 0.0000000 0.0000000
```

We work on the file names.

```

d <- 2
trial <- 7
(fn <- paste0("./AidanData/",d,"m/Trial",trial,".txt"))

## [1] "./AidanData/2m/Trial7.txt"

for (d in 1:3){
  for (trial in 1:10){
    fn <- paste0("./AidanData/",d,"m/Trial",trial,".txt")
    print(fn)
  }
}

## [1] "./AidanData/1m/Trial1.txt"
## [1] "./AidanData/1m/Trial2.txt"
## [1] "./AidanData/1m/Trial3.txt"
## [1] "./AidanData/1m/Trial4.txt"
## [1] "./AidanData/1m/Trial5.txt"
## [1] "./AidanData/1m/Trial6.txt"
## [1] "./AidanData/1m/Trial7.txt"
## [1] "./AidanData/1m/Trial8.txt"
## [1] "./AidanData/1m/Trial9.txt"
## [1] "./AidanData/1m/Trial10.txt"
## [1] "./AidanData/2m/Trial1.txt"
## [1] "./AidanData/2m/Trial2.txt"
## [1] "./AidanData/2m/Trial3.txt"
## [1] "./AidanData/2m/Trial4.txt"
## [1] "./AidanData/2m/Trial5.txt"
## [1] "./AidanData/2m/Trial6.txt"
## [1] "./AidanData/2m/Trial7.txt"
## [1] "./AidanData/2m/Trial8.txt"
## [1] "./AidanData/2m/Trial9.txt"
## [1] "./AidanData/2m/Trial10.txt"
## [1] "./AidanData/3m/Trial1.txt"
## [1] "./AidanData/3m/Trial2.txt"
## [1] "./AidanData/3m/Trial3.txt"
## [1] "./AidanData/3m/Trial4.txt"
## [1] "./AidanData/3m/Trial5.txt"
## [1] "./AidanData/3m/Trial6.txt"
## [1] "./AidanData/3m/Trial7.txt"
## [1] "./AidanData/3m/Trial8.txt"
## [1] "./AidanData/3m/Trial9.txt"
## [1] "./AidanData/3m/Trial10.txt"

```

Now, make the tibble creation a function and merge all the inputted files.

```

read_trial_file <- function(d, trial){
  fn <- paste0("./AidanData/",d,"m/Trial",trial,".txt")
  if (d == 2){
    dat <- read_csv(file=fn, col_names=FALSE) %>%
      select(X4, X12, X14) %>%
      rename(Rep = X4, RSSI = X12, Distance = X14) %>%
      mutate(d = d, trial = trial)
  }else{
    dat <- read_csv(file=fn, col_names=FALSE) %>%

```

```

    select(X6, X14, X16) %>%
    rename(Rep = X6, RSSI = X14, Distance = X16) %>%
    mutate(d = d, trial = trial)
  }
  return(dat)
}

```

Check it

```

d <- 3
trial <- 5
dat <- read_trial_file(d, trial)

```

```

## Rows: 1000 Columns: 22
## -- Column specification -----
## Delimiter: ","
## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21
## dbl (10): X4, X6, X8, X10, X12, X14, X16, X18, X20, X22
##
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```

```
head(dat)
```

```

## # A tibble: 6 x 5
##   Rep  RSSI Distance    d trial
##   <dbl> <dbl>   <dbl> <dbl> <dbl>
## 1     1   -51     3.16     3     5
## 2     2   -51     3.16     3     5
## 3     3  -49.5     2.66     3     5
## 4     4  -49.5     2.66     3     5
## 5     5  -49.5     2.66     3     5
## 6     6  -49.5     2.66     3     5

```

Now read it all.

```

### Read them all
prt <- FALSE
for (d in 1:3){
  for (trial in 1:10){
    if (d==1 & trial==1){
      dat <- read_trial_file(1, 1)
      if (prt) {
        print(summary(dat))
      }
    }else{
      tmp <- read_trial_file(d, trial)
      if (prt){
        print(summary(tmp))
      }
      dat <- rbind(dat, tmp)
    }
  }
}

```

```

## Rows: 1000 Columns: 22
## -- Column specification -----

```

```
## Delimiter: ","
## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21
## dbf (10): X4, X6, X8, X10, X12, X14, X16, X18, X20, X22
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## Rows: 1000 Columns: 22
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## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21
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## i Use `spec()` to retrieve the full column specification for this data.
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## Rows: 1000 Columns: 20
## -- Column specification -----
## Delimiter: ","
## chr (11): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19
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##
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##
##

```

```

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## chr (11): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19
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## i Use `spec()` to retrieve the full column specification for this data.
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## Rows: 1000 Columns: 22
## -- Column specification -----
## Delimiter: ","
## chr (12): X1, X2, X3, X5, X7, X9, X11, X13, X15, X17, X19, X21

```

```

## dbl (10): X4, X6, X8, X10, X12, X14, X16, X18, X20, X22
##
## i Use `spec()` to retrieve the full column specification for this data.
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```



```

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```

```
dim(dat)
```

```
## [1] 30000      5
```

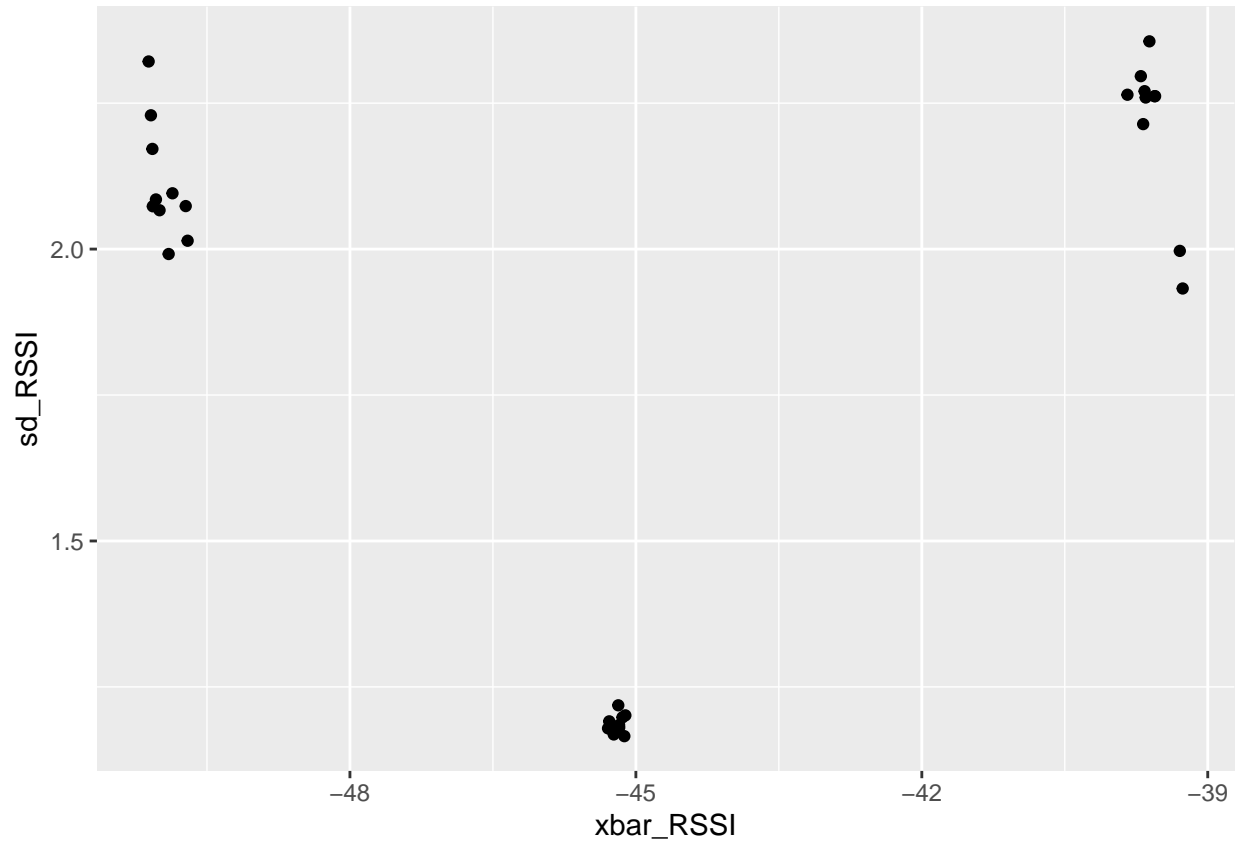
Look at what's in it.

```
dat %>% group_by(d) %>%
  summarize(xbar_RSSI = mean(RSSI), sd_RSSI = sd(RSSI), xbar_dist = mean(Distance), sd_dist = s
```

```
## # A tibble: 3 x 5
##       d xbar_RSSI sd_RSSI xbar_dist sd_dist
##   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1     1     -39.6     2.22     0.983   0.232
## 2     2     -45.2     1.19     1.64    0.215
## 3     3     -50.0     2.12     2.89    0.713
```

```
dat %>% group_by(d, trial) %>%
  summarize(xbar_RSSI = mean(RSSI), sd_RSSI = sd(RSSI), xbar_dist = mean(Distance), sd_dist = s
  ggplot(aes(x=xbar_RSSI, y=sd_RSSI)) + geom_point()
```

```
## `summarise()` has grouped output by 'd'. You can override using the `.groups`
## argument.
```



```
dat %>% ggplot(aes(x=factor(d), y=Distance)) + geom_violin(fill="cyan") + geom_boxplot(width=0.02)
```

