

Presentation

```
dta <- scan("resources\\wave_ampl.txt", sep = ",")
cluster <- split(dta, ceiling(seq_along(dta)/1024))

preffered_cluster <- unlist(cluster[75])
filtered_cluster <- runmed(preffered_cluster, k = 3)
k <- 30
breaks <- seq(min(filtered_cluster), max(filtered_cluster), l = k + 1)
h <- hist(filtered_cluster, breaks = breaks, plot = F)
max_ind <- which.max(h$counts)
second_max_ind <- which(h$counts == max(h$counts[-max_ind]))
point_type <- vector(mode = "character", length = 1024)
first_noise_band <- c()
second_noise_band <- c()
signal <- c()
first_conversion <- c()
second_conversion <- c()
for (i in 1:1024) {
  if (breaks[max_ind] <= filtered_cluster[i] & filtered_cluster[i] <= breaks[max_ind +
    1]) {
    point_type[i] <- "Noise"
    if (is.null(first_conversion)) {
      first_noise_band <- c(first_noise_band, filtered_cluster[i])
    } else {
      second_noise_band <- c(second_noise_band, filtered_cluster[i])
    }
  } else if (breaks[second_max_ind] <= filtered_cluster[i] & filtered_cluster[i] <=
    breaks[second_max_ind + 1]) {
    point_type[i] <- "Signal"
    signal <- c(signal, filtered_cluster[i])
  } else {
    point_type[i] <- "Conversion"
    if (is.null(signal)) {
      first_conversion <- c(first_conversion, filtered_cluster[i])
    } else {
      second_conversion <- c(second_conversion, filtered_cluster[i])
    }
  }
}

colored_cluster <- data.frame(ptime = 1:1024, pdta = filtered_cluster, ptypes = point_type)
col_pic <- ggplot(colored_cluster, aes(x = ptime, y = pdta)) + geom_point(size = 0.9,
  aes(color = ptypes)) + labs(color = "Type", x = "Time", y = "Value")
pic <- ggplot(data.frame(preffered_cluster), aes(x = 1:1024, y = preffered_cluster)) +
  geom_point(size = 0.1) + labs(x = "Time", y = "Value")
smoothed_pic <- ggplot(data.frame(filtered_cluster), aes(x = 1:1024, y = filtered_cluster)) +
  geom_point(size = 0.1) + labs(x = "Time", y = "Value")
ggsave("resources\\wave_pic.pdf", pic, device = "pdf", width = 9)
```

```
## Saving 9 x 4.5 in image
```

```
ggsave("resources\\wave_smoothed_pic.pdf", smoothed_pic, device = "pdf", width = 9)
```

```
## Saving 9 x 4.5 in image
```

```
ggsave("resources\\wave_colored_pic.pdf", col_pic, device = "pdf", width = 9)
```

```
## Saving 9 x 4.5 in image
```

```
pdf("resources\\wave_hist.pdf")
```

```
hist_pic <- hist(filtered_cluster, breaks = breaks, plot = F)
```

```
hist_pic$density <- hist_pic$counts/sum(hist_pic$counts)
```

```
plot(hist_pic, freq = F, col = "palegreen2", xlab = "Value", ylab = "Density", main = "")
```

```
grid(col = "grey60")
```

```
dumy_val <- dev.off()
```

```
band <- list(first_noise_band, first_conversion, signal, second_conversion, second_noise_band)
```

```
partition <- c(8, 8, 8, 8, 8)
```

```
subcluster_type <- list("<d2><e8><ef>", "<d4><ee><ed>", "<cf><e5><f0><e5><f5><ee><e4>",  
  "<d1><e8><e3><ed><e0><eb>", "<cf><e5><f0><e5><f5><ee><e4>", "<d4><ee><ed>")
```

```
f_test <- vector(mode = "numeric", length = length(band))
```

```
for (i in 1:length(band)) {
```

```
  defining_seq <- seq_along(band[[i]])
```

```
  defining_seq <- cut(defining_seq, partition[i], labels = F)
```

```
  sub_band_size <- vector(mode = "numeric", length = length(partition[i]))
```

```
  for (j in 1:max(defining_seq)) {
```

```
    sub_band_size[j] <- length(which(defining_seq == j))
```

```
  }
```

```
  sub_band <- split(band[[i]], cut(defining_seq, partition[i], labels = F))
```

```
  si_2 <- unlist(foreach(k = 1:length(sub_band)) %do% var(sub_band[[k]]))
```

```
  si_intaG_2 <- mean(si_2)
```

```
  mean_vect <- unlist(foreach(l = 1:length(sub_band)) %do% mean(sub_band[[l]]))
```

```
  mean_vect <- (mean_vect - mean(mean_vect))^2 * sub_band_size
```

```
  si_inteG_2 <- sum(mean_vect)/sum(sub_band_size)
```

```
  f_test[i] <- si_inteG_2/si_intaG_2
```

```
}
```

```
band_num <- append(as.list(1:length(f_test)), "<cf><f0><ee><ec><e5><e6><f3><f2><ee><ea>",  
  after = 0)
```

```
f_test <- round(f_test, digits = 2)
```

```
f_test <- foreach(m = 1:length(f_test)) %do% paste(toString(f_test[m]), "\\hline ")
```

```
f_test <- append(f_test, "<ca><f0><e8><f2><e5><f0><e8><e9> <d4><e8><f8><e5><f0><e0>\\hline ",  
  after = 0)
```

```
col_names <- c("<cf><f0><ee><ec><e5><e6><f3><f2><ee><ea>", "<d2><e8><ef>", "<ca><ee><eb><e8><f7><e5><f1> ",  
  "<ca><f0><e8><f2><e5><f0><e8><e9> <d4><e8><f8><e5><f0><e0>\\hline ")
```

```
partition <- append(as.list(partition), "<ca><ee><eb><e8><f7><e5><f1><f2><e2><ee> <f0><e0><e7><e1><e8><e9> ",  
  after = 0)
```

```
content <- cbind(band_num, subcluster_type, partition, f_test)
```

```
write.table(content, file = "resources\\wave_f_test.tex", sep = "&", col.names = F,  
  row.names = F, fileEncoding = "UTF-8")
```