

# Presentation

```
x_cont_segment <- seq(-4, 4, length.out = 500)
x_discr_segment <- seq(6, 14, length.out = 9)
y_pdf_norm <- dnorm(x_cont_segment)
y_pdf_cauchy <- dcauchy(x_cont_segment)
y_pdf_unif <- dunif(x_cont_segment, min = -sqrt(3), max = sqrt(3))
y_pdf_laplace <- dlaplace(x_cont_segment, m = 0, s = 1/sqrt(2))
y_pmf_poisson <- dpois(x_discr_segment, lambda = 10)
limits <- list(c(-4, 4), c(-4, 4), c(-4, 4), c(6, 14), c(-4, 4))
adjust_coef <- c(0.5, 1, 2)
pval <- list(y_pdf_norm, y_pdf_cauchy, y_pdf_laplace, y_pmf_poisson, y_pdf_unif)
pdom <- list(x_cont_segment, x_cont_segment, x_cont_segment, x_discr_segment, x_cont_segment)
dist_summary <- replicate(15, list())
for (k in 1:1000) {
  dist <- replicate(5, list())
  norm_sample <- rnorm(100)
  pois_sample <- rpois(100, 10)
  cauchy_sample <- rcauchy(100)
  unif_sample <- runif(100, min = -sqrt(3), max = sqrt(3))
  laplace_sample = rlaplace(100, m = 0, s = 1/sqrt(2))
  dsamp <- list(norm_sample, cauchy_sample, laplace_sample, pois_sample, unif_sample)
  for (i in 1:length(adjust_coef)) {
    for (j in 1:length(dsamp)) {
      kde <- density(dsamp[[j]], bw = "nrd", adjust = adjust_coef[i], n = 500,
        from = limits[[j]][1], to = limits[[j]][2])
      dist[[j]][i] <- distFrechet(pdom[[j]], pval[[j]], kde$x, kde$y, FrechetSumOrMax = "max")
    }
  }
  dist <- do.call(c, dist)
  for (l in 1:length(dist)) {
    dist_summary[[l]][k] <- dist[l]
  }
}
for (l in 1:length(dist_summary)) {
  dist_summary[[l]] <- mean(unlist(dist_summary[[l]]))
}
norm_names <- c("Norm, $h=h_{100}/2$", "Norm, $h=h_{100}$", "Norm, $h=2h_{100}$")
cauchy_names <- c("Cauchy, $h=h_{100}/2$", "Cauchy, $h=h_{100}$", "Cauchy, $h=2h_{100}$")
laplace_names <- c("Laplace, $h=h_{100}/2$", "Laplace, $h=h_{100}$", "Laplace, $h=2h_{100}$")
poisson_names <- c("Poisson, $h=h_{100}/2$", "Poisson, $h=h_{100}$", "Poisson, $h=2h_{100}$")
unif_names <- c("Uniform, $h=h_{100}/2$", "Uniform, $h=h_{100}$", "Uniform, $h=2h_{100}$")
names <- c(norm_names, cauchy_names, laplace_names, poisson_names, unif_names)
df <- data.frame(names, unlist(dist_summary))
col_names <- c("Distribution, $n$ = 100", "$\\widehat{\\delta}_{dF}$")
file_name <- "frechetTests.pdf"
knitr::kable(df, format = "latex", col.names = col_names, align = c("l", "c"), escape = F) %>%
  column_spec(1, border_left = T) %>% column_spec(2, border_right = T) %>% save_kable(file_name)
```