

# Relatorio

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## Carregar arquivo de dados

```
# Cargamos el fichero de datos
# Debe tener una estructura igual a este, es decir,
# que las coordenadas X e Y estan en las columnas 3 y 5
# (la X) y 4 y 6 (la Y)
# Nombre del fichero de datos
fichero <- "Estatistica_8PCT.csv"
dados <- read.csv(fichero, header=TRUE, sep=";", dec=",")
dados[,2] <- 0
```

## Calcular os erros em X e Y

```
puncontrol <- list()
for (i in 1:100) {
  x <- (i-1)*35+1
  puncontrol[[i]] <- dados[x:(x+33), ]
  # Calculamos los errores en X e Y
  puncontrol[[i]]$E_X <- puncontrol[[i]][,5] - puncontrol[[i]][,3]
  puncontrol[[i]]$E_Y <- puncontrol[[i]][,6] - puncontrol[[i]][,4]
}
```

## Estatísticas Básicas

```
basicStats(puncontrol[[params$j]]$E_X)
```

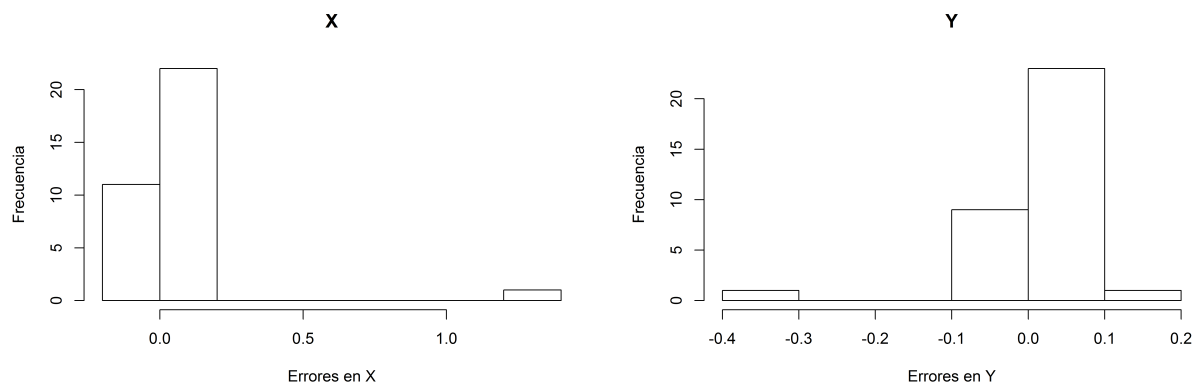
```
##           X..puncontrol..params.j...E_X
## nobs                      34.000000
## NAs                       0.000000
## Minimum                   -0.171500
## Maximum                    1.311000
## 1. Quartile                -0.006400
## 3. Quartile                 0.022400
## Mean                      0.040494
## Median                     0.011650
## Sum                        1.376800
## SE Mean                    0.039003
## LCL Mean                   -0.038858
## UCL Mean                    0.119847
## Variance                   0.051722
## Stdev                      0.227425
```

```
## Skewness          5.097680
## Kurtosis          25.670418
```

```
basicStats(puncontrol[[params$j]]$E_Y)
```

```
##           X..puncontrol..params.j...E_Y
## nobs          34.000000
## NAs            0.000000
## Minimum       -0.386000
## Maximum        0.160000
## 1. Quartile   -0.001750
## 3. Quartile    0.045750
## Mean          0.012735
## Median        0.022500
## Sum           0.433000
## SE Mean       0.013621
## LCL Mean      -0.014977
## UCL Mean       0.040447
## Variance      0.006308
## Stdev         0.079423
## Skewness      -3.514139
## Kurtosis      16.062416
```

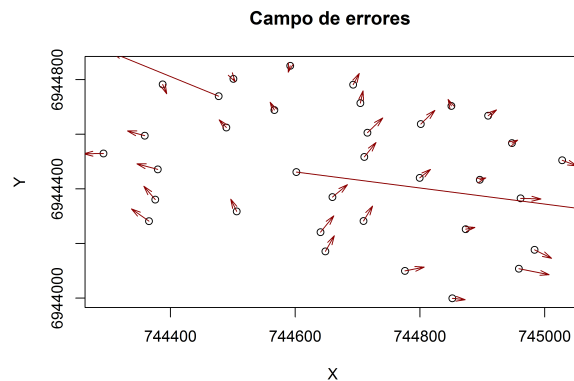
```
hist(puncontrol[[params$j]]$E_X, main="X", xlab="Errores en X", ylab="Frecuencia")
hist(puncontrol[[params$j]]$E_Y, main="Y", xlab="Errores en Y", ylab="Frecuencia")
```



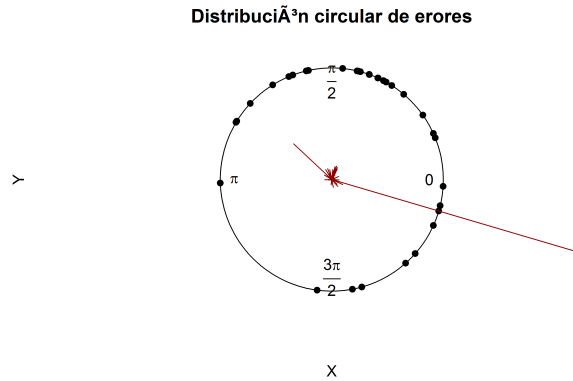
```
plot(puncontrol[[params$j]][,3], puncontrol[[params$j]][,4] ,
     main="Distribuci³n espacial de los puntos de evaluaci³n",
     xlab="X", ylab="Y")
```



```
# Cambia este factor según necesites
fescala <- 1000
plot(puncontrol[[params$j]][,3], puncontrol[[params$j]][,4],
     main="Campo de errores ", xlab="X", ylab="Y")
arrows(puncontrol[[params$j]][,3],
       puncontrol[[params$j]][,4],
       puncontrol[[params$j]][,3] + fescala*puncontrol[[params$j]]$E_X,
       puncontrol[[params$j]][,4] + fescala* puncontrol[[params$j]]$E_Y,
       col= 'dark red', length = 0.1, angle = 15)
```



```
# Cambia el factor de escala circular según necesites
fescalaCir <- 2
datos_cir2d <- circular(atan2(puncontrol[[params$j]]$E_Y, puncontrol[[params$j]]$E_X))
modulo2d <- sqrt(puncontrol[[params$j]]$E_X^2+puncontrol[[params$j]]$E_Y^2)
plot.circular(datos_cir2d)
title(main="Distribución circular de errores", xlab="X", ylab="Y")
segments(0, 0,
        fescalaCir*puncontrol[[params$j]]$E_X,
        fescalaCir* puncontrol[[params$j]]$E_Y,
        col= 'dark red')
```

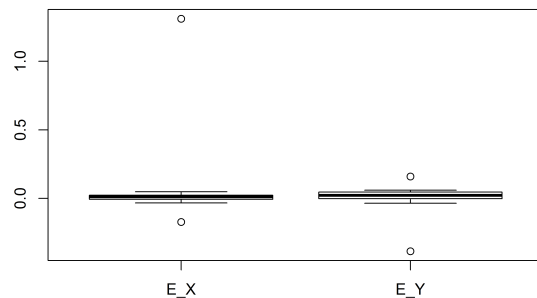


```
QCoH_RANDOMNESS(puncontrol[[params$j]][c(7,8)])
```

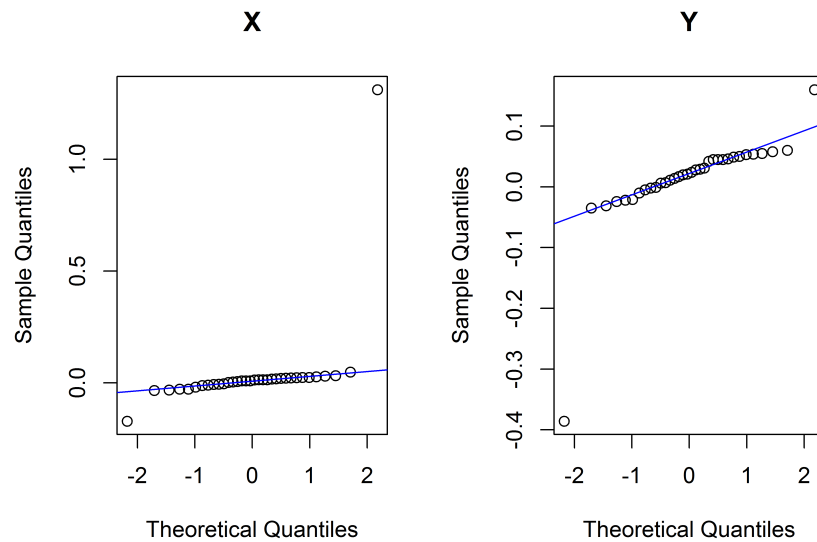
```
## [1] "El resultado del test de aleatoriedad para X: "
##
## Runs Test
##
## data: errorespos[, 1]
## statistic = -3.1348, runs = 9, n1 = 17, n2 = 17, n = 34, p-value =
## 0.001719
## alternative hypothesis: nonrandomness
##
## [1] "El resultado del test de aleatoriedad para Y: "
##
## Runs Test
##
## data: errorespos[, 2]
## statistic = -3.1348, runs = 9, n1 = 17, n2 = 17, n = 34, p-value =
## 0.001719
## alternative hypothesis: nonrandomness
```

```
QCoH_OUTLIERS(puncontrol[[params$j]][c(7,8)])
```

```
## [1] "El número de casos fuera de rango en X es: 1"
## [1] "El número de casos fuera de rango en Y es: 0"
```



```
QCoH_NORMALITY_G(puncontrol[[params$j]][c(7,8)])
```



```
QCoH_NORMALITY_A_KS(puncontrol[[params$j]][c(7,8)])
```

```
## Warning in ks.test(x, "pnorm", alternative = "two.sided"): ties should not
## be present for the Kolmogorov-Smirnov test

## Warning in ks.test(x, "pnorm", alternative = "less"): ties should not be
## present for the Kolmogorov-Smirnov test

## Warning in ks.test(x, "pnorm", alternative = "greater"): ties should not be
## present for the Kolmogorov-Smirnov test

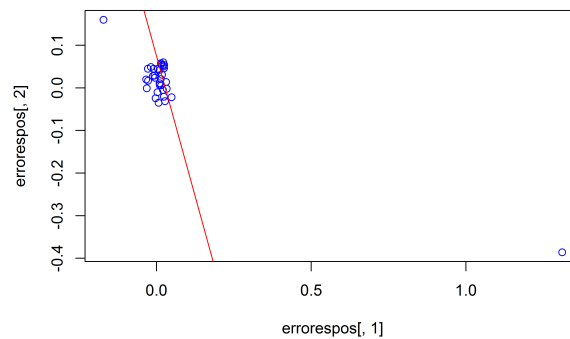
##
## Title:
## Normality test
##
## Test Results:
## STATISTIC:
## D: 0.4572
## P VALUE:
## Alternative Two-Sided: 5.103e-07
## Alternative Less: 2.552e-07
## Alternative Greater: 3.873e-07
##
## Description:
## X coordinate
##
## Title:
## Normality test
##
## Test Results:
## STATISTIC:
## D: 0.4566
## P VALUE:
## Alternative Two-Sided: 1.391e-06
## Alternative Less: 6.955e-07
```

```
## Alternative Greater: 1.282e-06
##
## Description:
## Y coordinate
```

```
QCoH_HOMOCEDAS_BAR(puncontrol[[params$j]][c(7,8)])
```

```
##
## Title:
## Bartlett Test for Homogeneity of Variances
##
## Test Results:
## STATISTIC:
## Bartlett's Chi-squared: 30.8149
## P VALUE:
## 2.838e-08
##
## Description:
## Thu Jul 18 14:48:38 2019
```

```
QCoH_CORRELATION_G(puncontrol[[params$j]][c(7,8)])
```



```
QCoH_CORRELATION_A(puncontrol[[params$j]][c(7,8)])
```

```
## E_X E_Y
## E_X 1.0000000 -0.9202357
## E_Y -0.9202357 1.0000000
```

```
QCoH_CORRELATION_A_SPR(puncontrol[[params$j]][c(7,8)])
```

```
## Warning in cor.test.default(errorespos[, 1], errorespos[, 2], method =
## "spearman"): Cannot compute exact p-value with ties
##
## Spearman's rank correlation rho
##
## data: errorespos[, 1] and errorespos[, 2]
## S = 7884.4, p-value = 0.2456
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
## rho
## -0.2046462
```