

# five\_mobile Experiment Report

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This is a summary of the data from the five\_mobile experiment.

Shown below is the summary of the error of all robots combined for both x and y coordinates, and also the error in total distance.

```
summary(continuous$x_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## -5.400e-02 -2.725e-03  1.436e-05  1.316e-04  3.812e-03  5.268e-02
```

```
summary(continuous$y_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## -5.154e-02 -2.362e-03 -1.390e-06  6.884e-04  3.920e-03  5.458e-02
```

```
summary(continuous$dist_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## 5.000e-08 4.189e-04 7.394e-03 1.366e-02 2.428e-02 5.746e-02
```

```
summary(discrete$x_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## -9.715000 -1.002000 -0.001486 -0.506600  0.105800  8.233000
```

```
summary(discrete$y_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## -7.528000 -0.696700 -0.001743 -0.452300  0.067510  3.991000
```

```
summary(discrete$dist_error)
```

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## 0.000000 0.03364 0.71880 2.10700 3.79000 10.64000
```

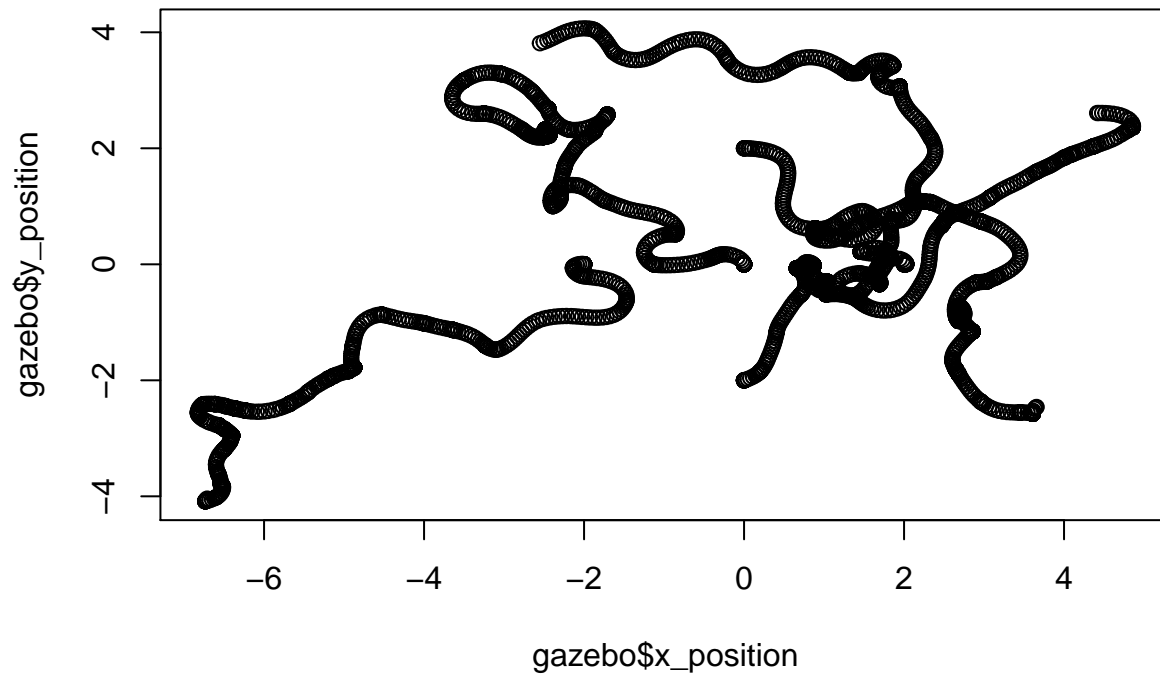
```
if (params$robot >= 2) {
  summary(external_data_averages)
}
```

```
##      Length Class  Mode
## [1,] 1      -none- numeric
## [2,] 1      -none- numeric
## [3,] 1      -none- numeric
## [4,] 1      -none- numeric
## [5,] 1      -none- numeric
```

Shown below are plots representing the robot's motion and error over time.

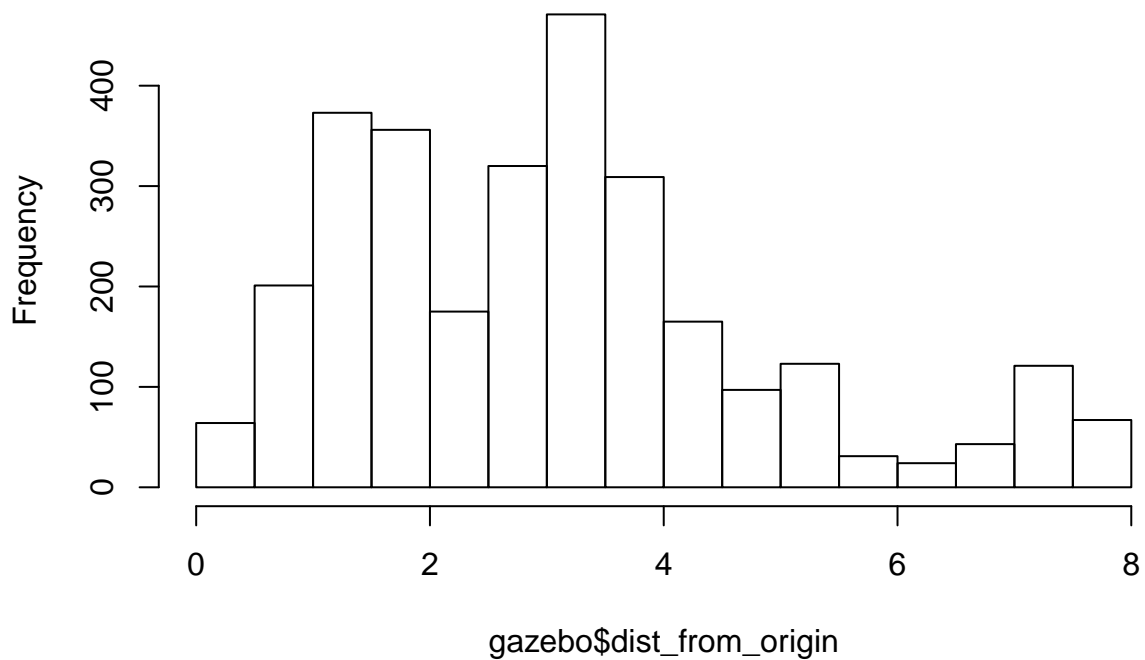
```
plot(gazebo$x_position, gazebo$y_position,
     main = "Ground truth visited locations of robots")
```

**Ground truth visited locations of robots**



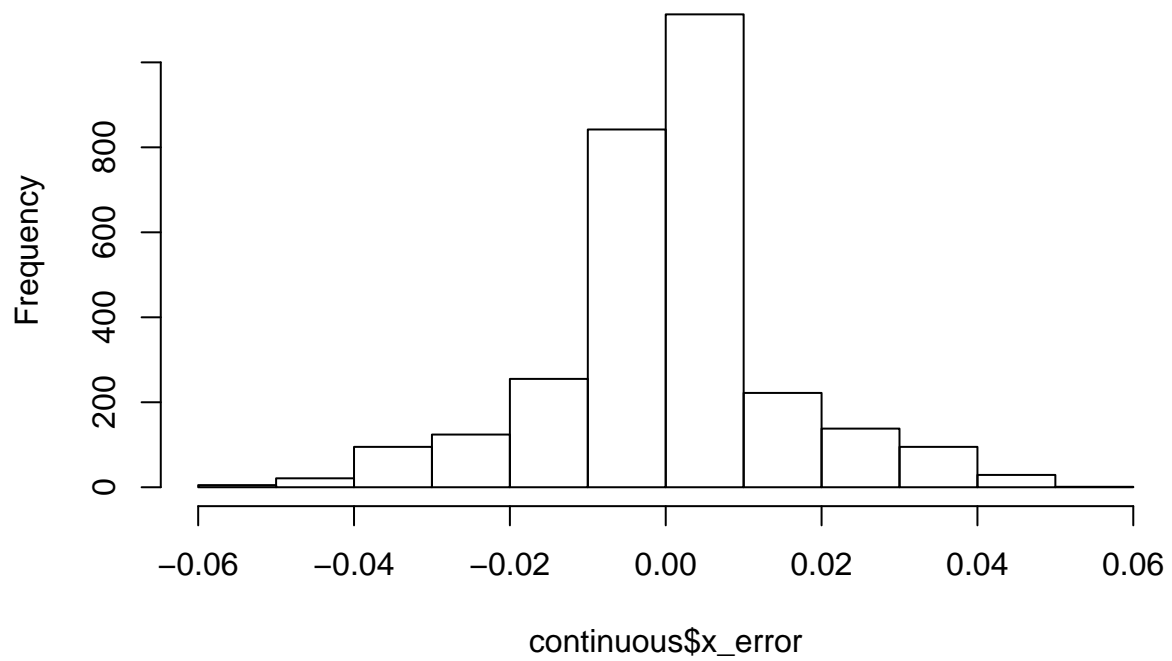
```
hist(gazebo$dist_from_origin,  
     main = "Distance from origin vs. time")
```

**Distance from origin vs. time**



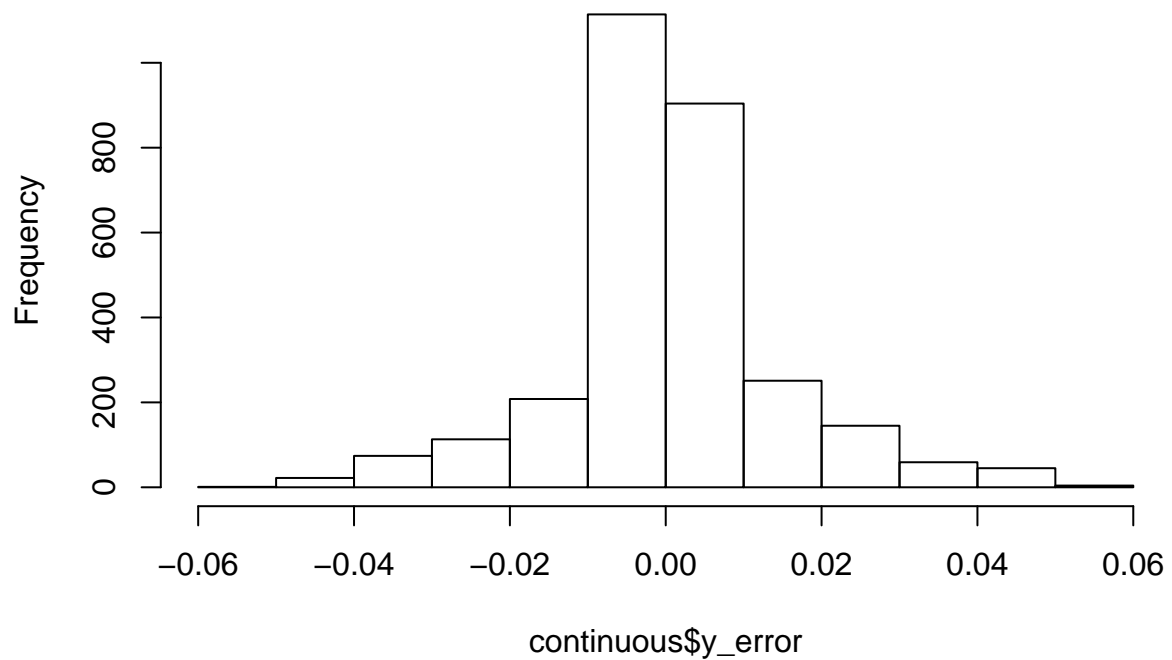
```
hist(continuous$x_error,  
     main = "Continuous x_error")
```

### Continuous x\_error



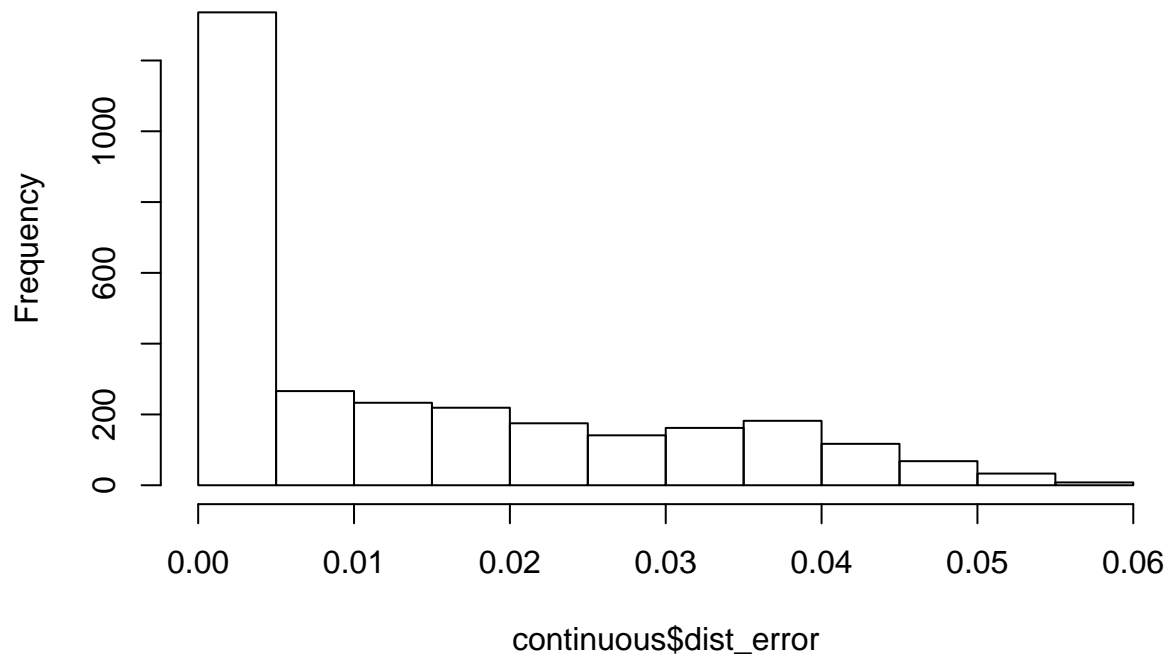
```
hist(continuous$y_error,  
     main = "Continuous y_error")
```

### Continuous y\_error



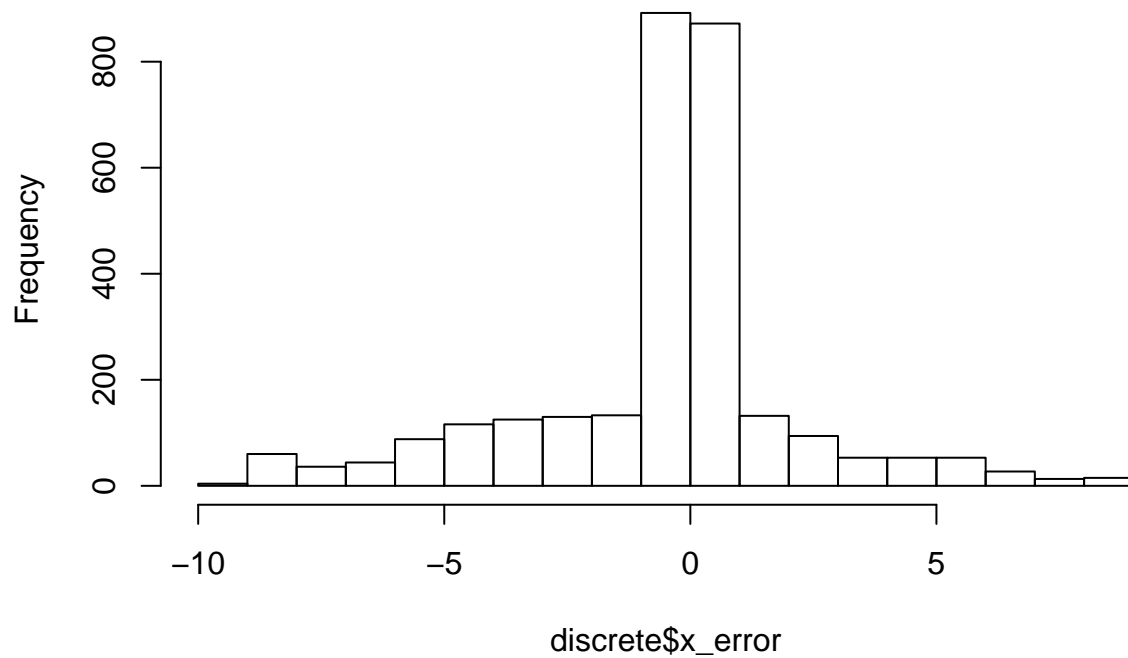
```
hist(continuous$dist_error,  
     main = "Continuous total distance error")
```

## Continuous total distance error



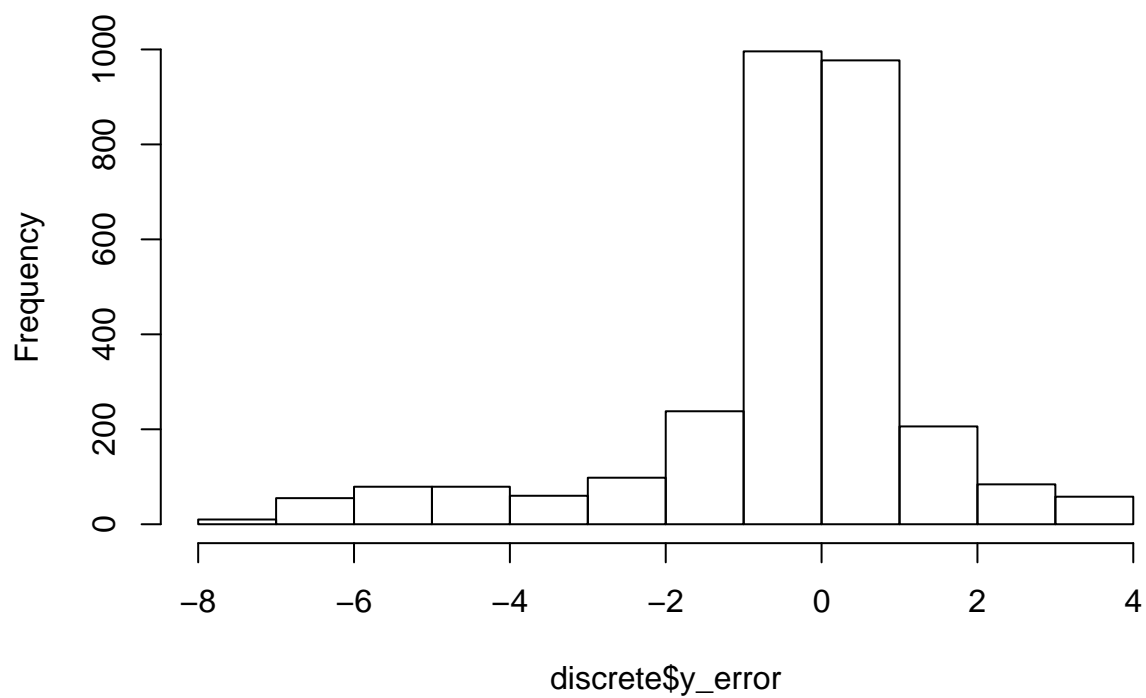
```
hist(discrete$x_error,  
     main = "Discrete x_error")
```

## Discrete x\_error



```
hist(discrete$y_error,  
     main = "Discrete y_error")
```

**Discrete y\_error**



```
hist (discrete$dist_error,  
      main = "Discrete total distance error")
```

**Discrete total distance error**

