

# five\_mobile\_restricted\_noisy\_true Turtlebot 5 Report

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This is a summary of the data from the five\_mobile\_restricted\_noisy\_true experiment, Turtlebot #5.

The runtime of this experiment was 1 hours, 8 minutes, and 18.1 seconds.

The total number of external pose measurements received by the robot during this time was 25787 which means poses were received at an average of 6.2924282 poses per second.

Shown below is the summary of each filter's error 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. 
## -6.878e-02 -4.664e-03 9.460e-06 5.626e-05 4.736e-03 6.672e-02
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -6.721e-02 -4.848e-03 -1.430e-05 3.872e-05 4.772e-03 6.292e-02
```

```
summary(continuous$yaw_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -6.283000 -0.112200 -0.006715 -0.000805 0.041420 6.280000
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.0000333 0.0046300 0.0079520 0.0128100 0.0178700 0.0742300
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -7.811000 -0.243600 -0.000152 -0.017100 0.040780 6.654000
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -9.961000 -0.117700  0.000003 -0.237200 0.134000 9.005000
```

```
summary(discrete$yaw_error)
```

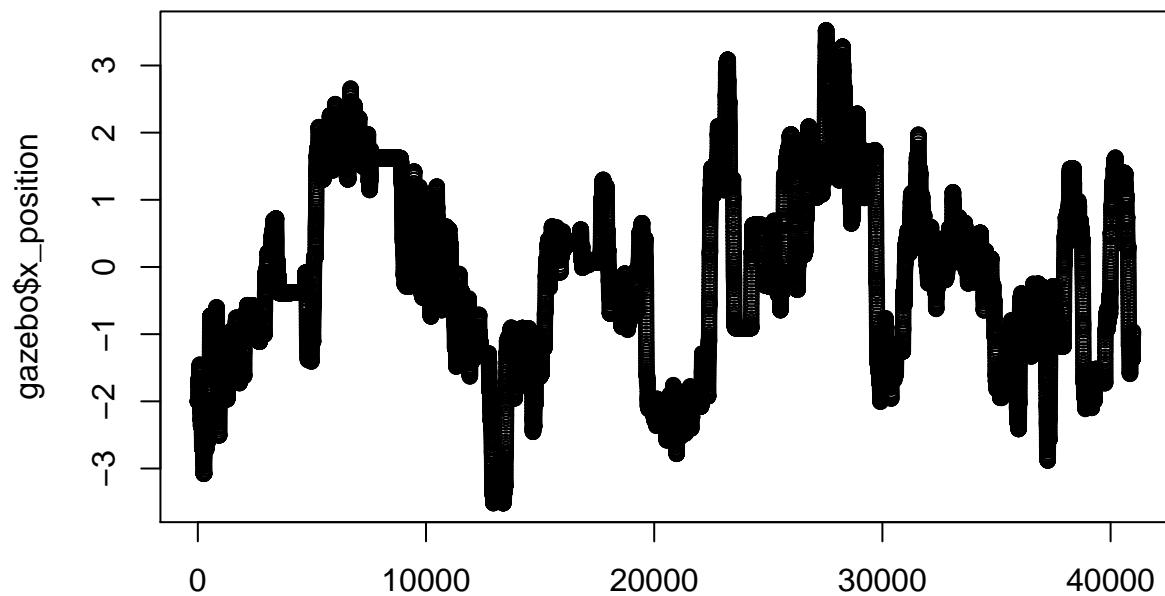
```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -6.283000 -0.216100 -0.002782 0.010870 0.007093 6.278000
```

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

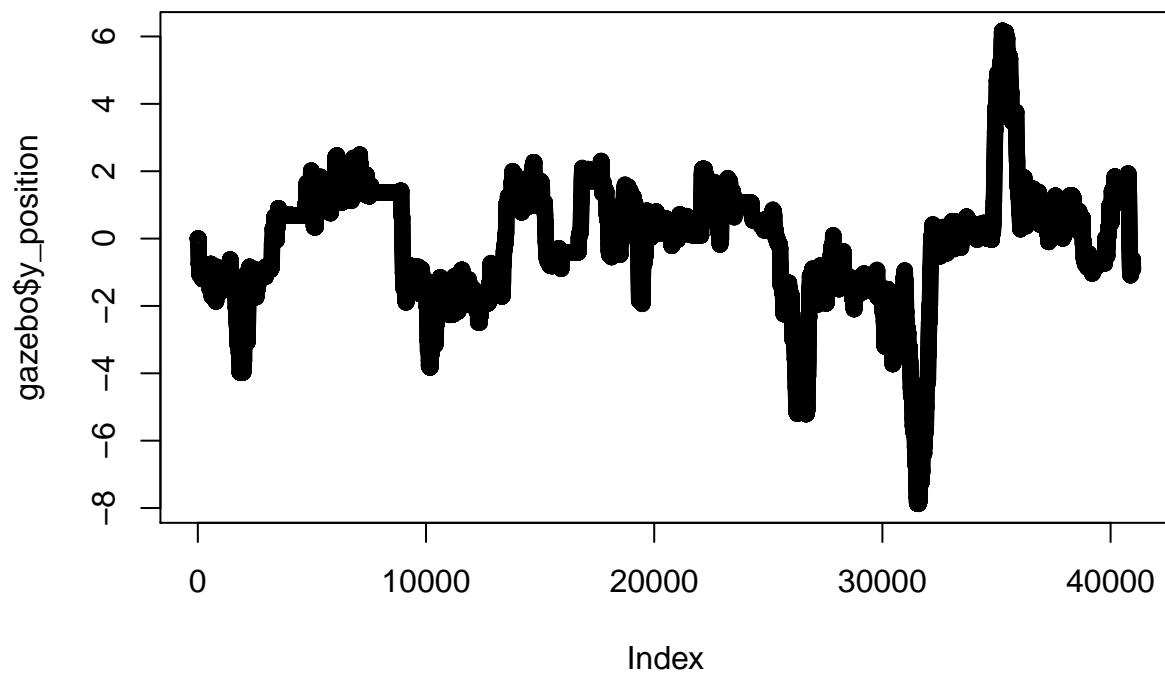
```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.0000000 0.006973 0.278700 1.204000 1.894000 10.400000
```

```
#sum(continuous$dist_error <= 0.25) / length(continuous$dist_error)
#sum(discrete$dist_error <= 0.25) / length(discrete$dist_error)
```

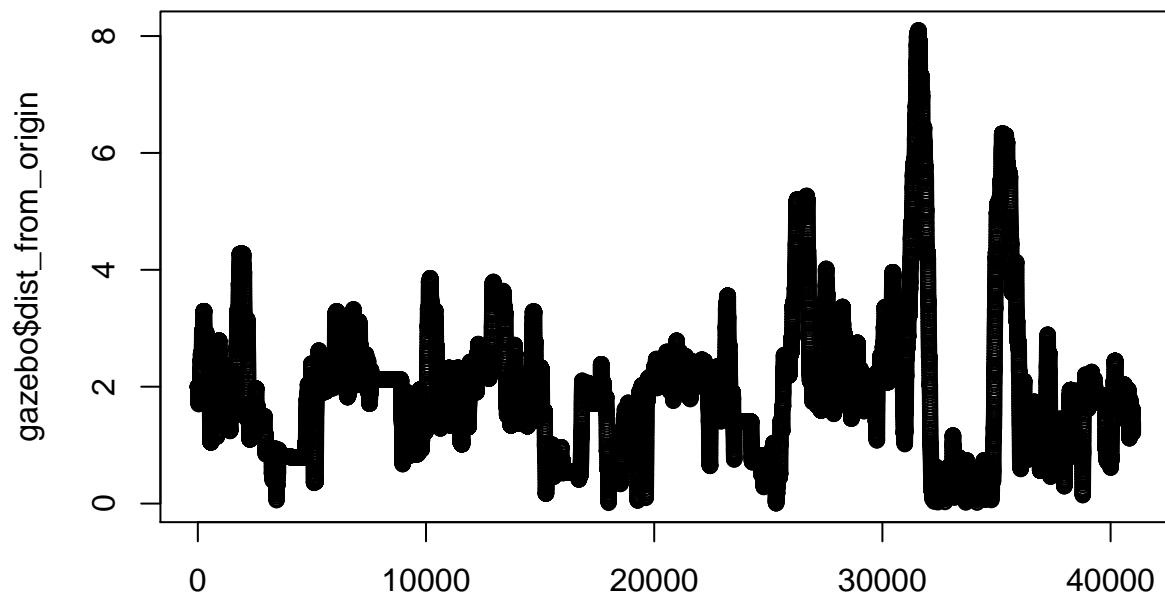
**X coordinate of robot over time**



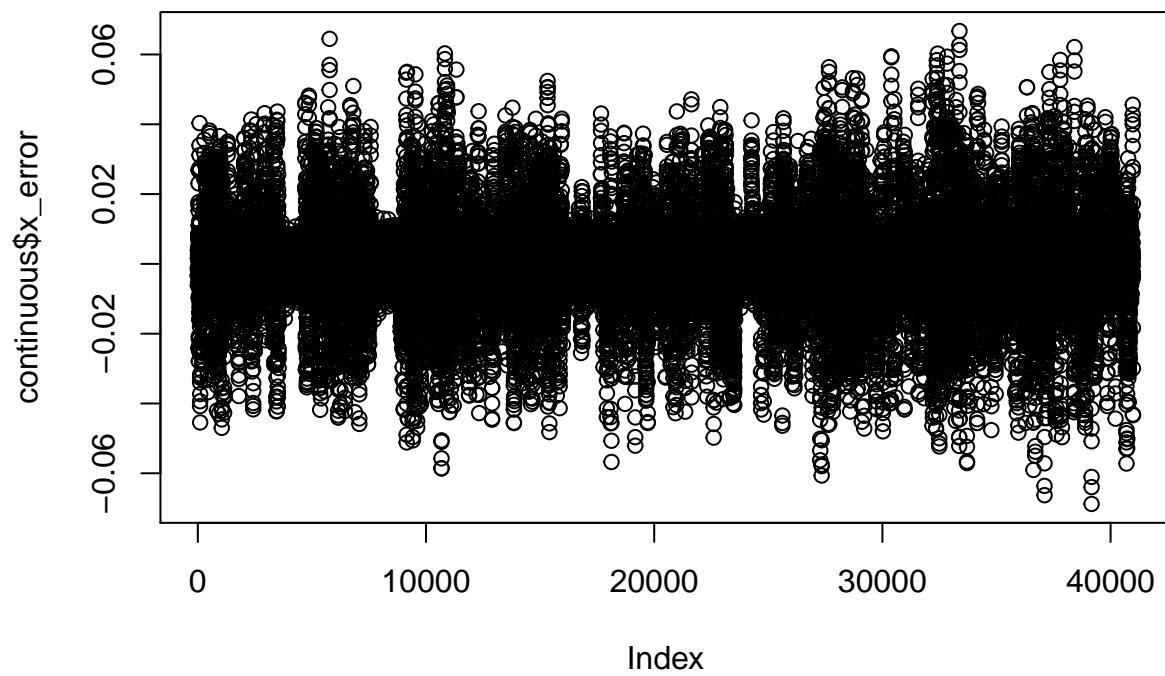
**Y coordinate of robot over time**



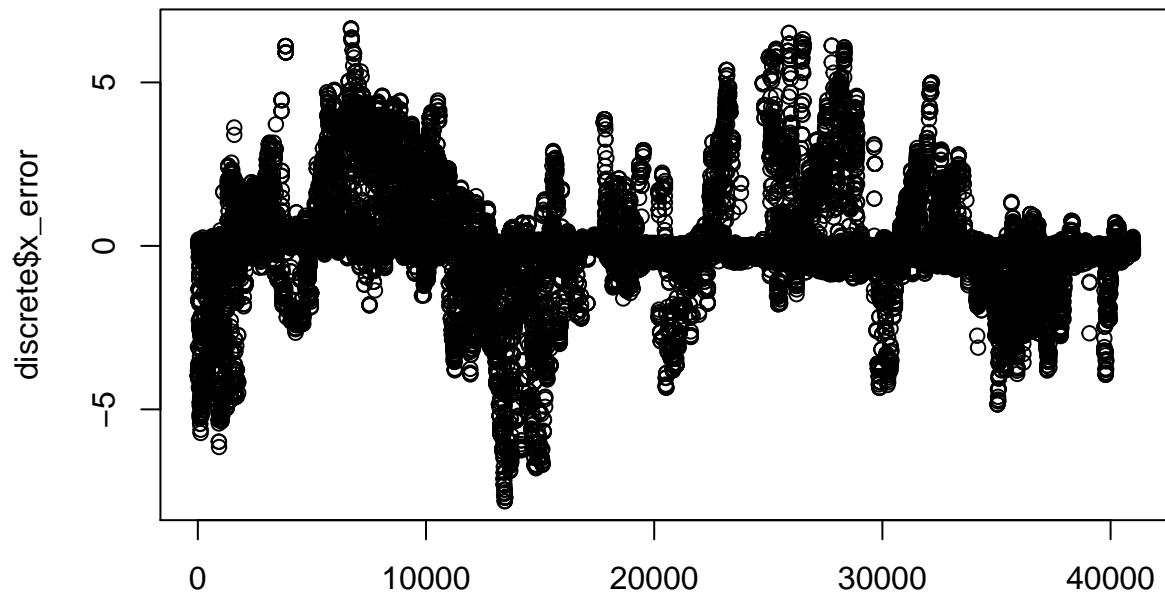
**Distance from origin vs. time**



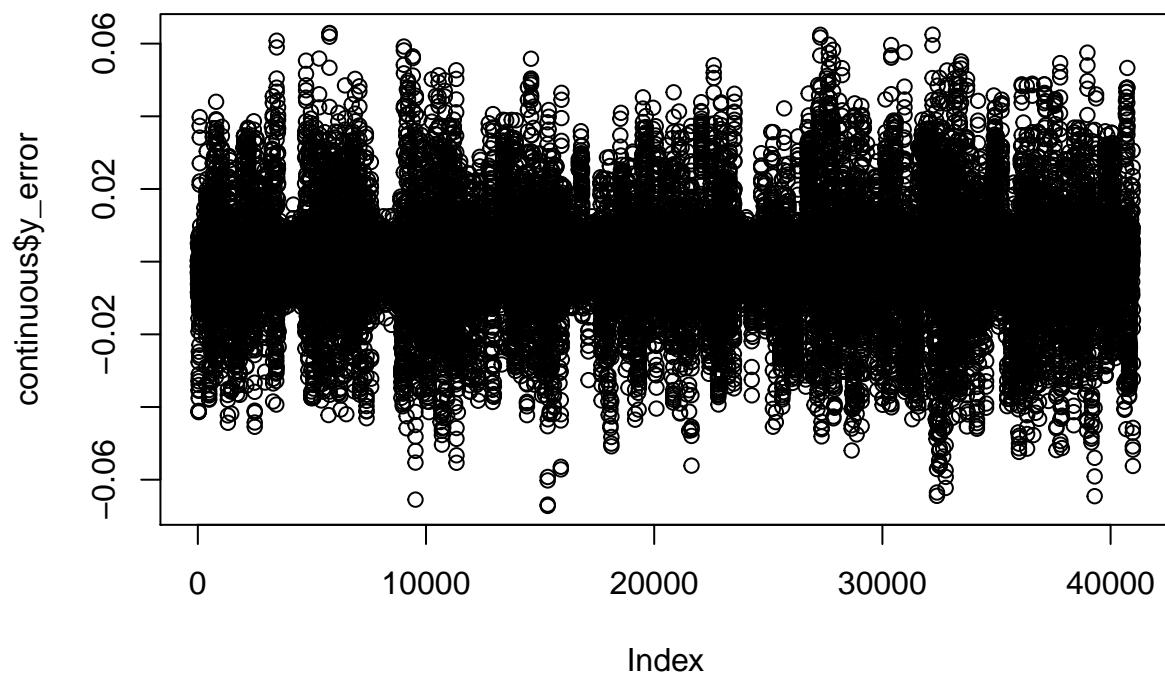
**Continuous x\_error over time**



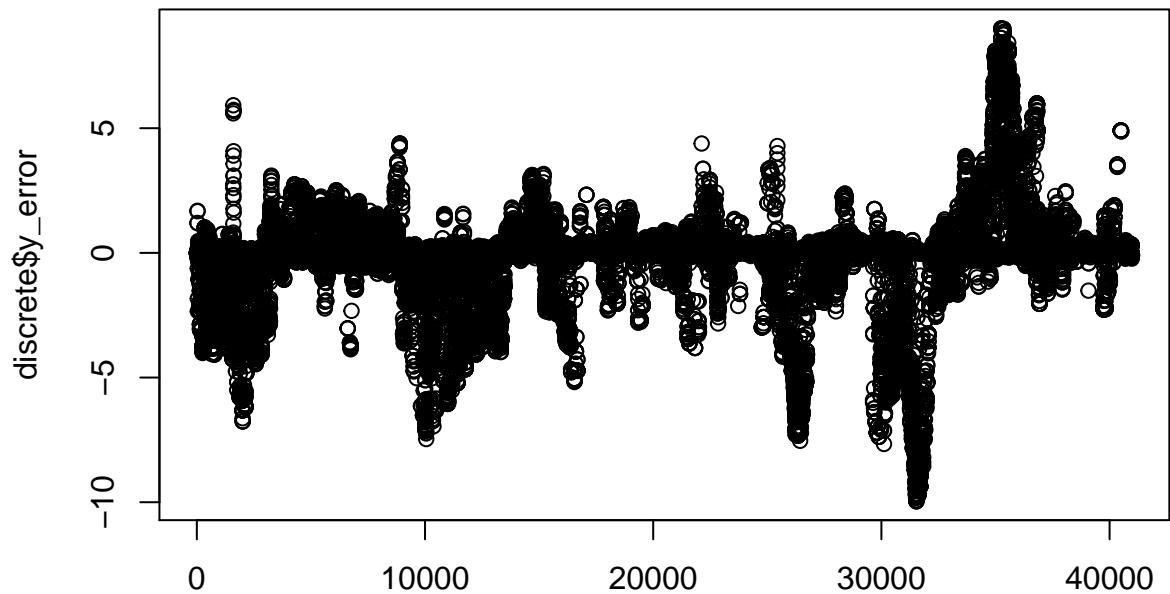
**Discrete x\_error over time**



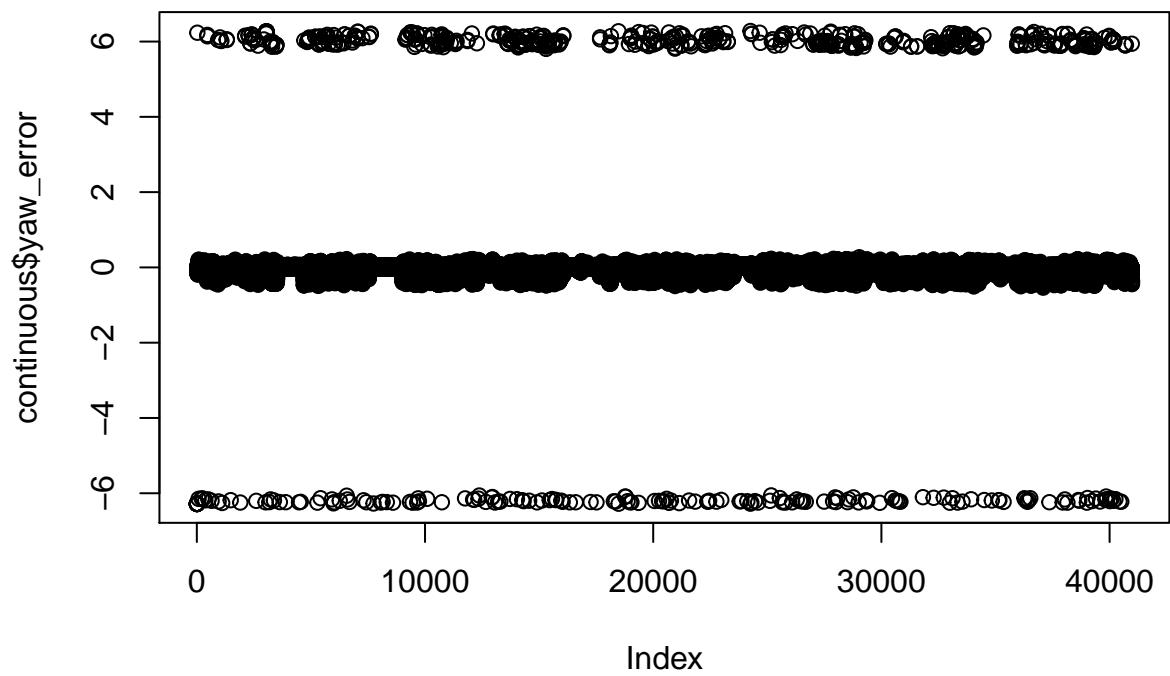
**Continuous y\_error over time**



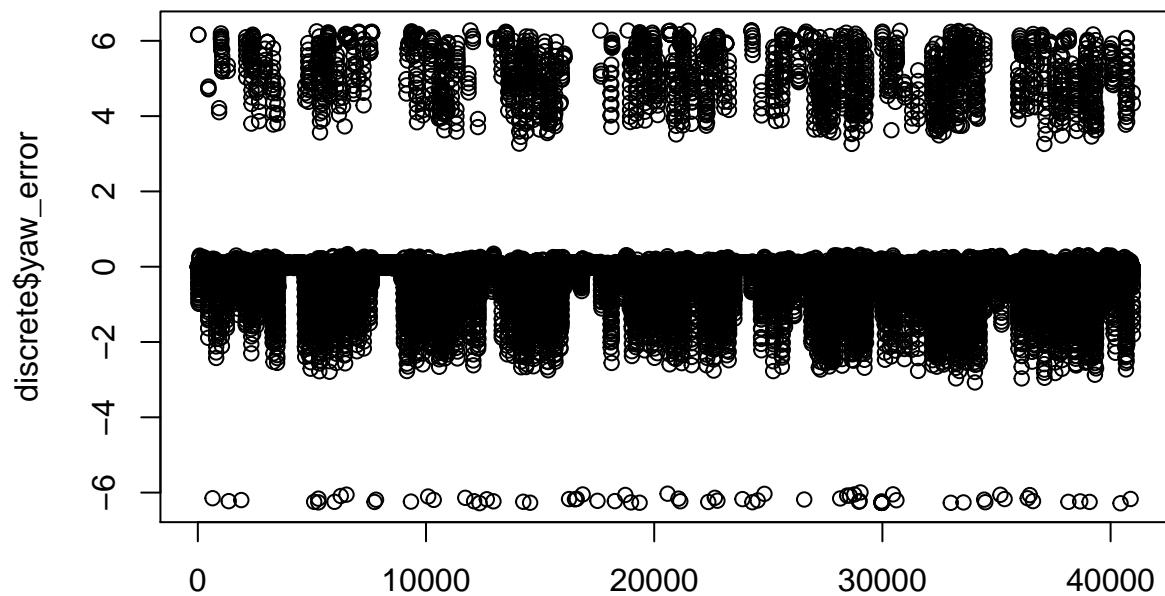
**Discrete y\_error over time**



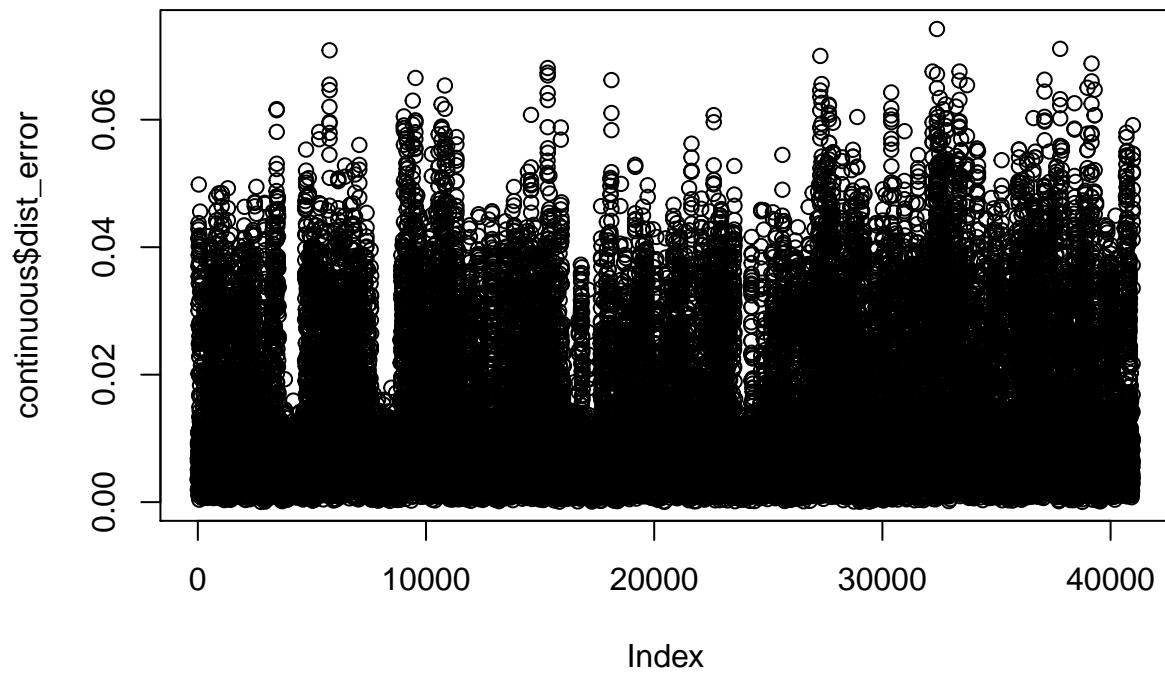
**Continuous yaw error over time**



**Discrete yaw error over time**



**Continuous total distance error over time**



### Discrete total distance error over time

