

five_mobile_noisy_true Turtlebot 4 Report

Matthew Swartwout

July 13, 2016

This is a summary of the data from the five_mobile_noisy_true experiment, Turtlebot #4.

The runtime of this experiment was 1 hours, 8 minutes, and 18.2 seconds.

The total number of external pose measurements received by the robot during this time was 16417 which means poses were received at an average of 4.005905 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. 
## -7.478e-02 -4.253e-03 -1.034e-04 -8.437e-05  4.055e-03  7.664e-02
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -7.881e-02 -4.091e-03  1.024e-05  6.143e-05  4.155e-03  7.855e-02
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -6.274000 -0.057080  0.000842  0.001574  0.039280  6.280000
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.0000176 0.0042450 0.0069580 0.0118300 0.0116000 0.0859300
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -16.540000 -0.012000  0.000006  0.464900  0.090890  18.990000
```

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

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -17.020000 -0.009506  0.000039  0.664600  0.100400  19.650000
```

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

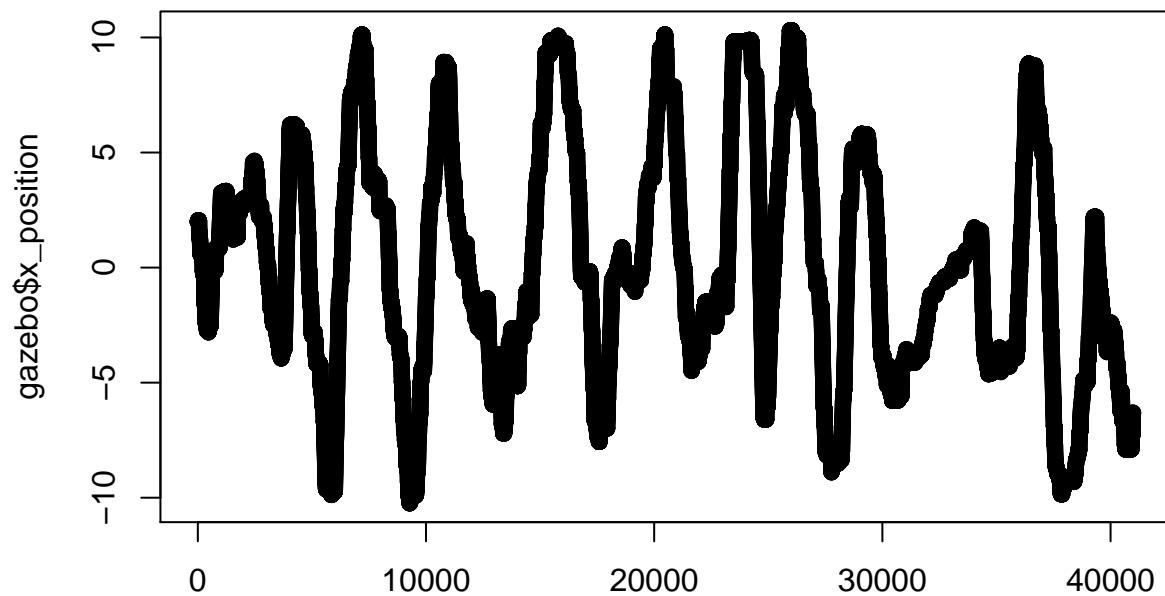
```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -6.276000 -0.187400 -0.005799  0.012250  0.006374  6.274000
```

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

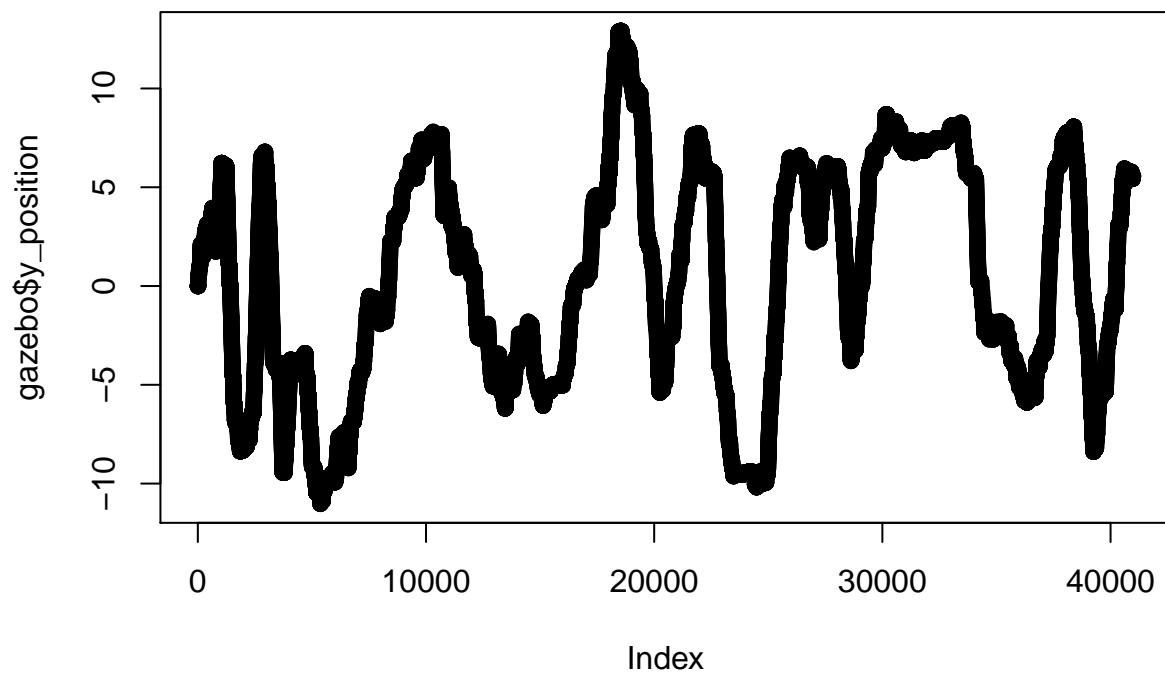
```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.000000  0.003948  0.059320  2.719000  4.787000 22.850000
```

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

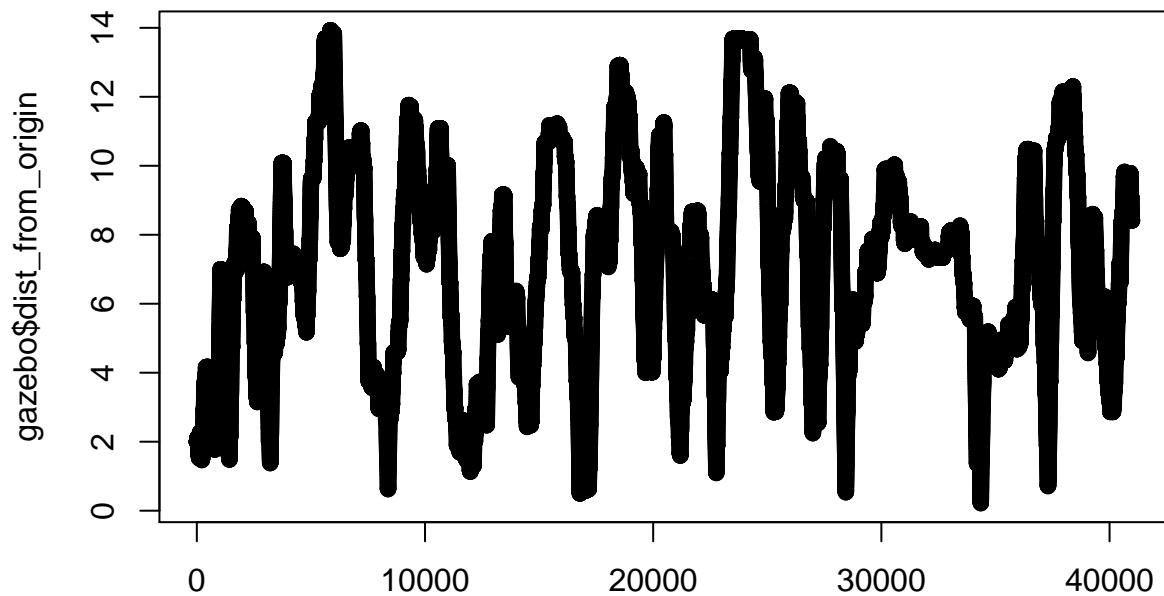
X coordinate of robot over time



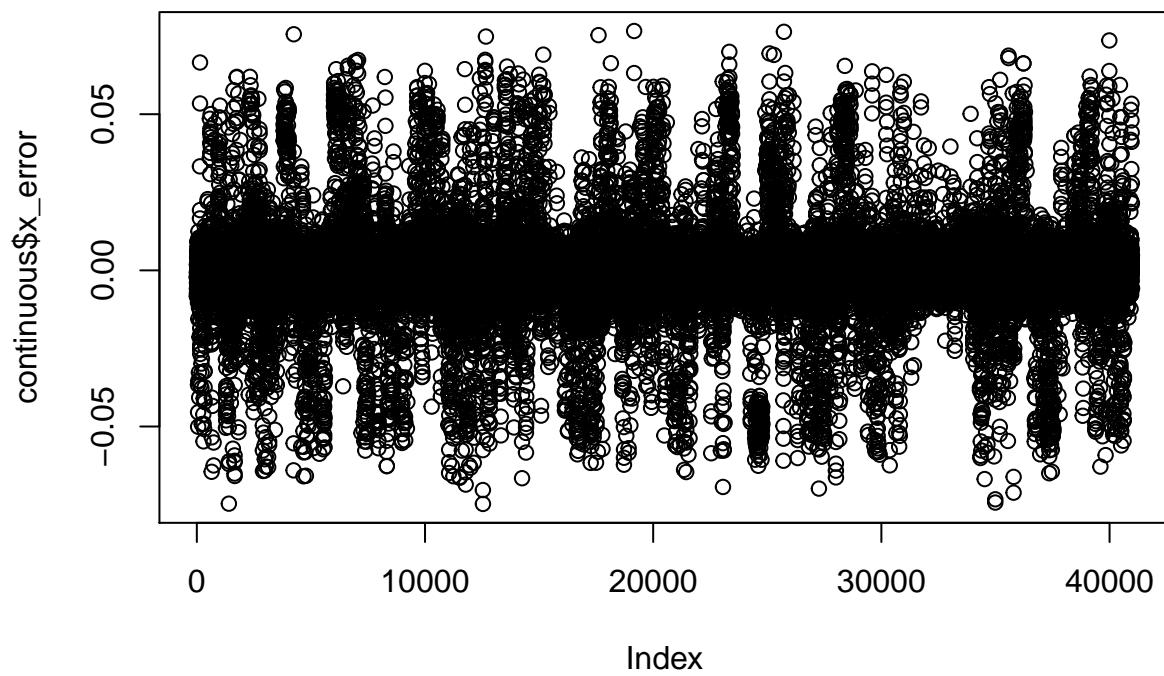
Y coordinate of robot over time



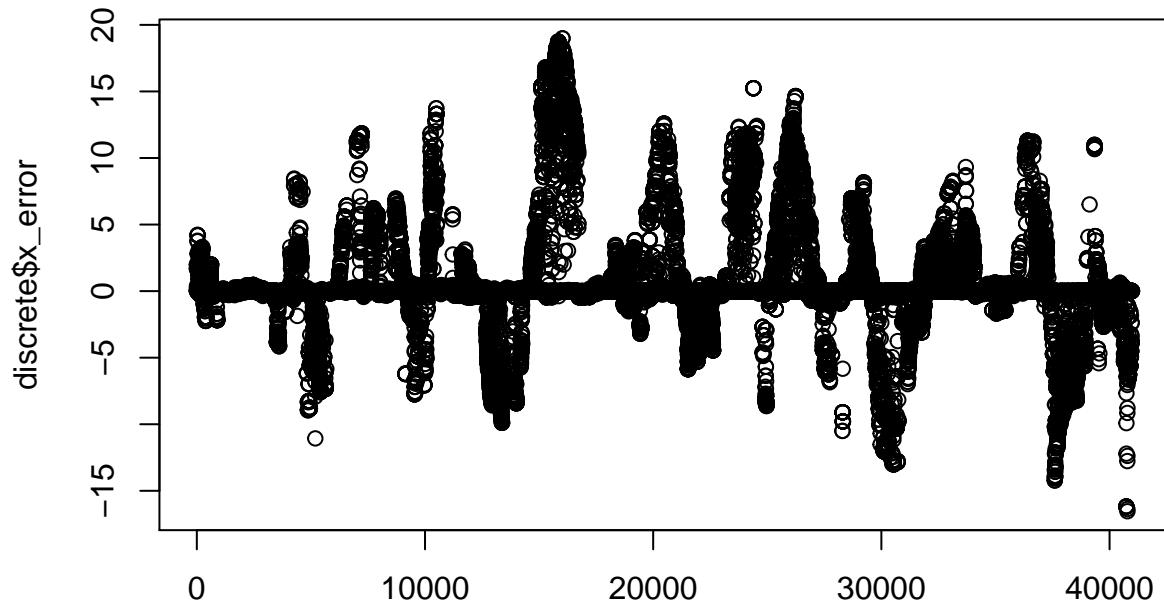
Distance from origin vs. time



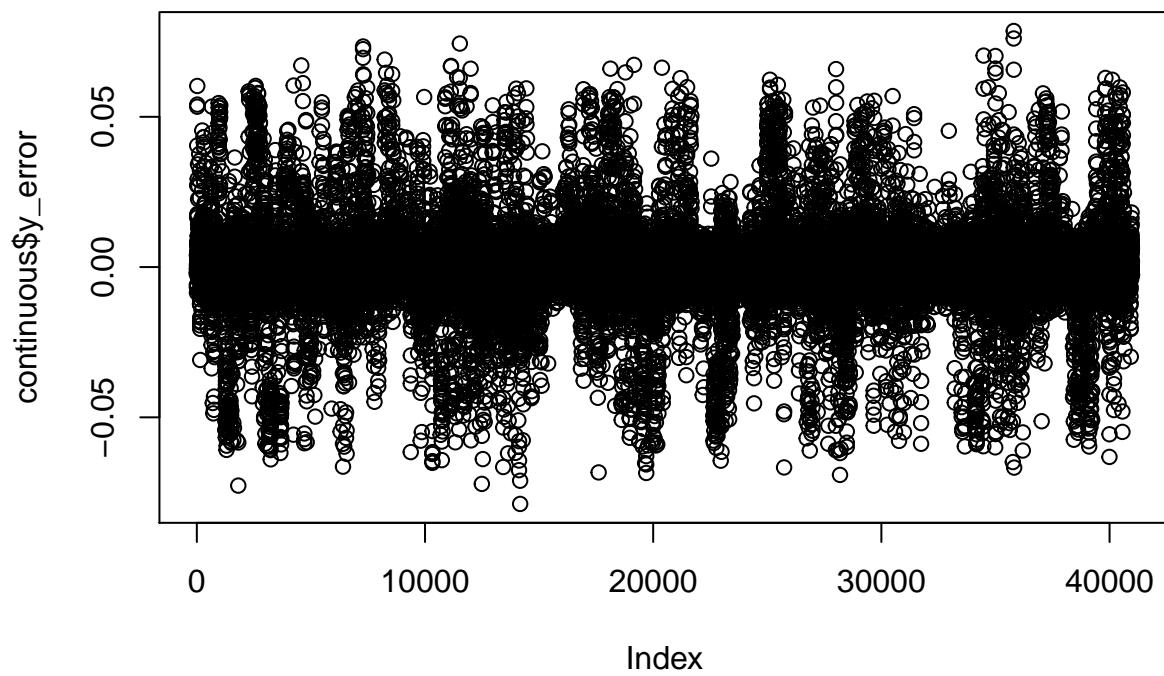
Continuous x_error over time



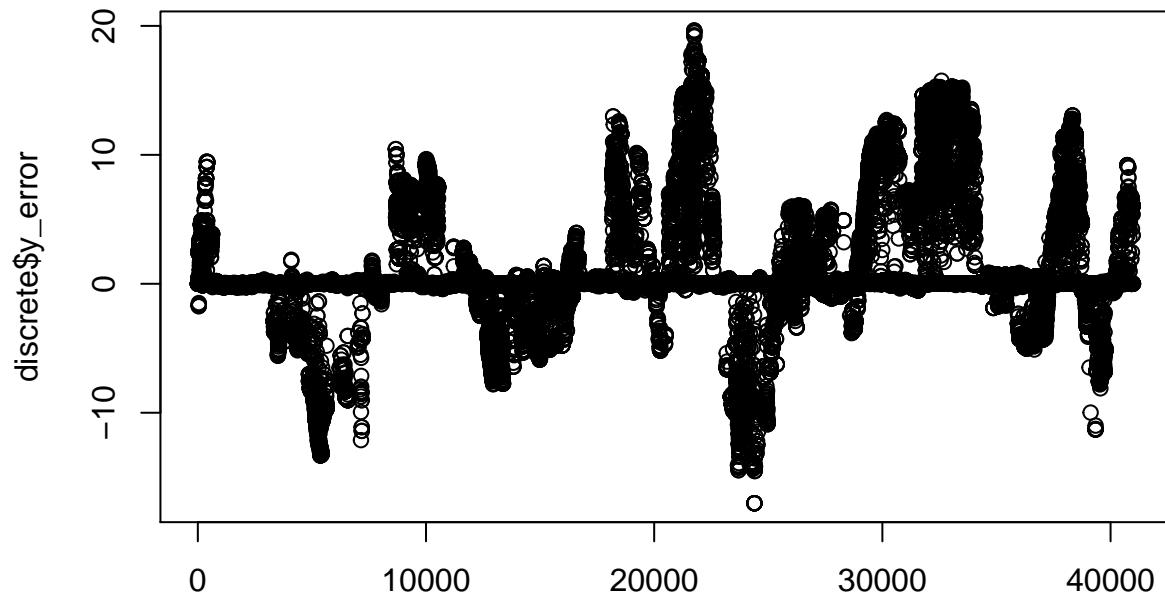
Discrete x_error over time



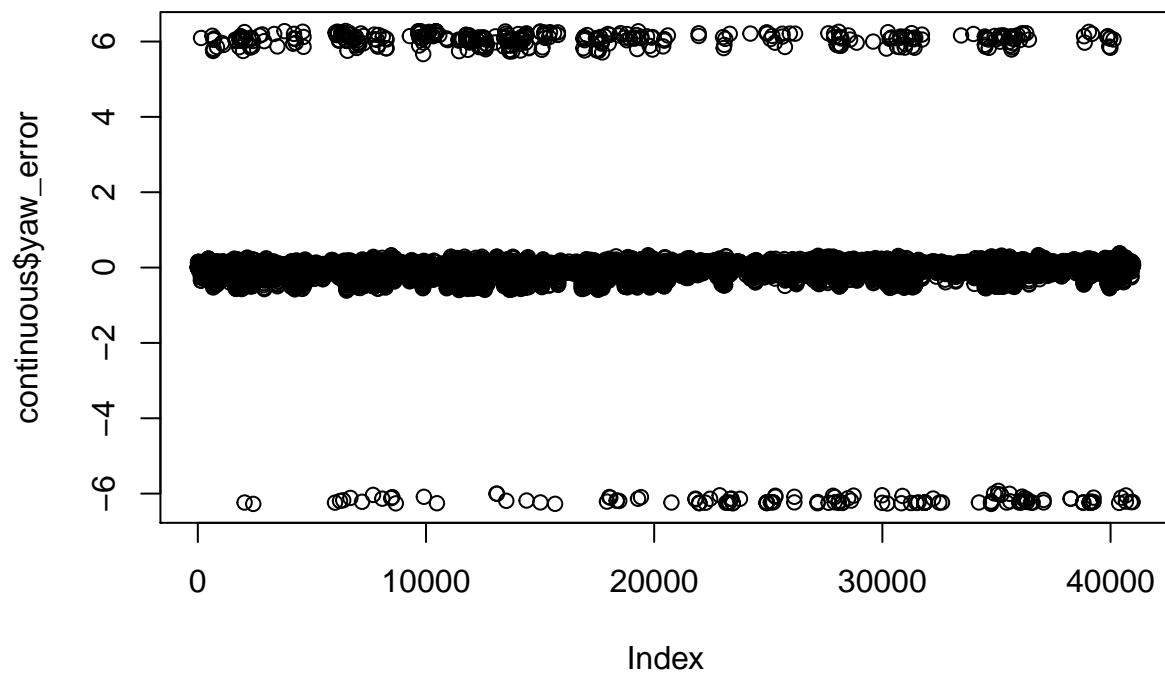
Continuous y_error over time



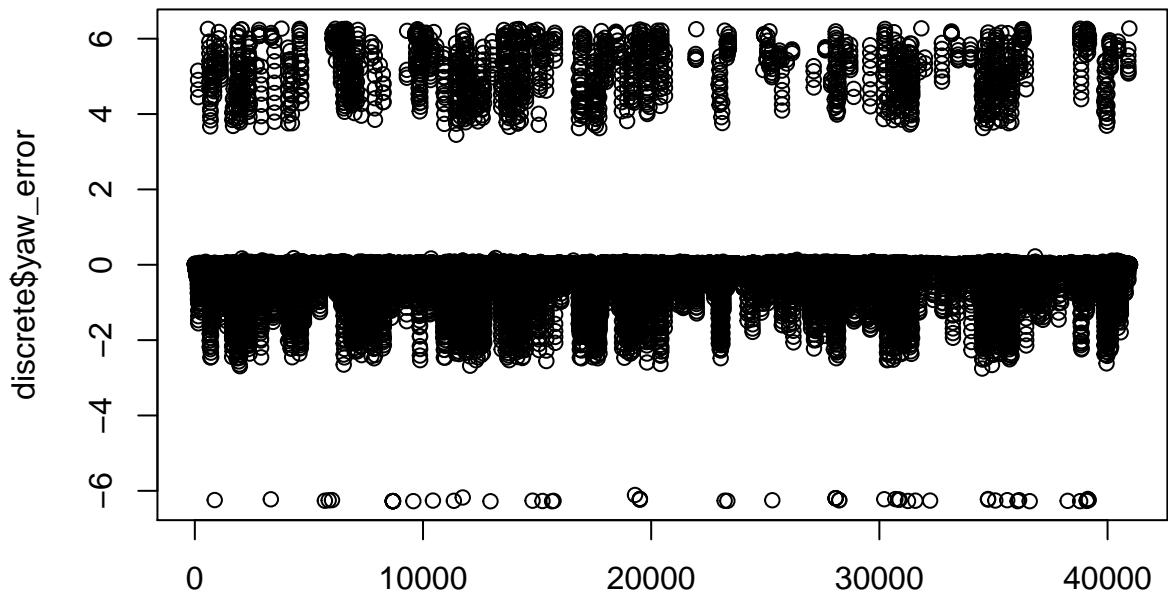
Discrete y_error over time



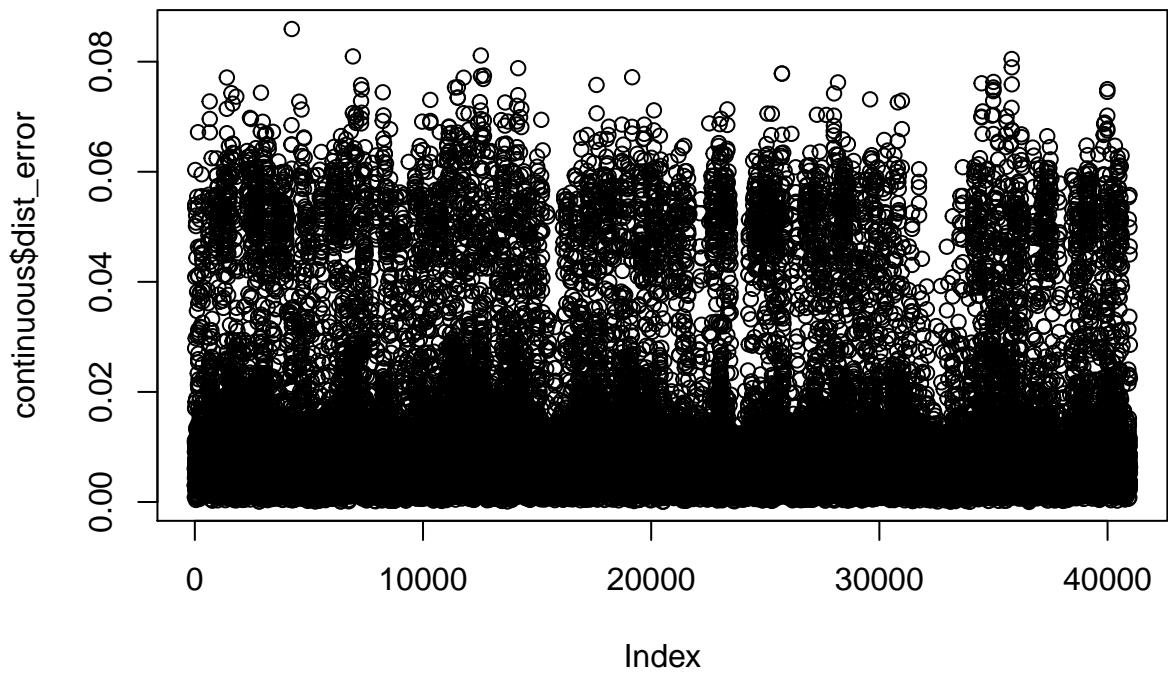
Continuous yaw error over time



Discrete yaw error over time



Continuous total distance error over time



Discrete total distance error over time

