

one_mobile_no_gps Turtlebot 1 Report

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This is a summary of the data from the one_mobile_no_gps experiment, Turtlebot #1.

The runtime of this experiment was 0 hours, 6 minutes, and 41 seconds.

The total number of external pose measurements received by the robot during this time was 0 which means poses were received at an average of 0 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.  
## -15.3800 -0.2537  1.6410   0.4261  2.7250   4.1320
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -1.400   3.767   5.909   7.252   7.104   33.820
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -3.13900 -1.55400 -0.08289 -0.02886  1.55200  3.13700
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
##  0.00002  3.92800  6.40600  7.80900  7.78100 37.16000
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -13.7400 -0.2386  1.8450   0.7307  2.9650   4.5060
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -1.414   3.692   5.783   7.209   6.948   34.540
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -3.14000 -1.55400 -0.08535 -0.02772  1.55500  3.14000
```

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

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
##  0.00002  3.90500  6.38400  7.78300  7.75200 37.17000
```

```
summary(noisy_odom$x_err)
```

```
##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.  
## -2.9320 -0.9542 -0.8589 -0.9189 -0.7750  0.3500
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -0.5054  0.7042  0.7902  0.9333  0.9338  6.0500

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000006 1.081000 1.183000 1.363000 1.340000 6.294000

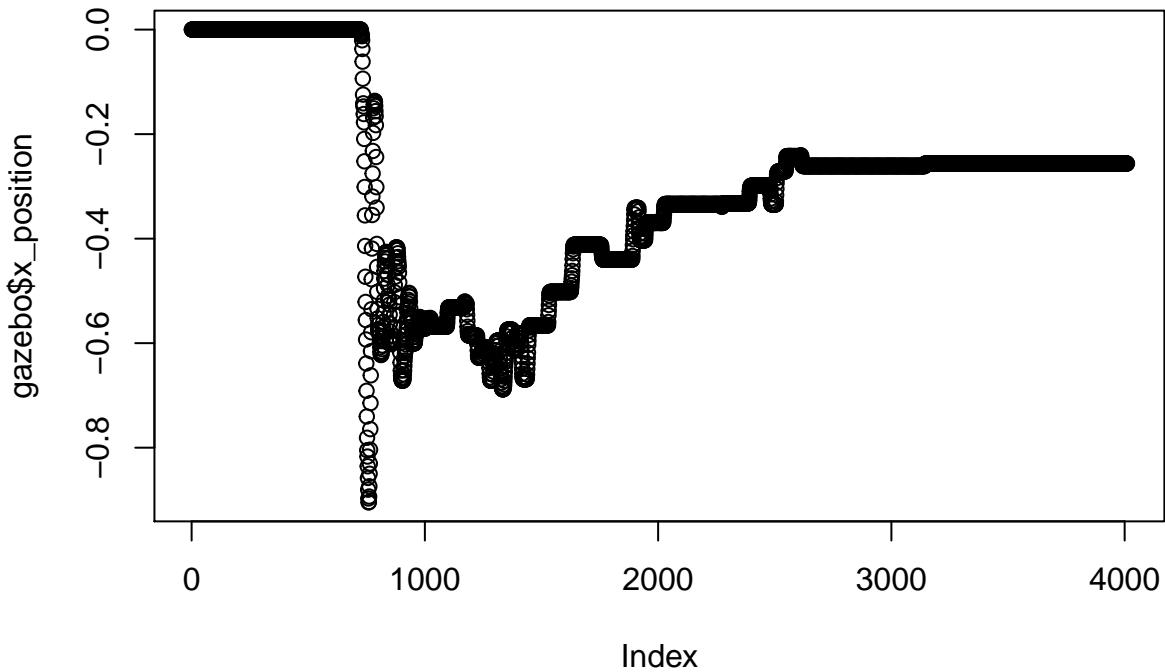
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

if (NROW(noisy_odom) > 0) {
  summary(noisy_odom$x_variance)
  summary(noisy_odom$y_variance)
  summary(noisy_odom$yaw_variance)
}

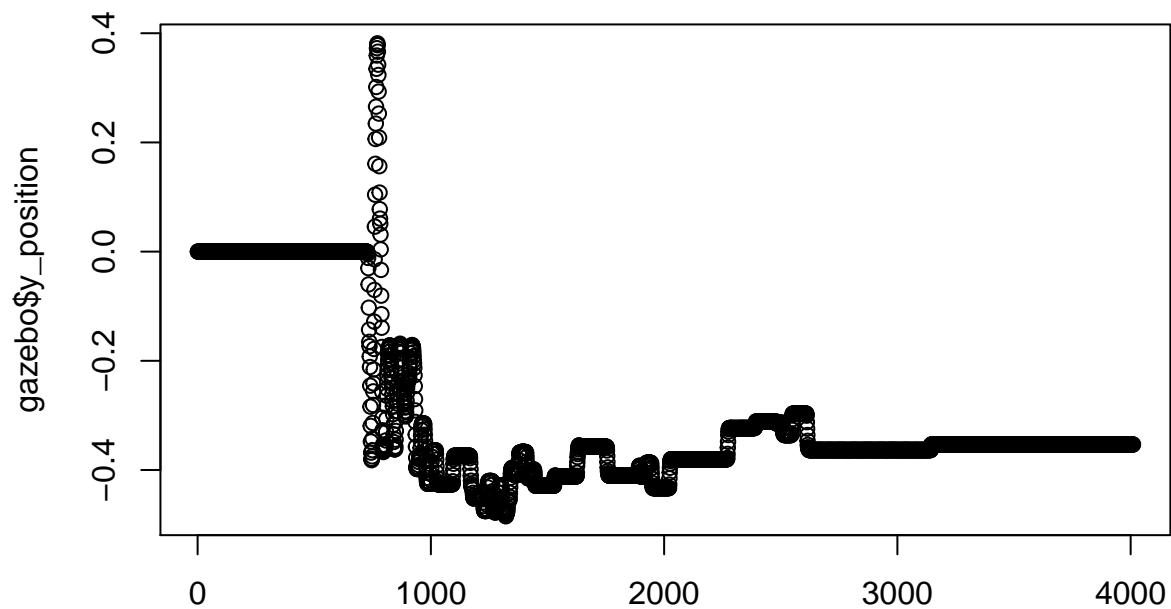
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000e+00 2.303e-06 4.379e-06 1.517e-03 6.419e-06 8.753e-03

```

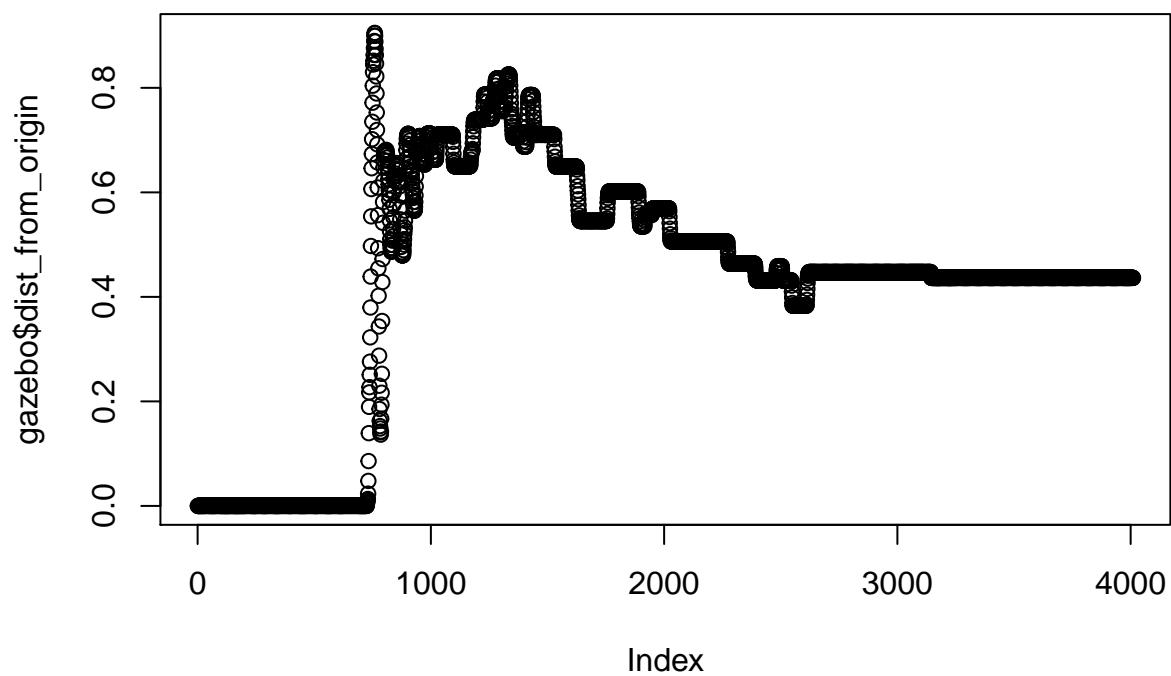
X coordinate of robot over time



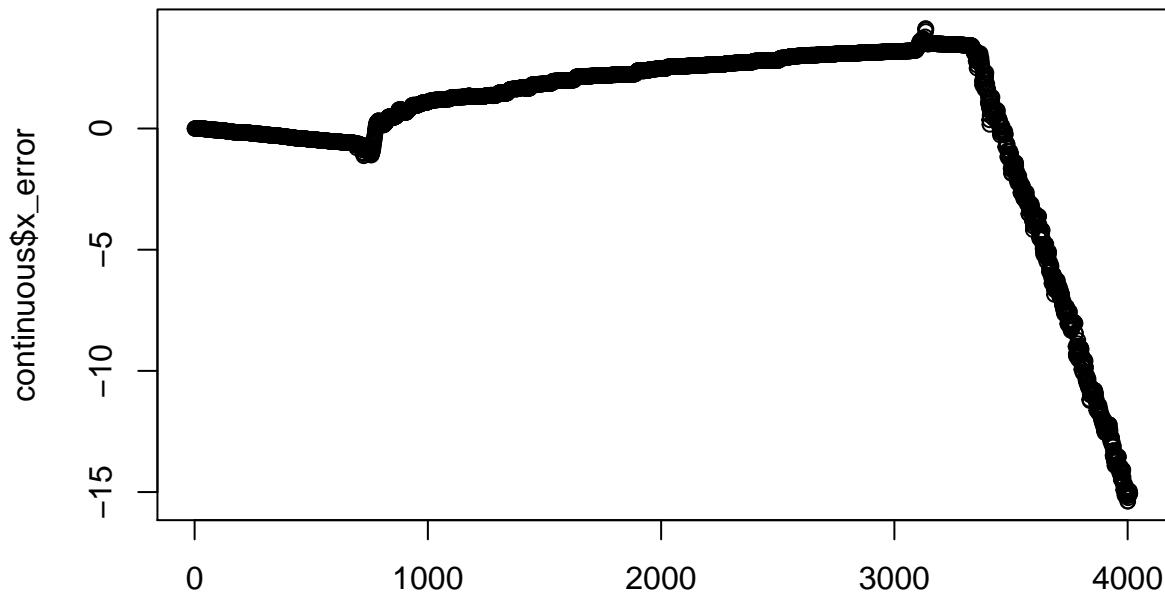
Y coordinate of robot over time



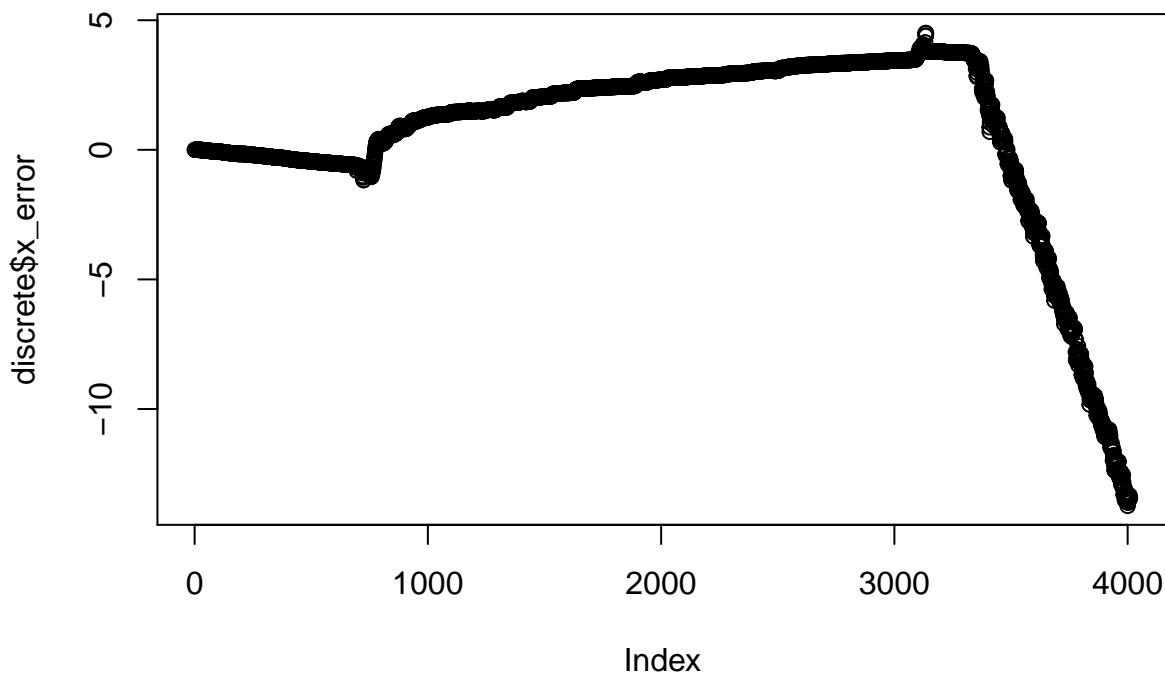
Distance from origin vs. time



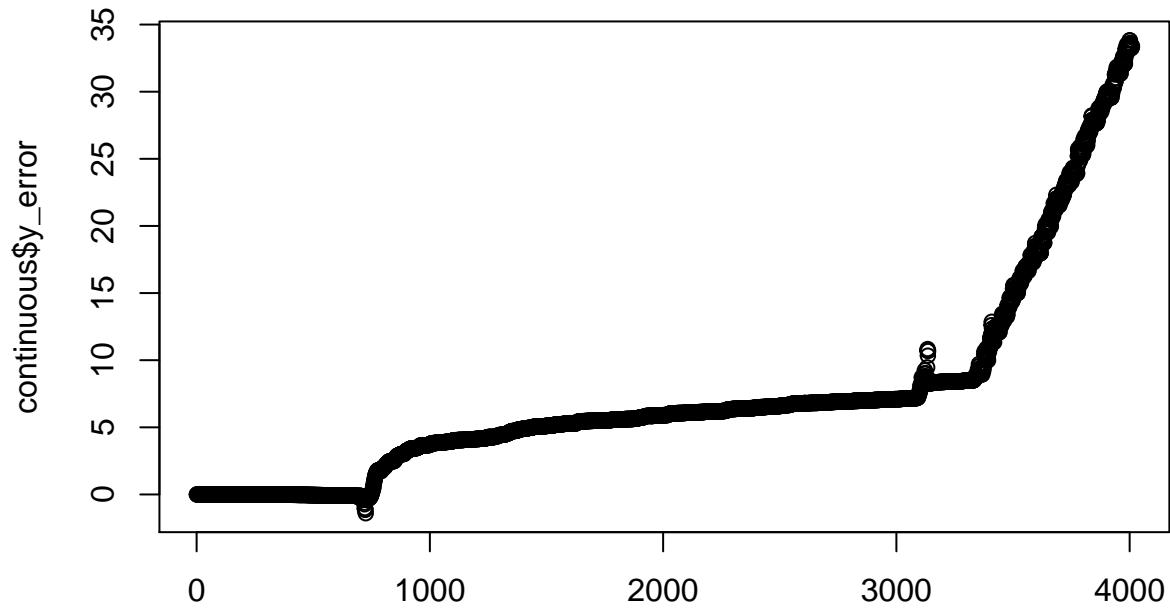
Continuous x_error over time



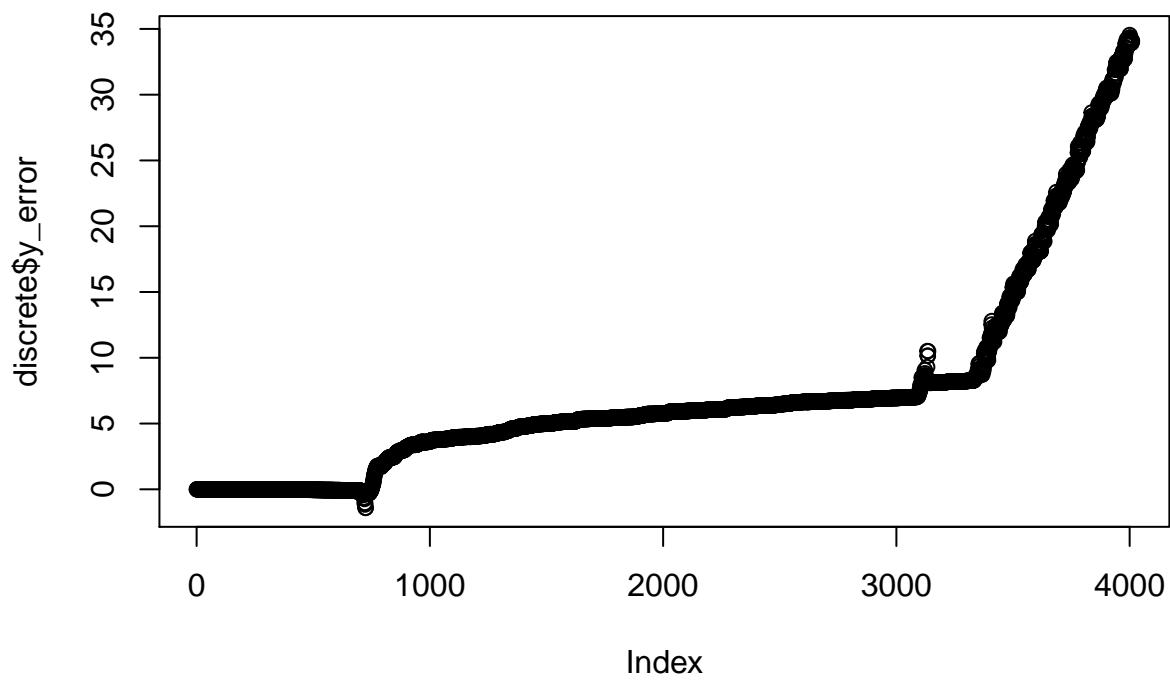
Discrete x_error over time



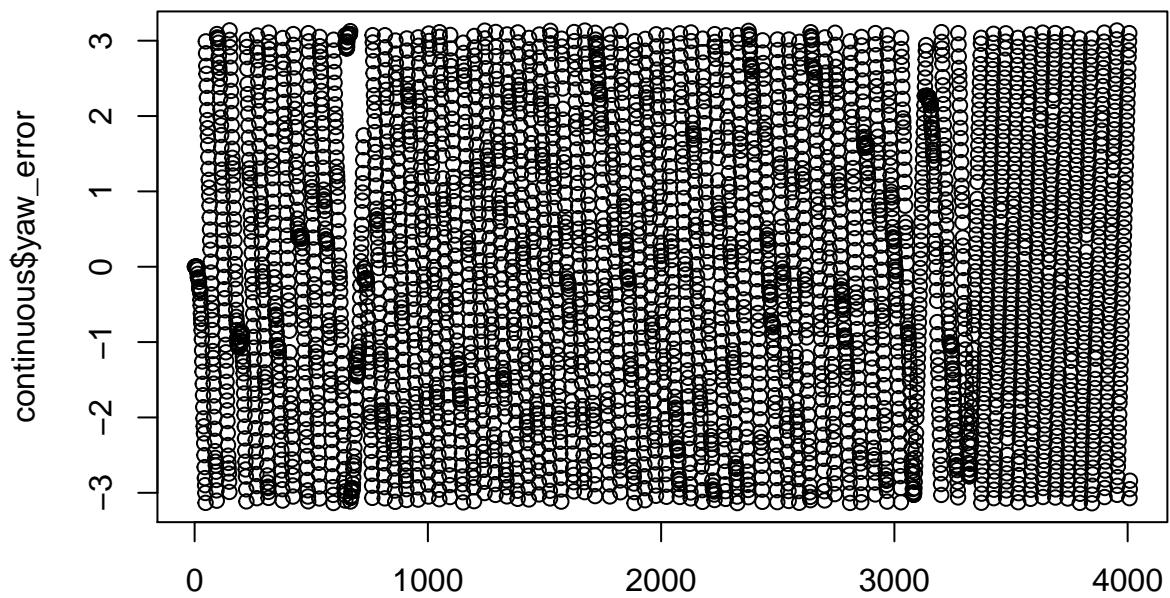
Continuous y_error over time



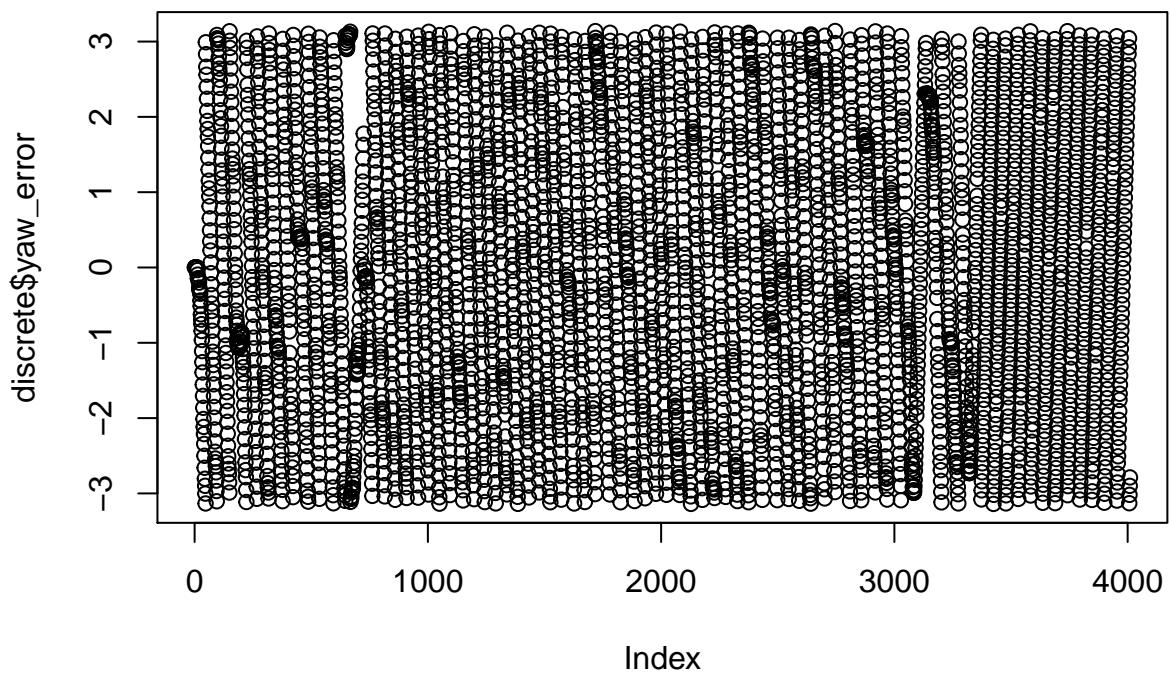
Discrete y_error over time



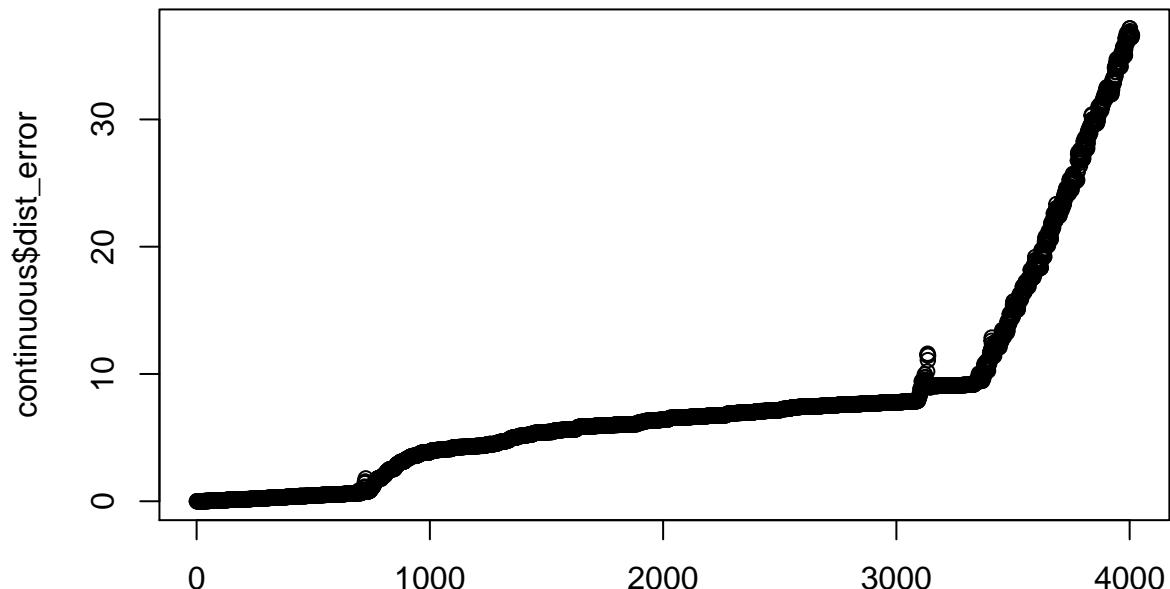
Continuous yaw error over time



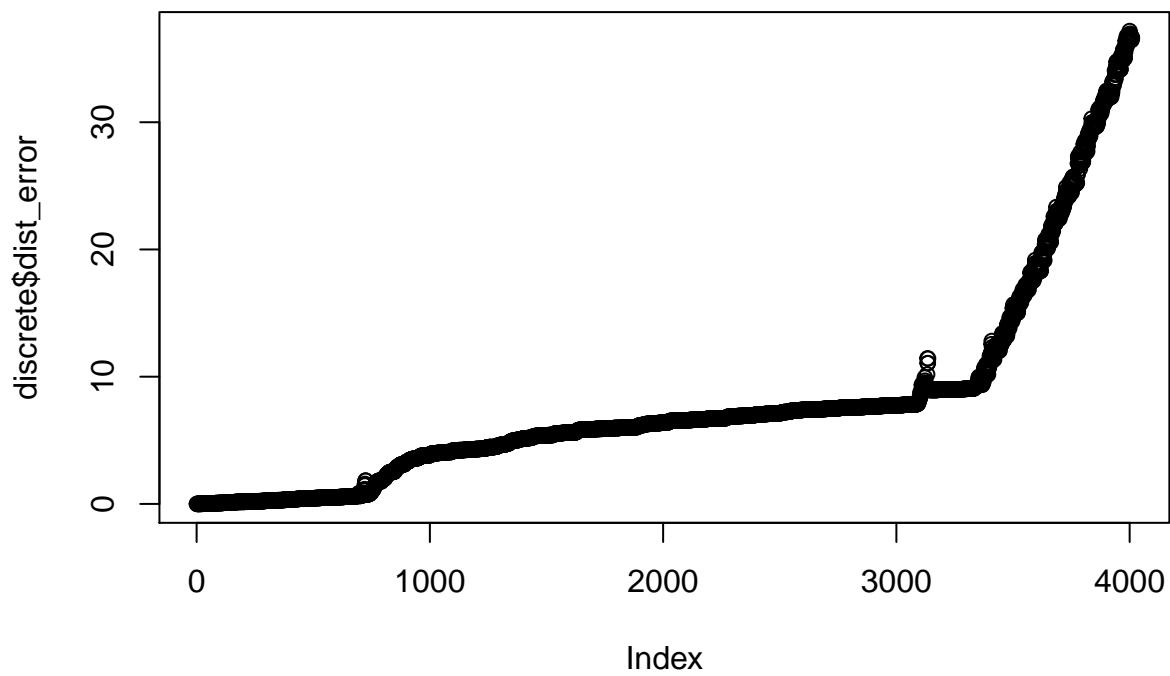
Discrete yaw error over time



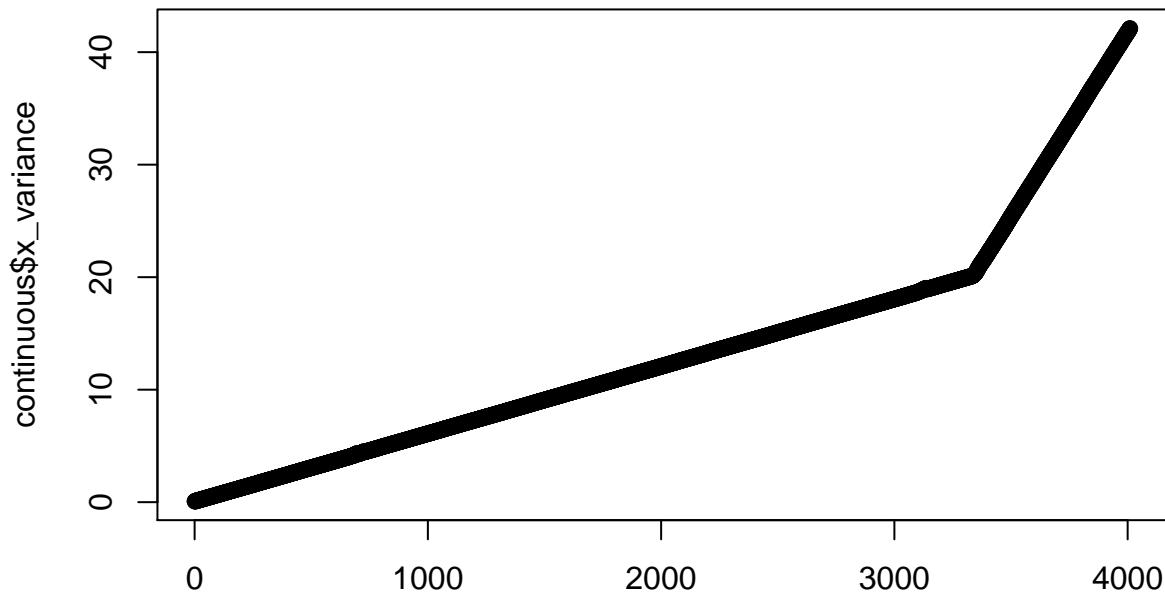
Continuous total distance error over time



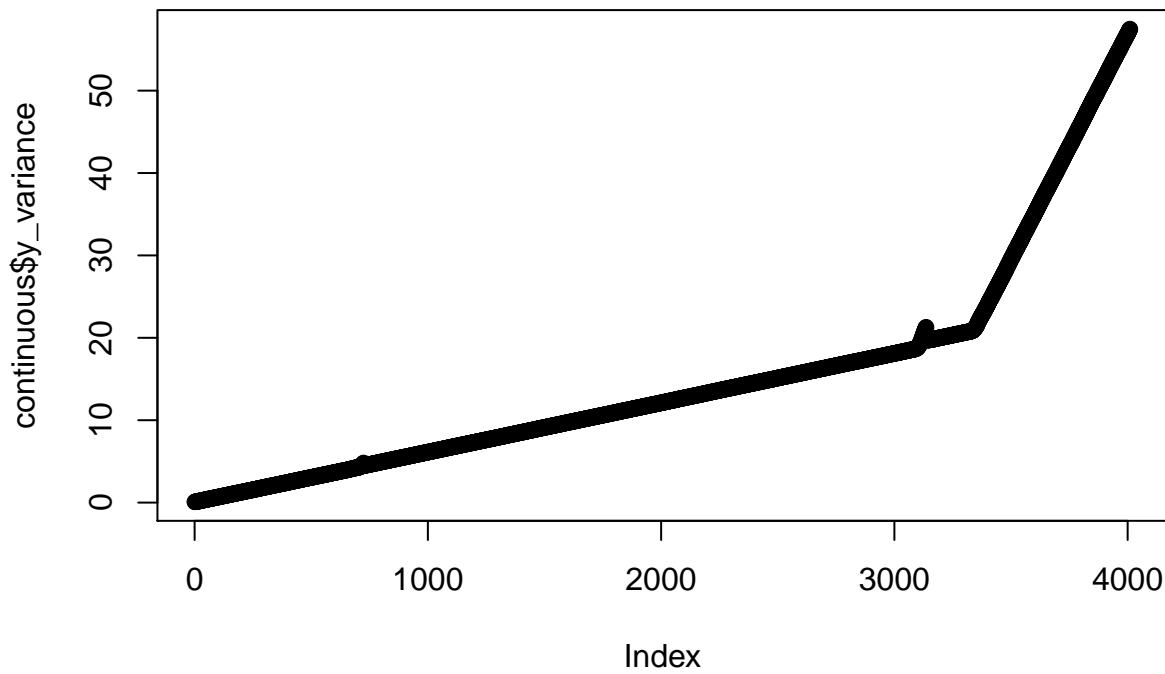
Discrete total distance error over time



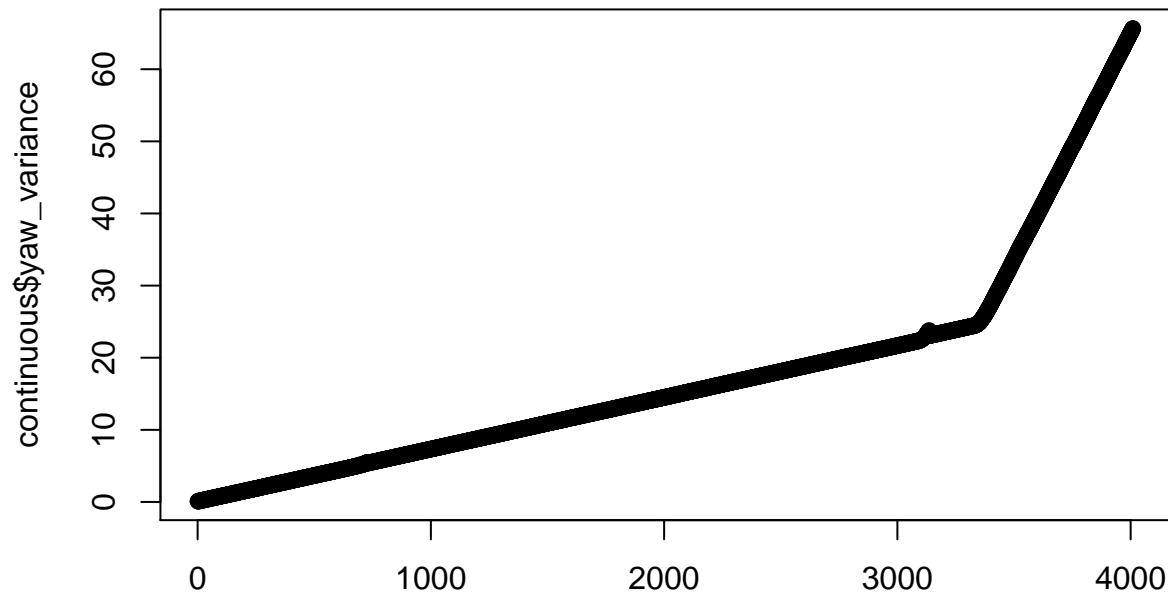
Continuous Filter X Variance Over Time



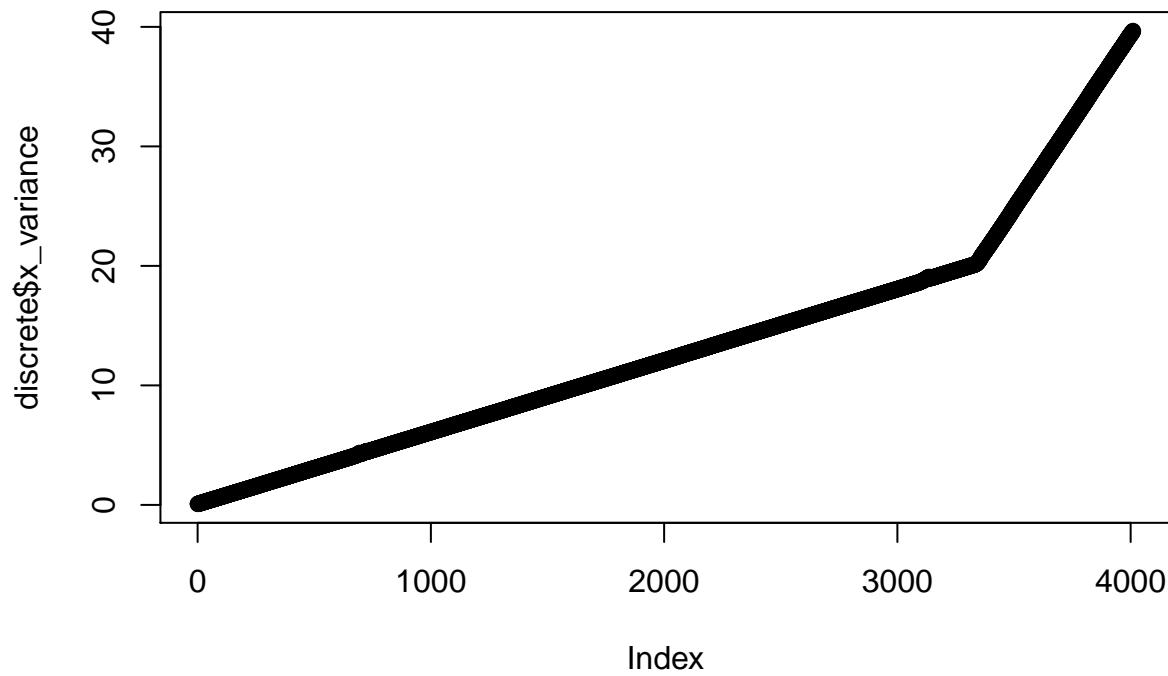
Continuous Filter Y Variance Over Time



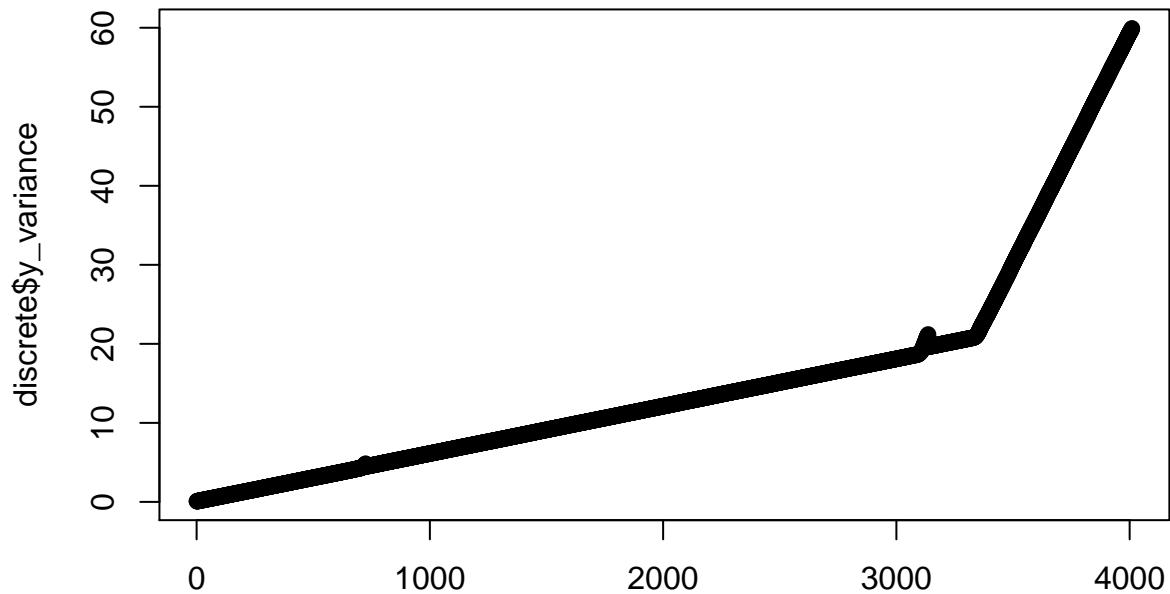
Continuous Filter Yaw Variance Over Time



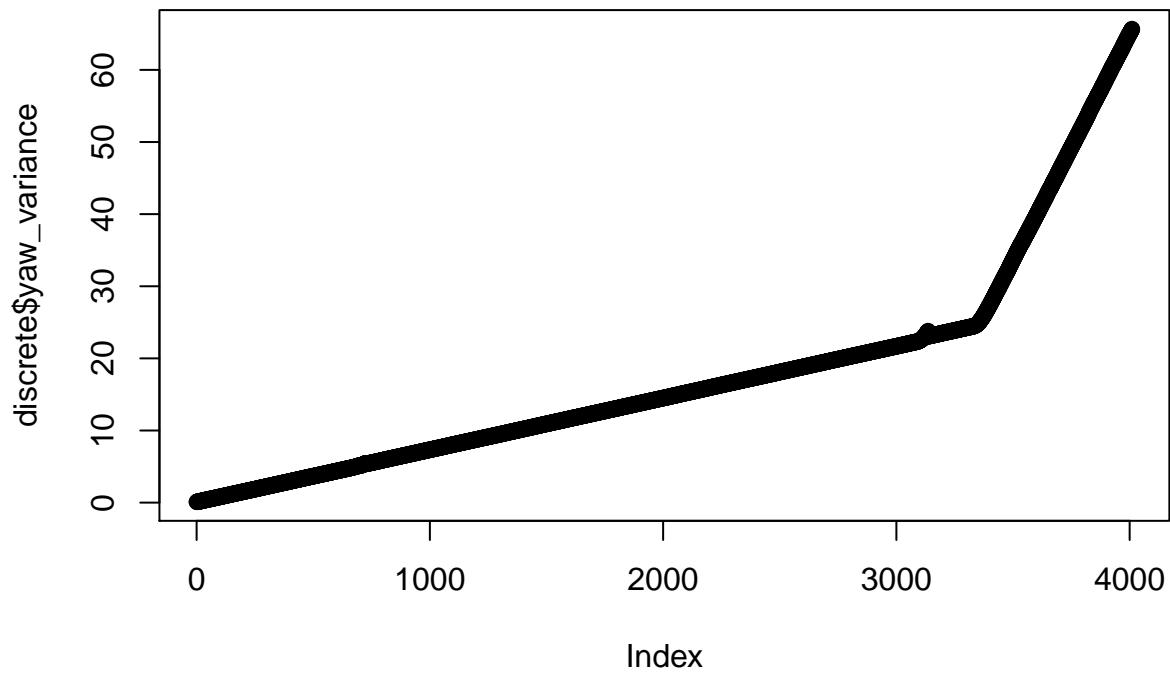
Discrete Filter X Variance Over Time



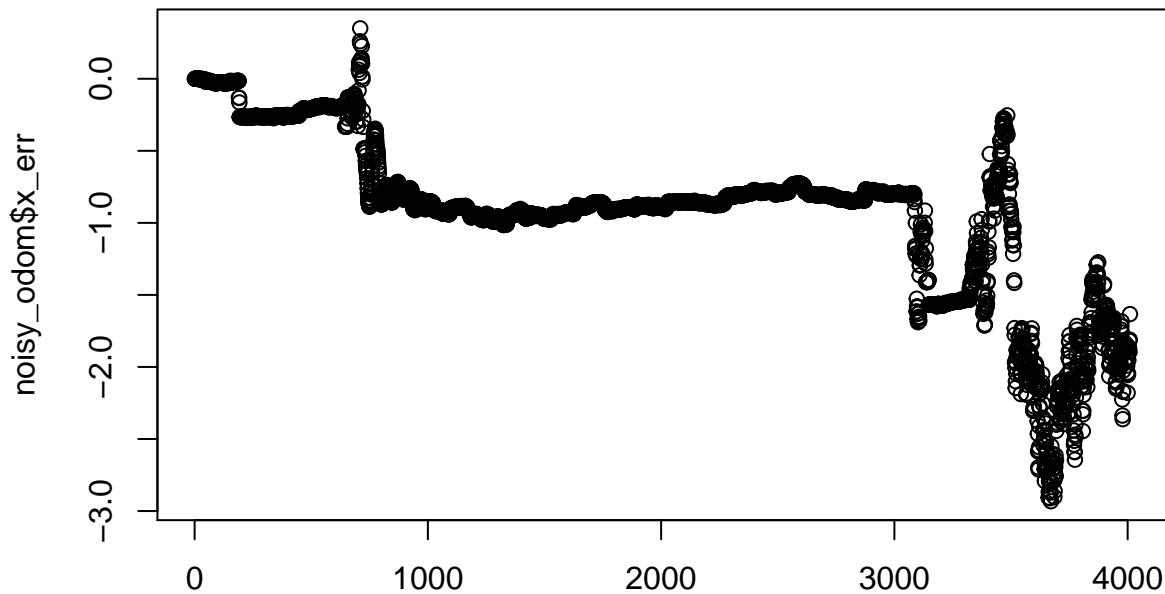
Discrete Filter Y Variance Over Time



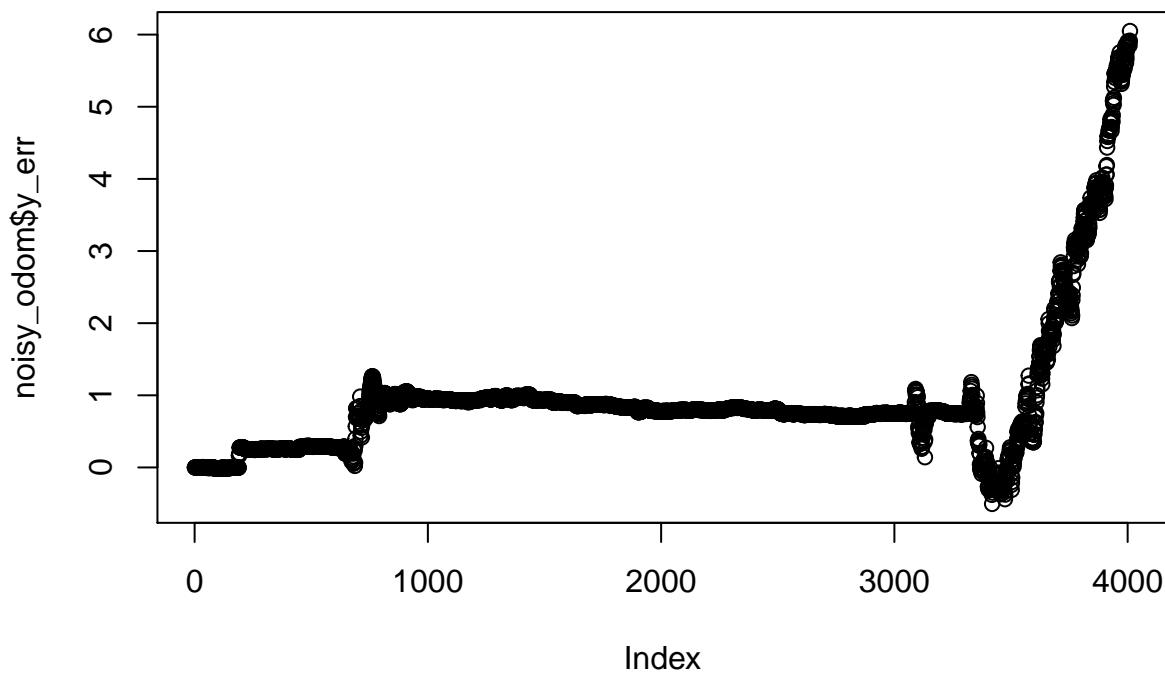
Discrete Filter Yaw Variance Over Time



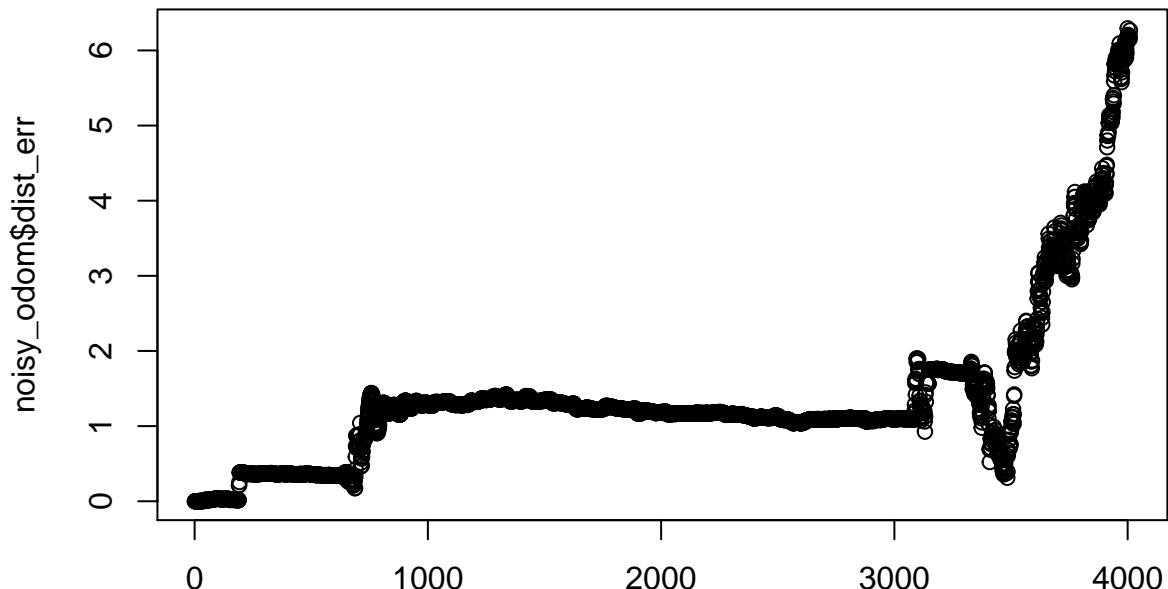
Noisy Odom X Error Over Time



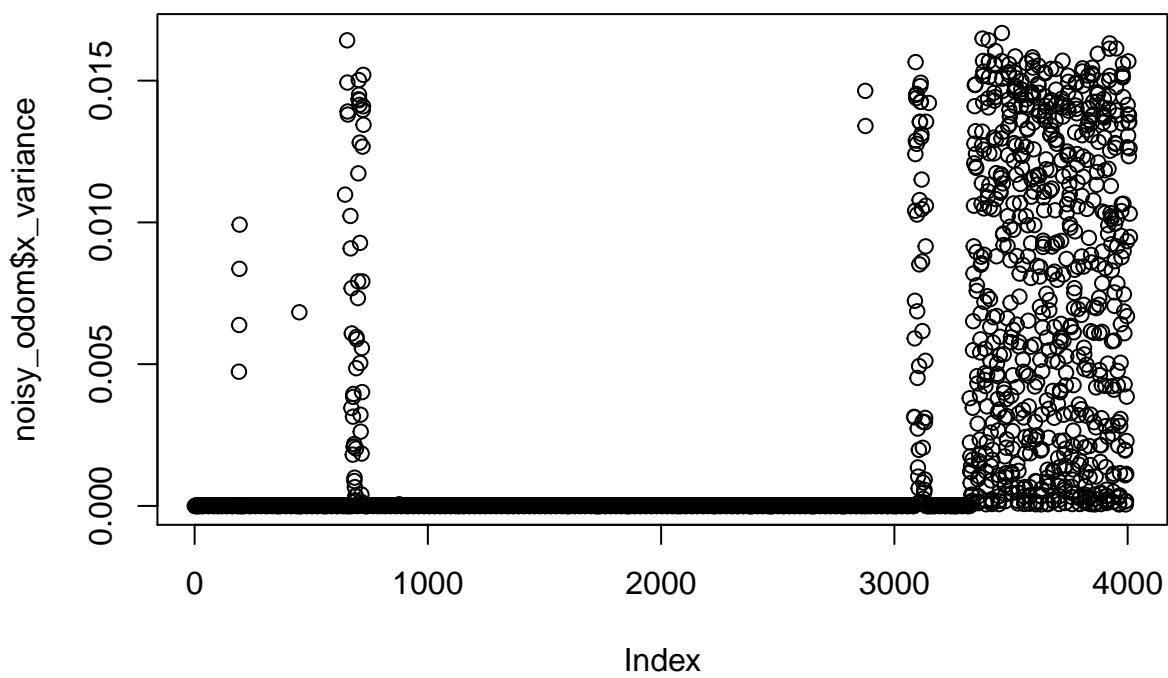
Noisy Odom Y Error Over Time



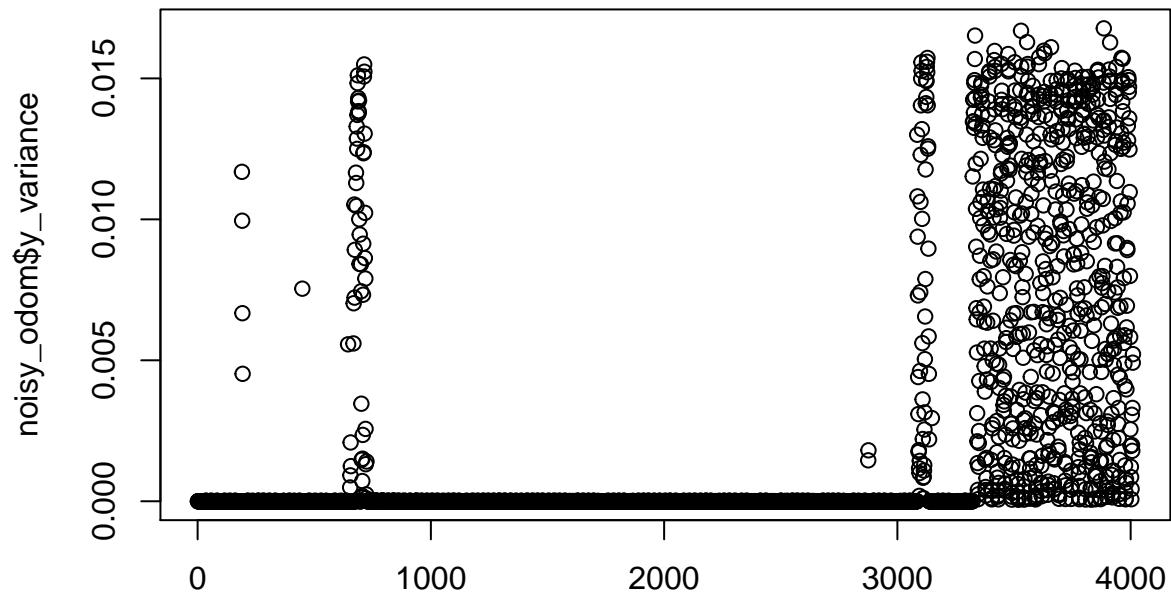
Noisy Odom Horizontal Distance Error Over Time



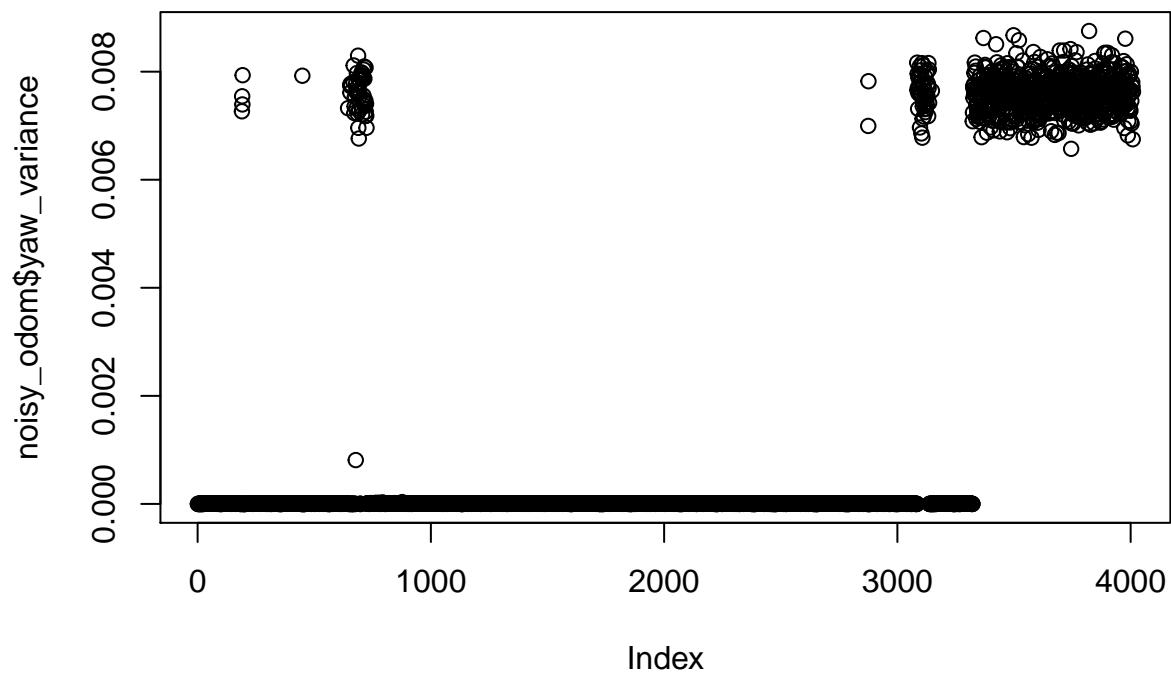
Variance of X Coordinate in Noisy Odometry



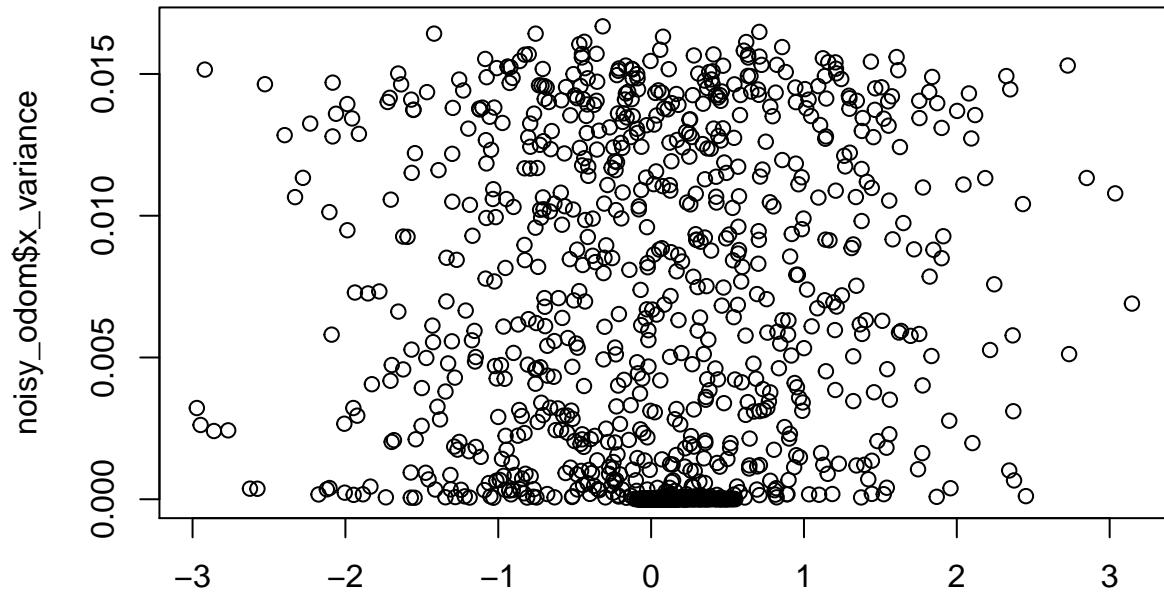
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

