

one_mobile_no_gps Turtlebot 1 Report

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August 15, 2016

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 42.1 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.
## -87.58000 -62.74000 -34.02000 -37.45000 -4.84600  0.03437
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -105.600 -64.900 -17.840 -34.810 -2.915   0.000
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -3.1370 -1.4250  0.1371  0.0973  1.6490  3.1410
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 0.00001  5.65600  38.42000  51.71000 90.27000 137.20000
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -88.38000 -63.17000 -34.06000 -37.62000 -4.59200  0.02959
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -105.100 -64.640 -17.910 -34.690 -2.826   0.000
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -3.14000 -1.42400  0.13920  0.09454  1.64700  3.13900
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 0.00001  5.39200  38.48000  51.73000 90.38000 137.30000
```

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

```
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -4.143000 -0.881900 -0.209200 -0.458100 -0.009782  2.543000
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -5.8500 -2.7220 -1.7740 -1.7180 -0.1220  0.5727

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000007 0.664500 2.228000 2.098000 3.205000 5.852000

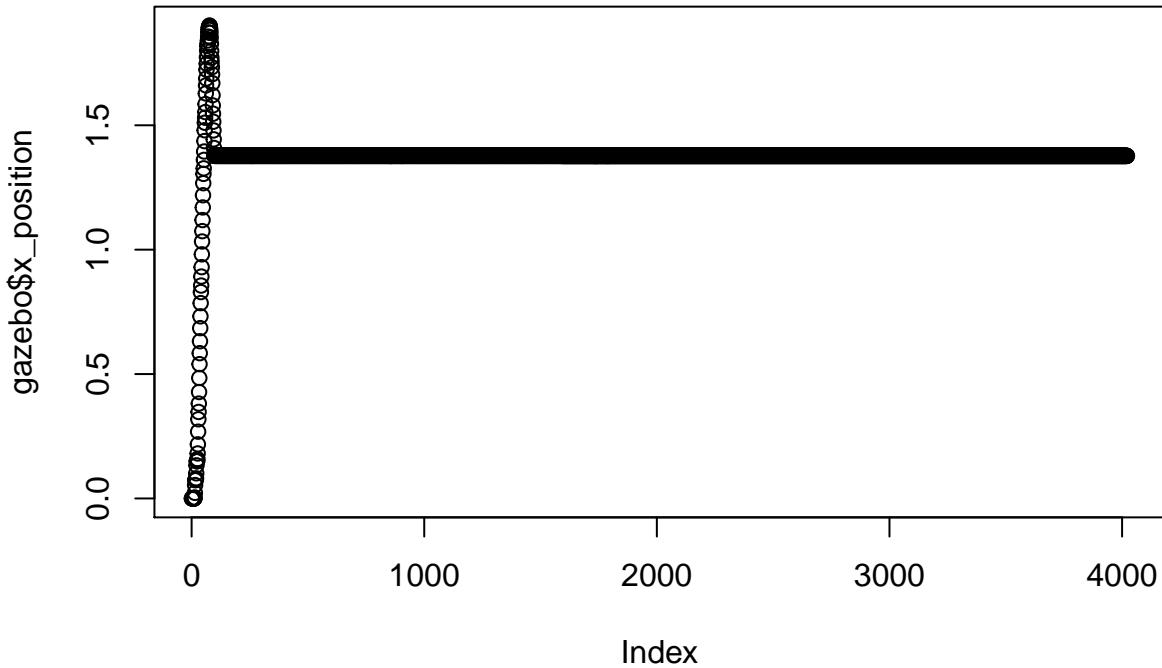
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

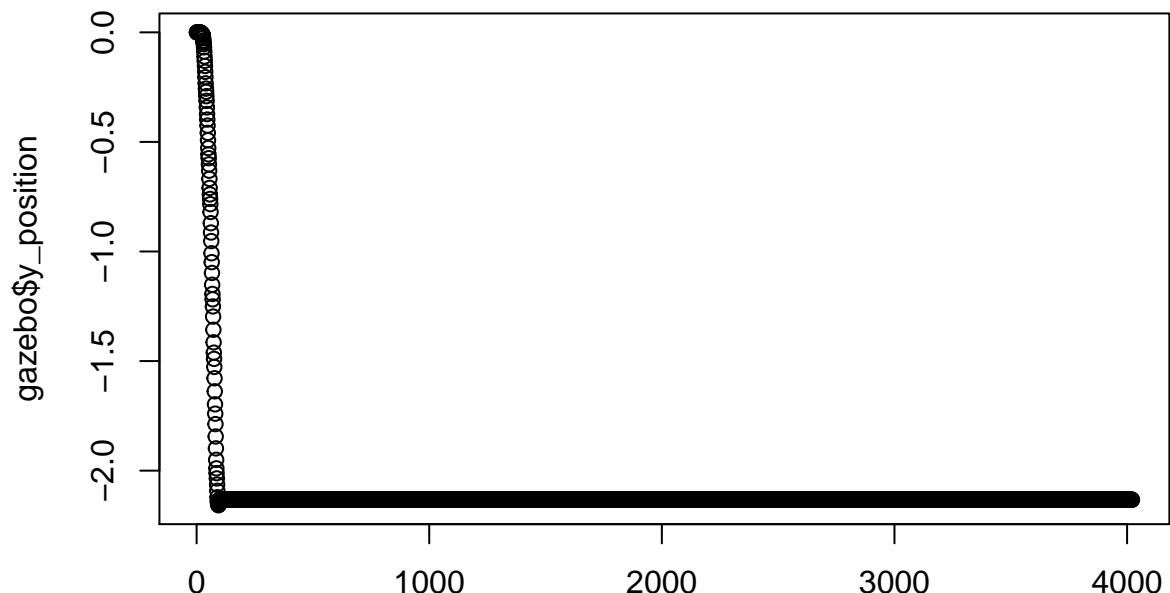
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000e+00 4.959e-06 7.396e-03 5.353e-03 7.724e-03 8.720e-03

```

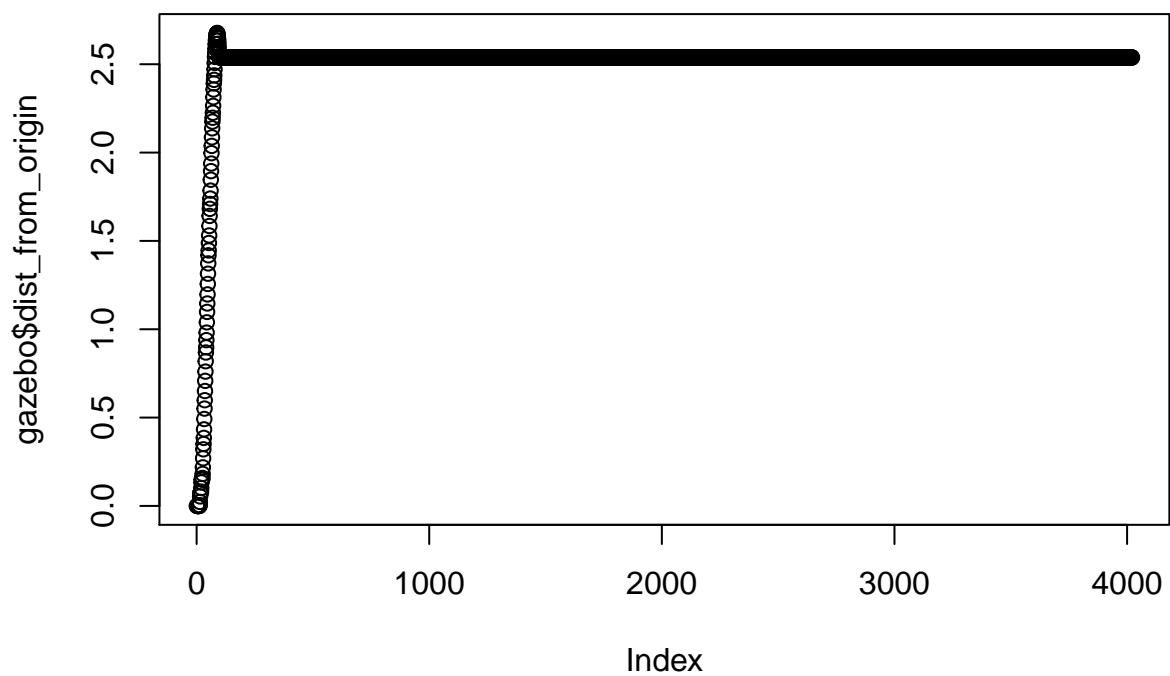
X coordinate of robot over time



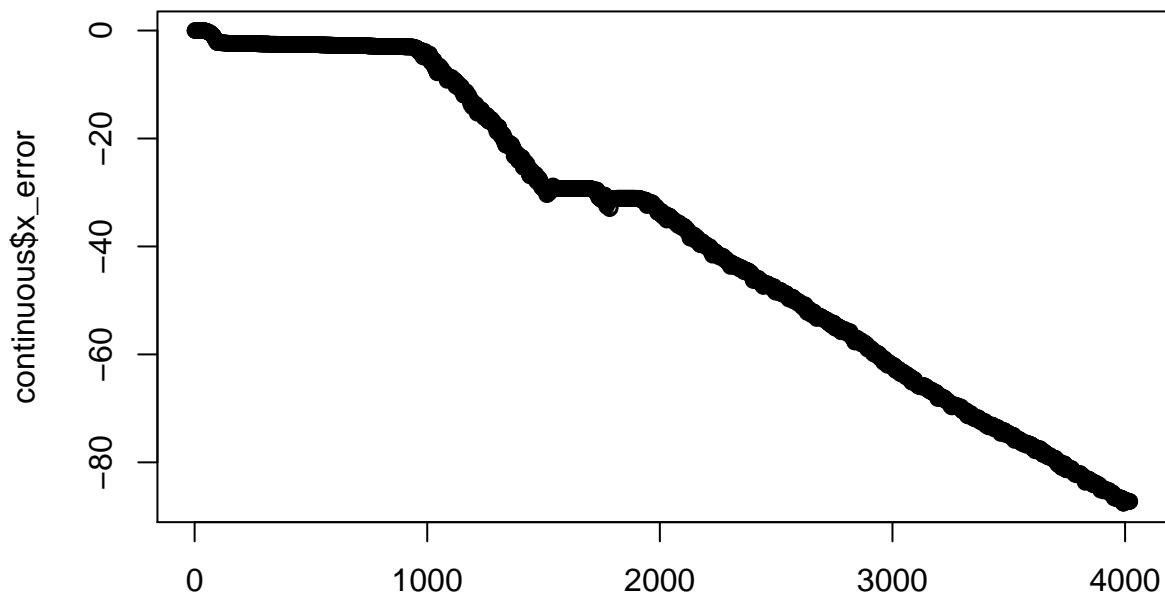
Y coordinate of robot over time



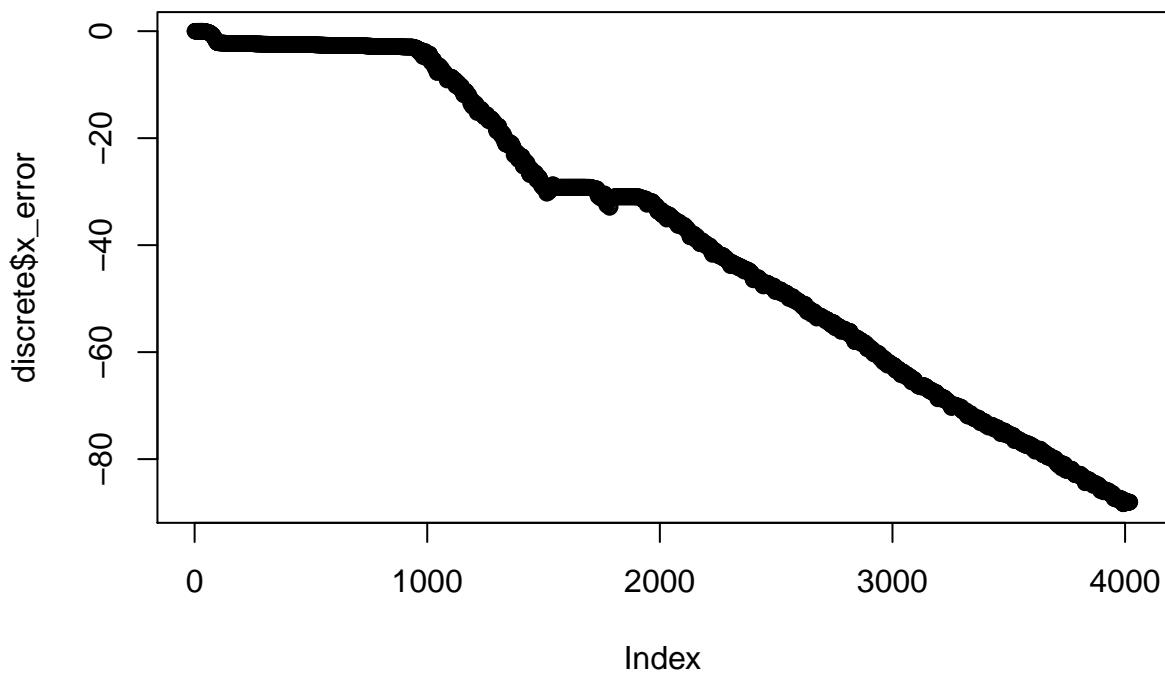
Distance from origin vs. time



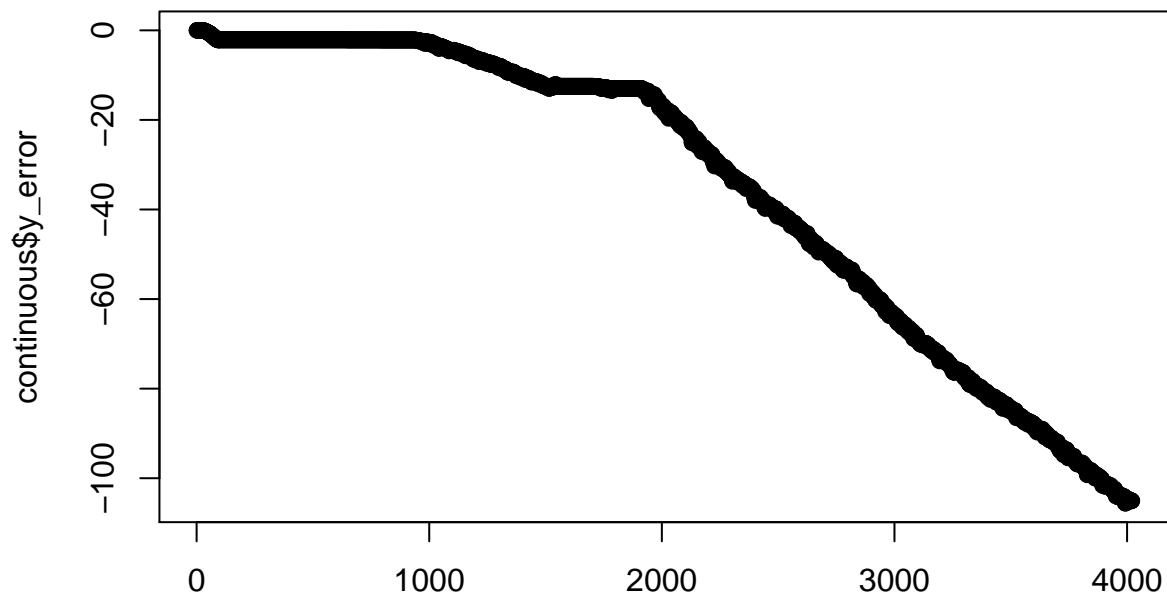
Continuous x_error over time



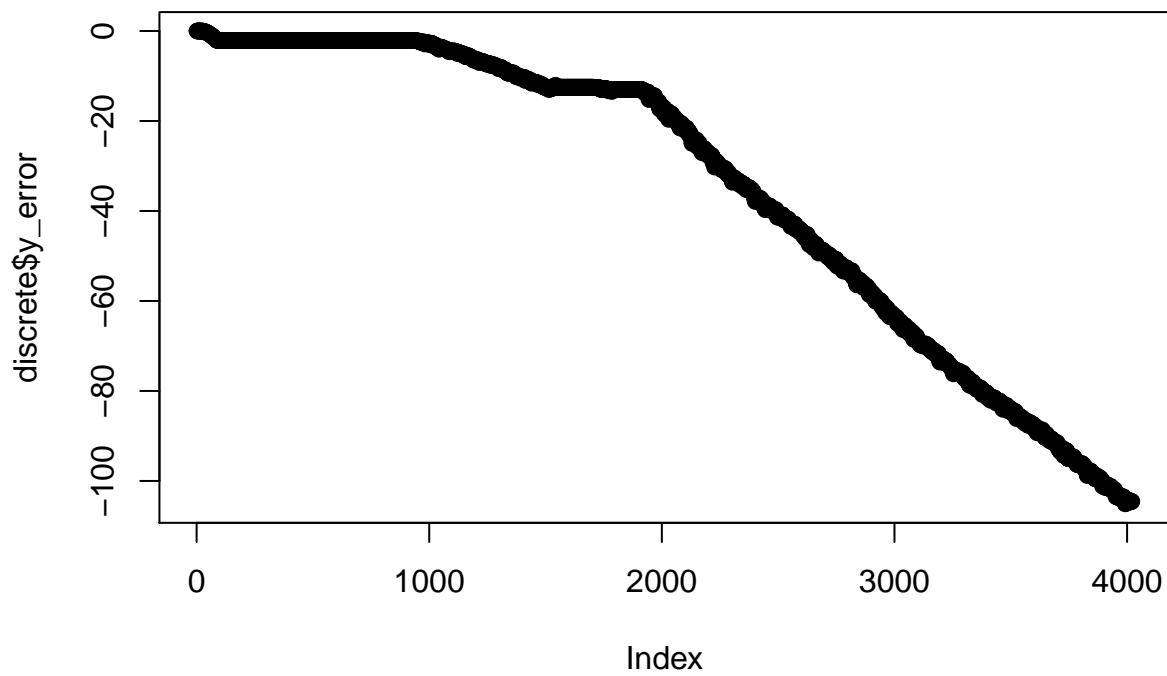
Discrete x_error over time



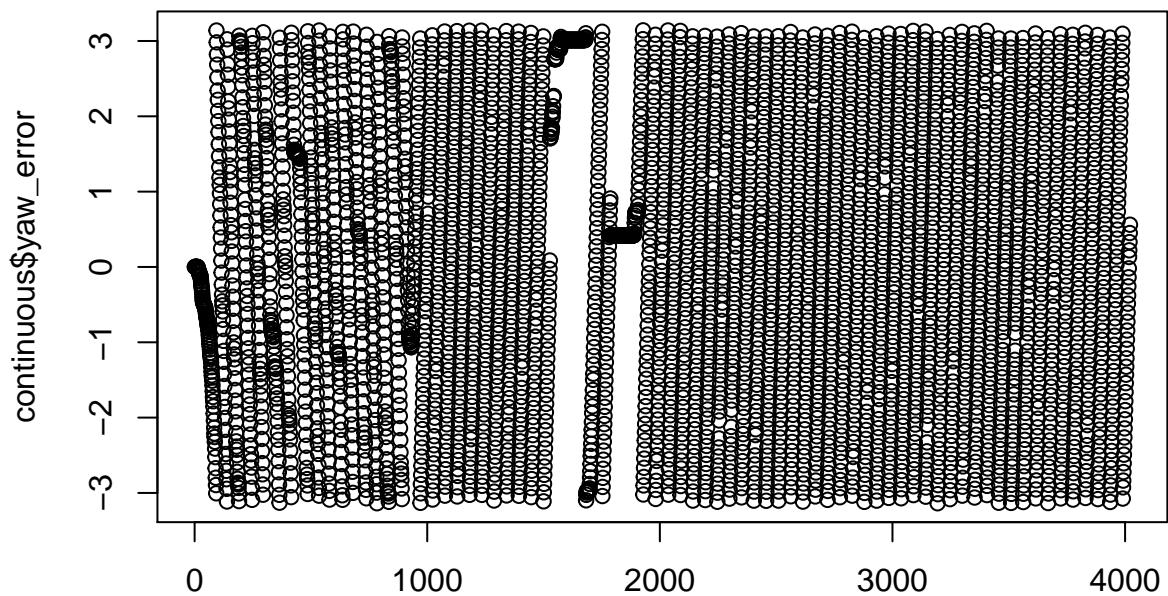
Continuous y_error over time



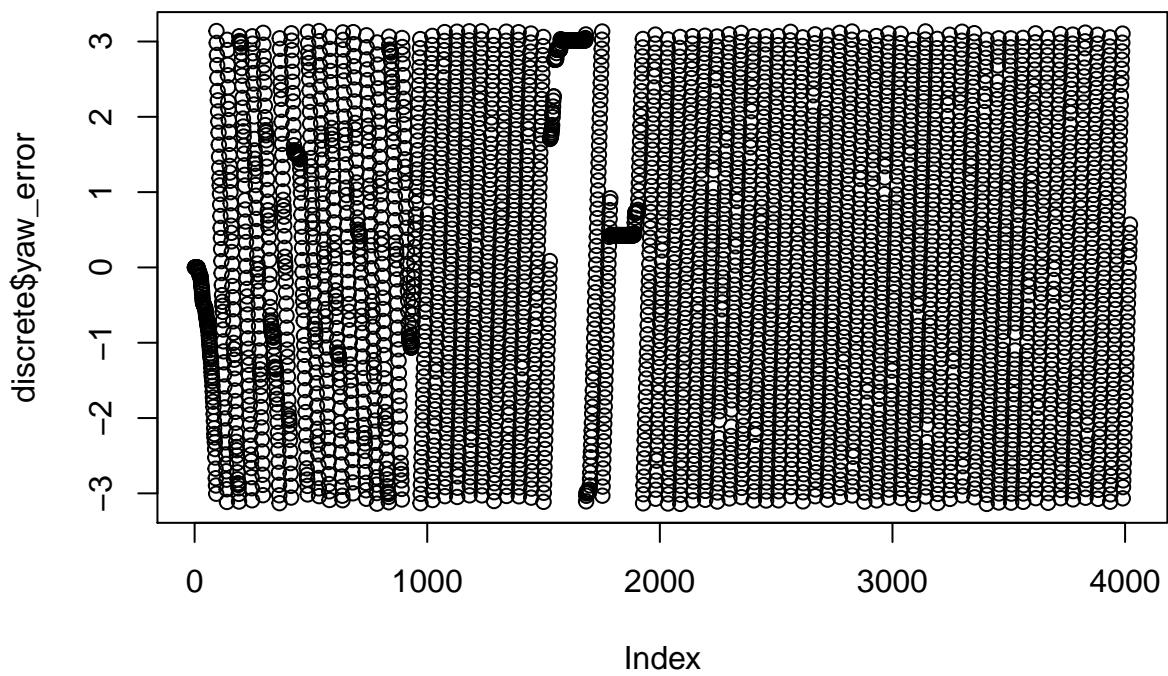
Discrete y_error over time



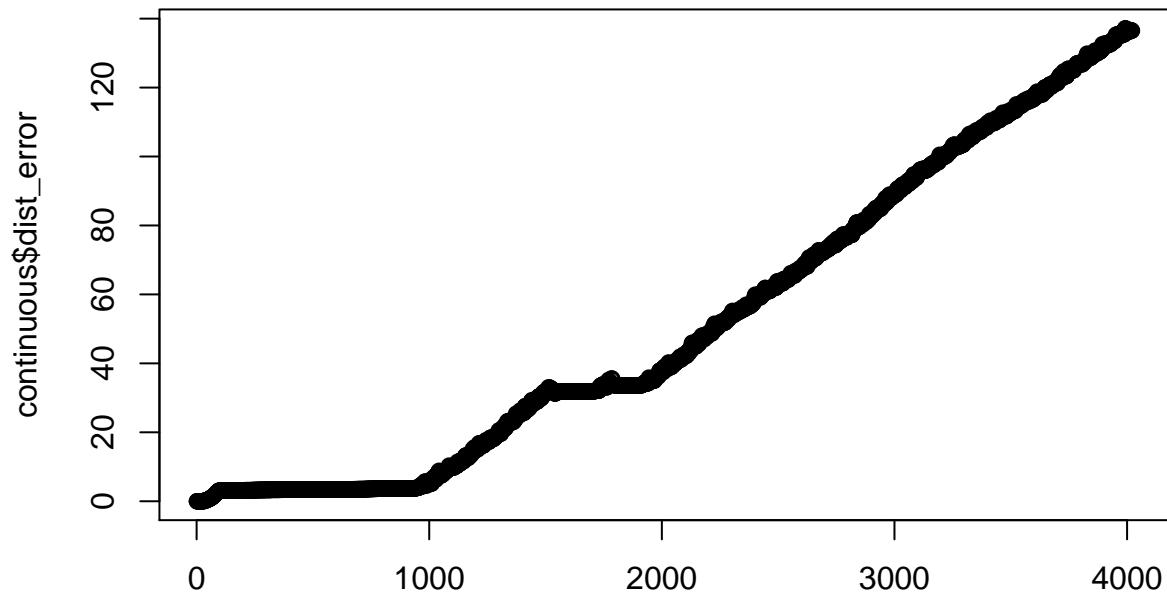
Continuous yaw error over time



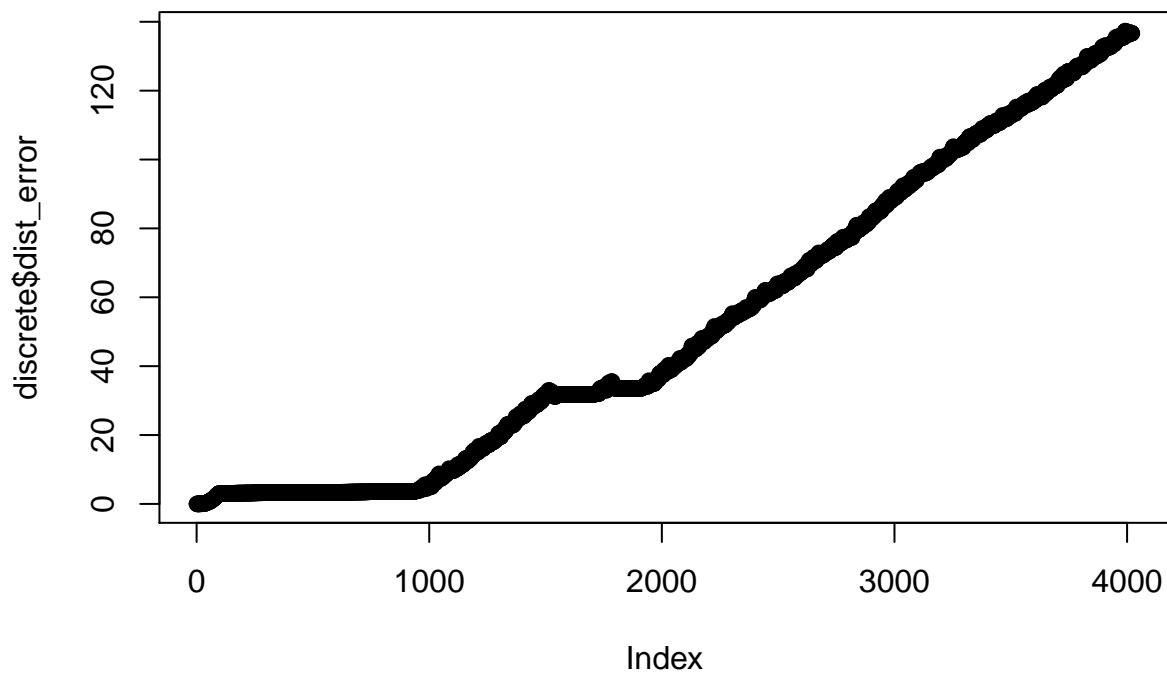
Discrete yaw error over time



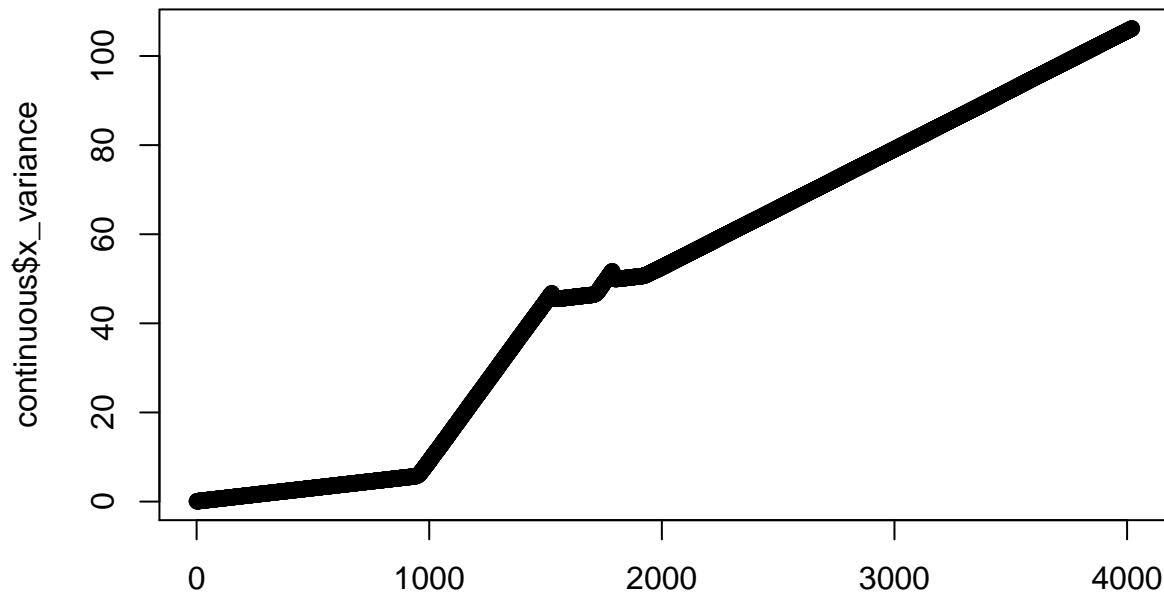
Continuous total distance error over time



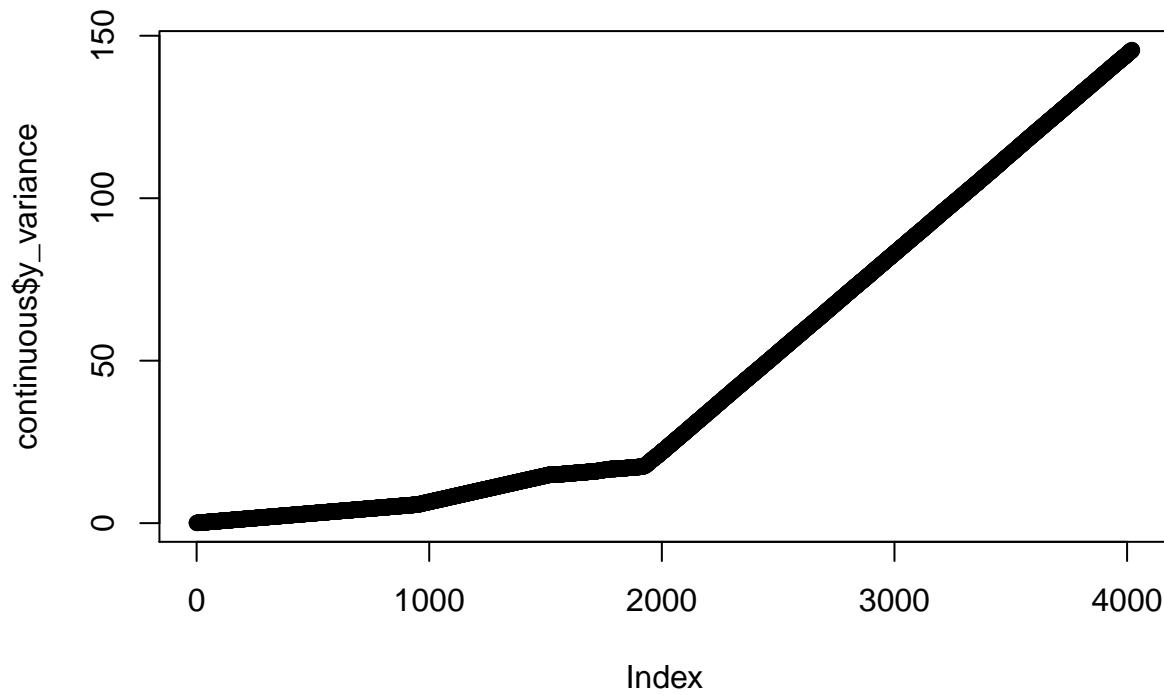
Discrete total distance error over time



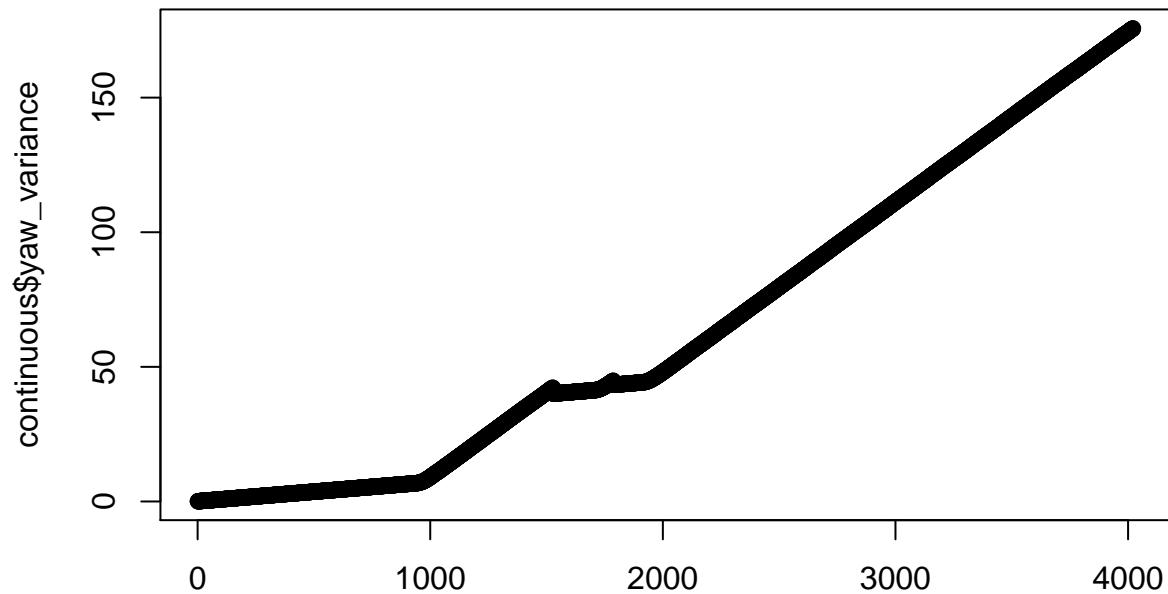
Continuous Filter X Variance Over Time



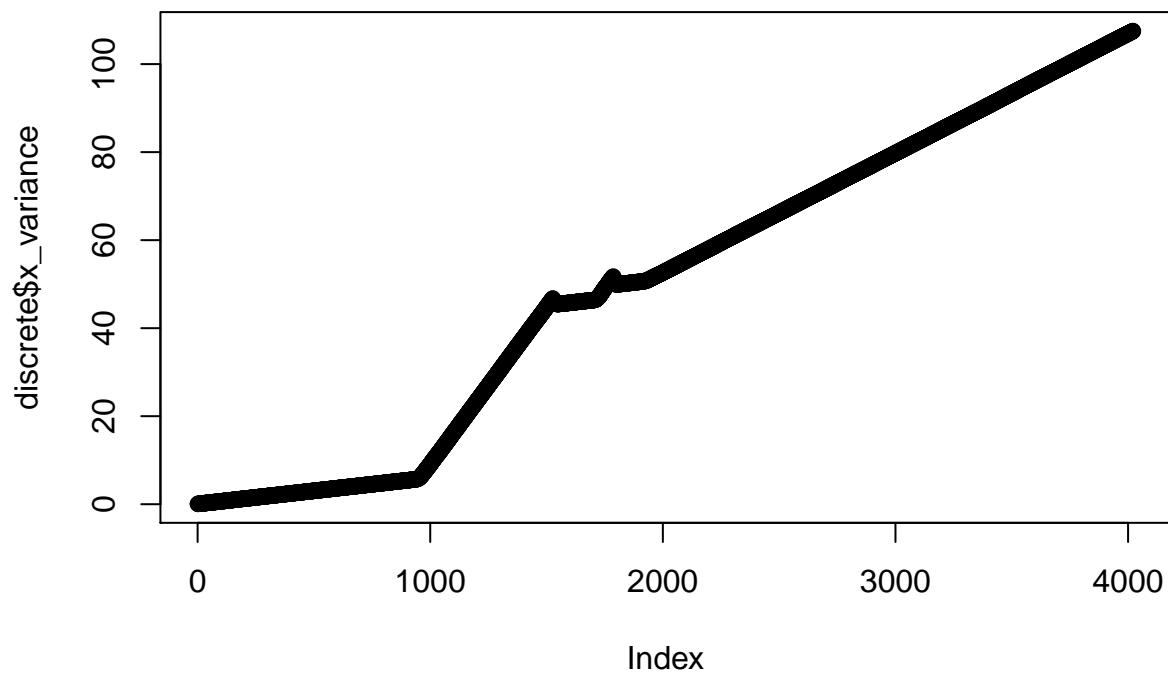
Continuous Filter Y Variance Over Time



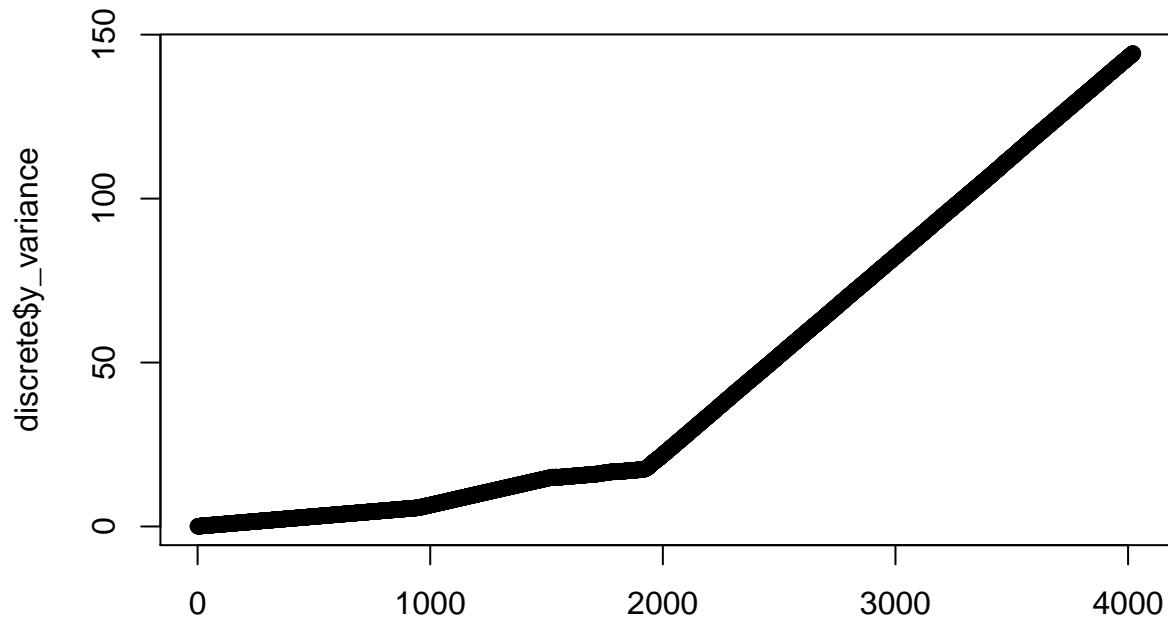
Continuous Filter Yaw Variance Over Time



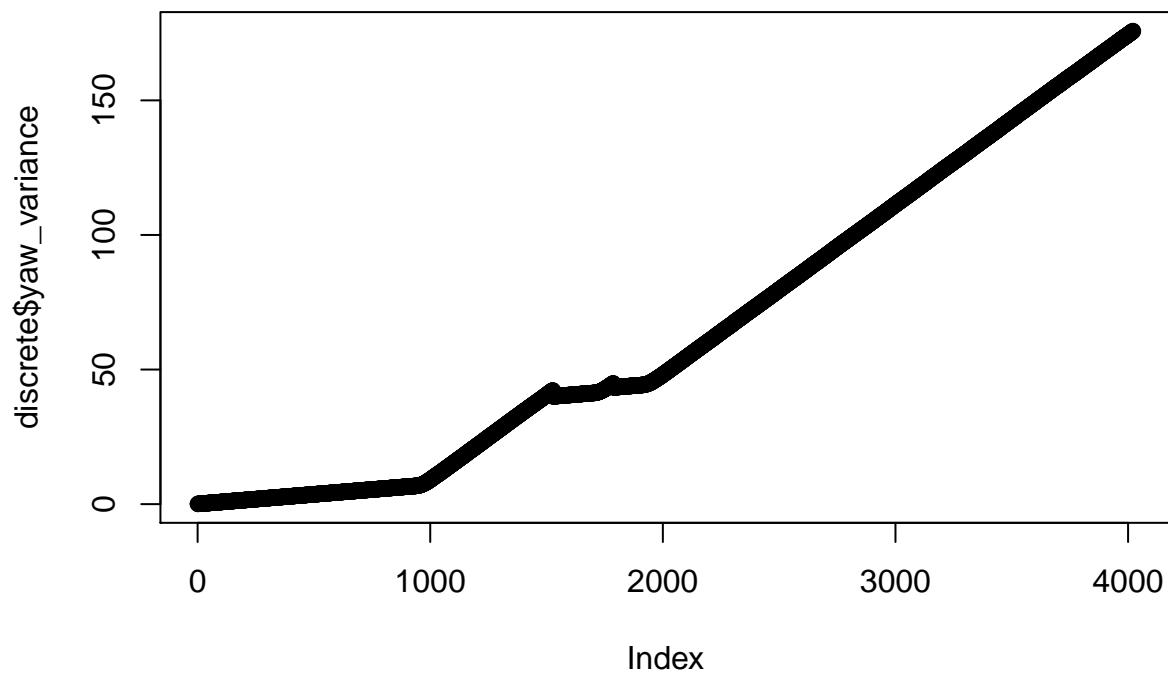
Discrete Filter X Variance Over Time



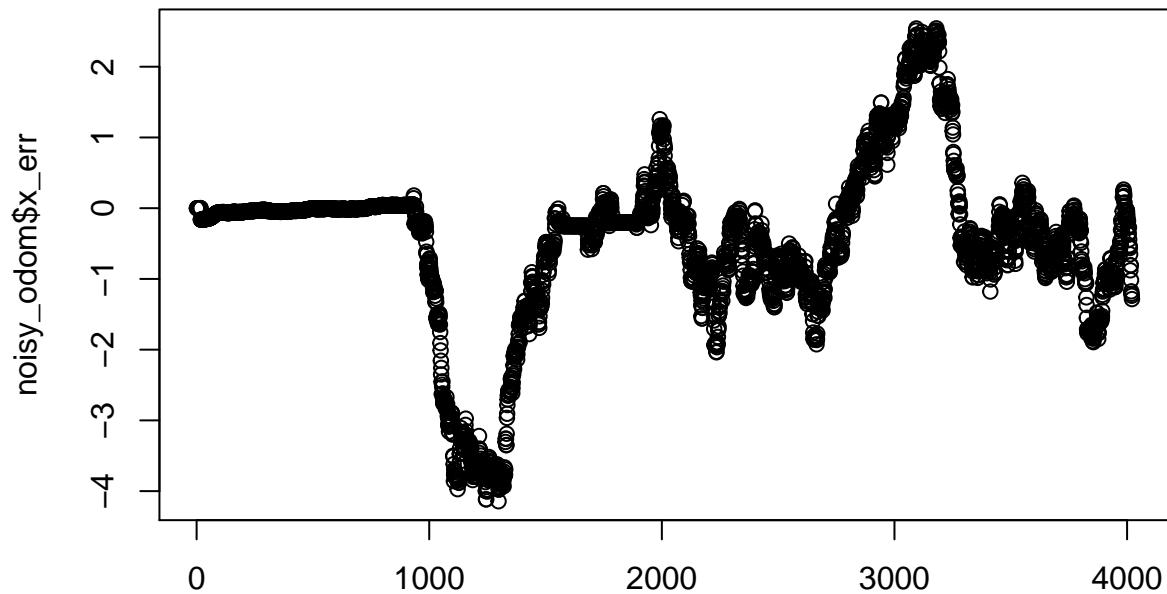
Discrete Filter Y Variance Over Time



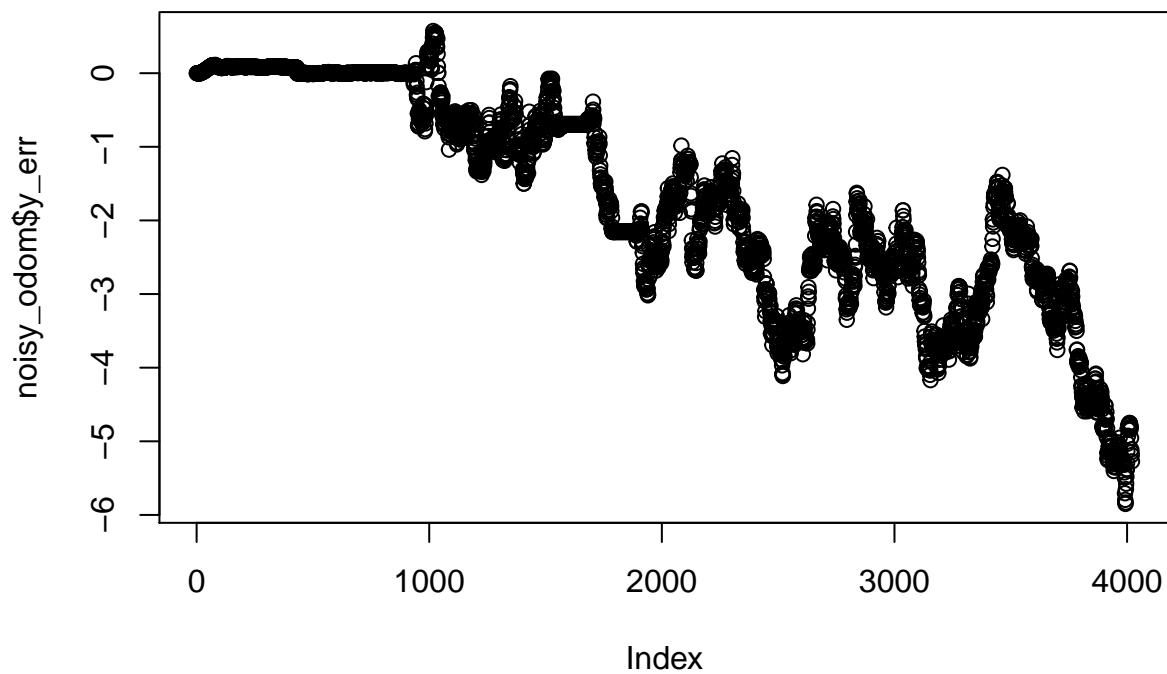
Discrete Filter Yaw Variance Over Time



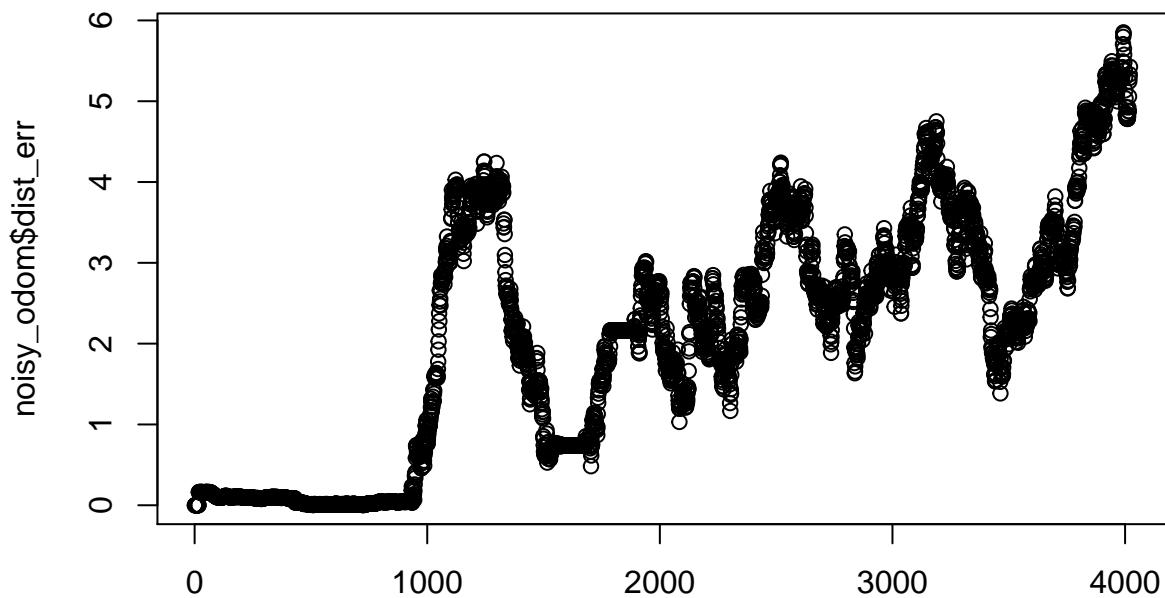
Noisy Odom X Error Over Time



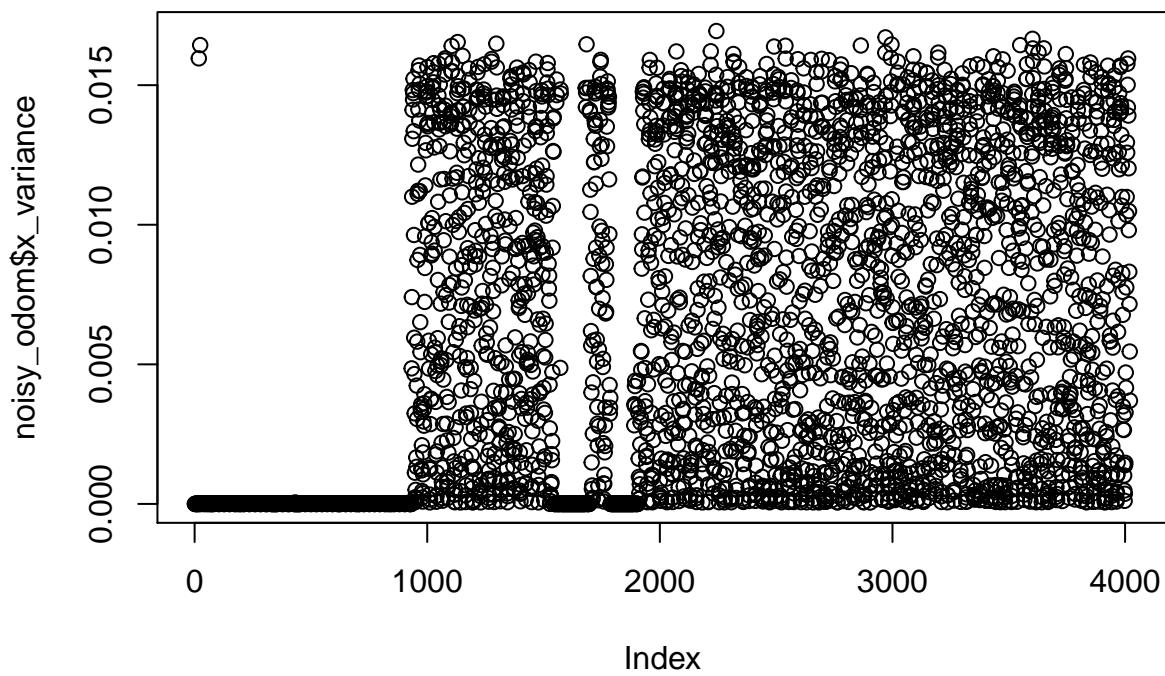
Noisy Odom Y Error Over Time



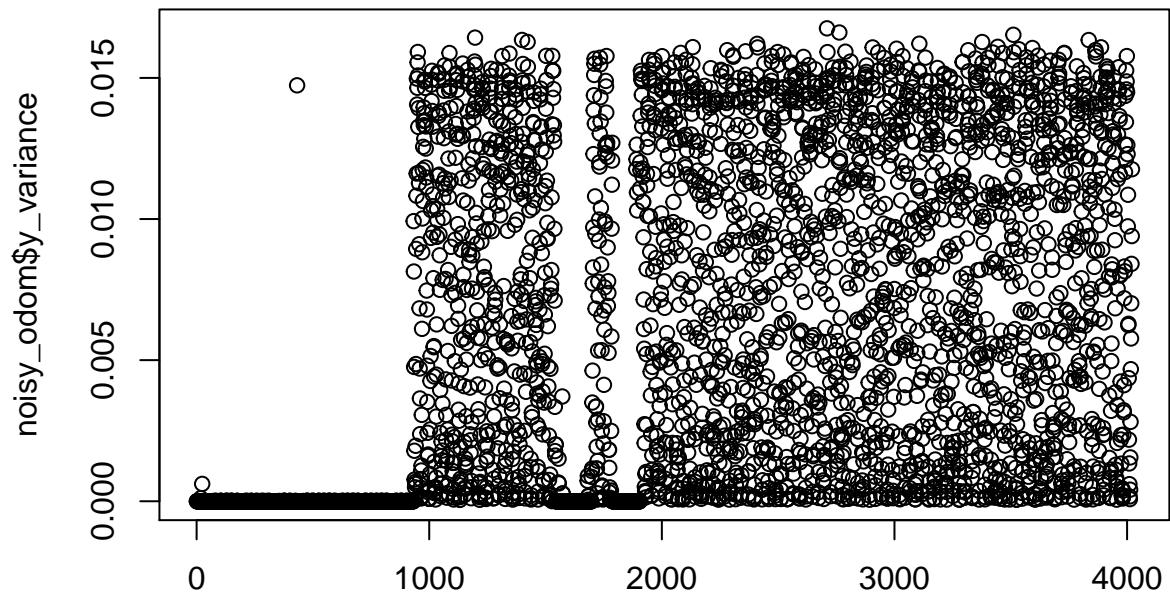
Noisy Odom Horizontal Distance Error Over Time



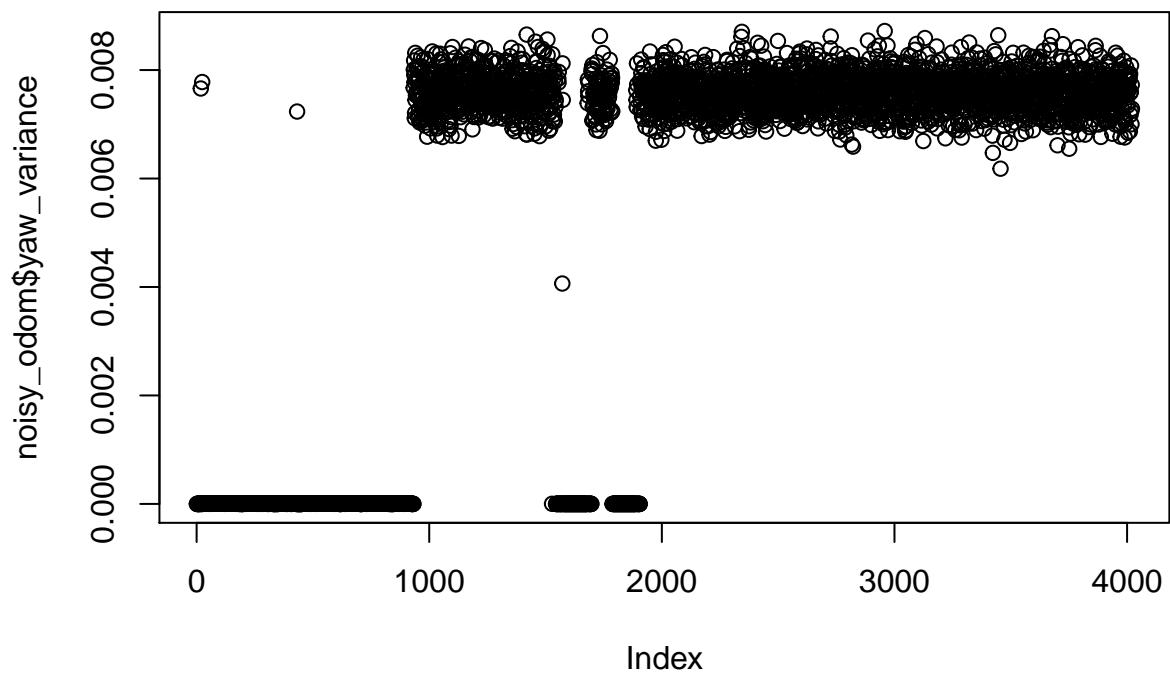
Variance of X Coordinate in Noisy Odometry



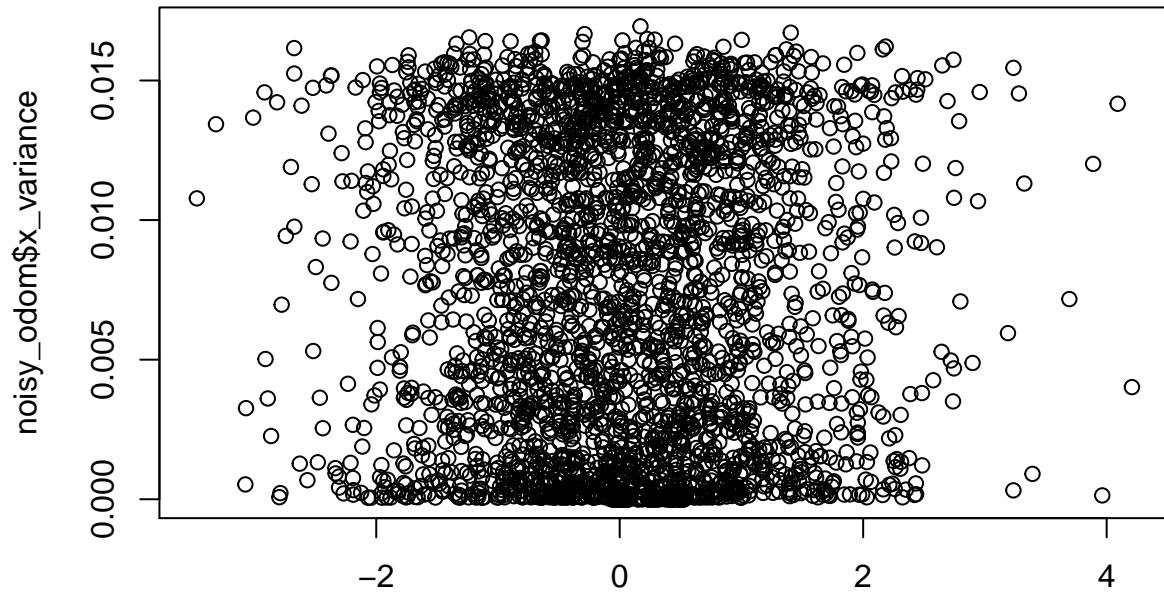
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

