

two_stationary_no_gps Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 13 minutes, and 29 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.
## 1.435e-05 2.075e-03 4.116e-03 4.118e-03 6.168e-03 8.212e-03

summary(continuous$y_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 6.780e-10 1.508e-06 5.183e-06 6.905e-06 1.143e-05 2.070e-05

summary(continuous$yaw_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 4.536e-05 1.406e-03 2.374e-03 2.528e-03 3.818e-03 5.261e-03

summary(continuous$dist_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 1.435e-05 2.075e-03 4.116e-03 4.118e-03 6.168e-03 8.212e-03

summary(discrete$x_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 1.435e-05 2.075e-03 4.116e-03 4.118e-03 6.168e-03 8.212e-03

summary(discrete$y_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 6.780e-10 1.508e-06 5.183e-06 6.905e-06 1.143e-05 2.070e-05

summary(discrete$yaw_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 4.536e-05 1.406e-03 2.374e-03 2.528e-03 3.818e-03 5.261e-03

summary(discrete$dist_error)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 1.435e-05 2.075e-03 4.116e-03 4.118e-03 6.168e-03 8.212e-03

summary(noisy_odom$x_err)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 3.647e-05 4.243e-05 4.520e-05 4.588e-05 4.905e-05 5.747e-05
```

```

summary(noisy_odom$y_err)

##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## -4.536e-08 -2.975e-08 -2.400e-08 -9.017e-09  6.885e-09  9.059e-08

summary(noisy_odom$dist_err)

##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## 3.647e-05 4.243e-05 4.520e-05 4.588e-05 4.905e-05 5.747e-05

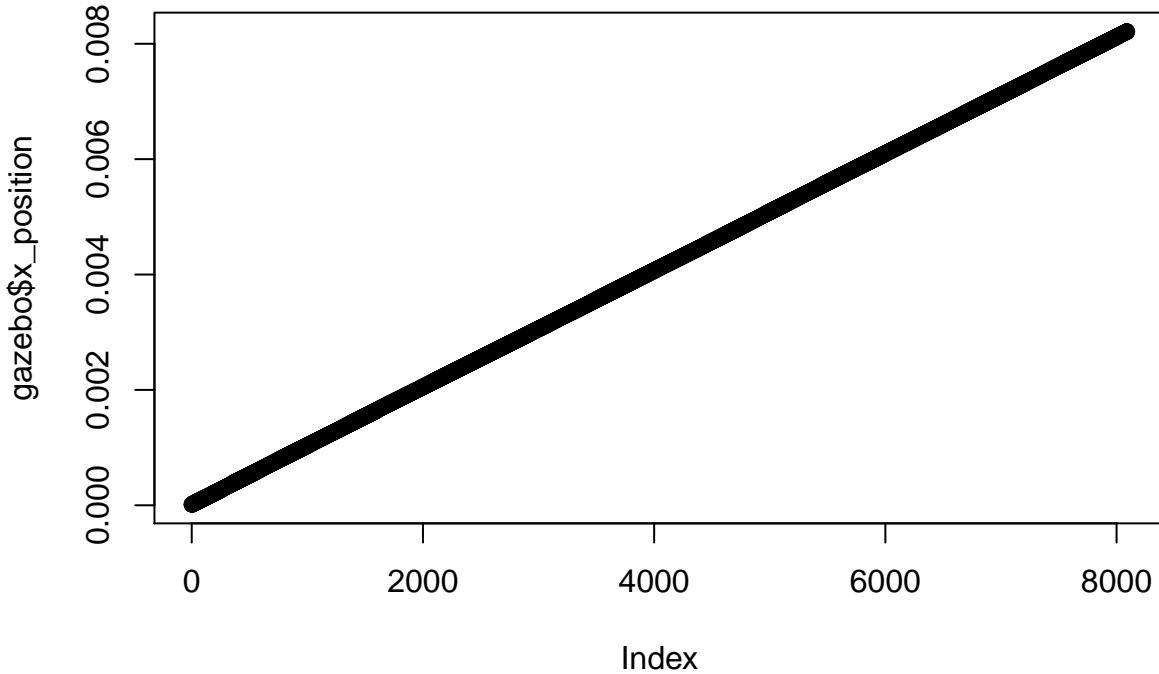
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

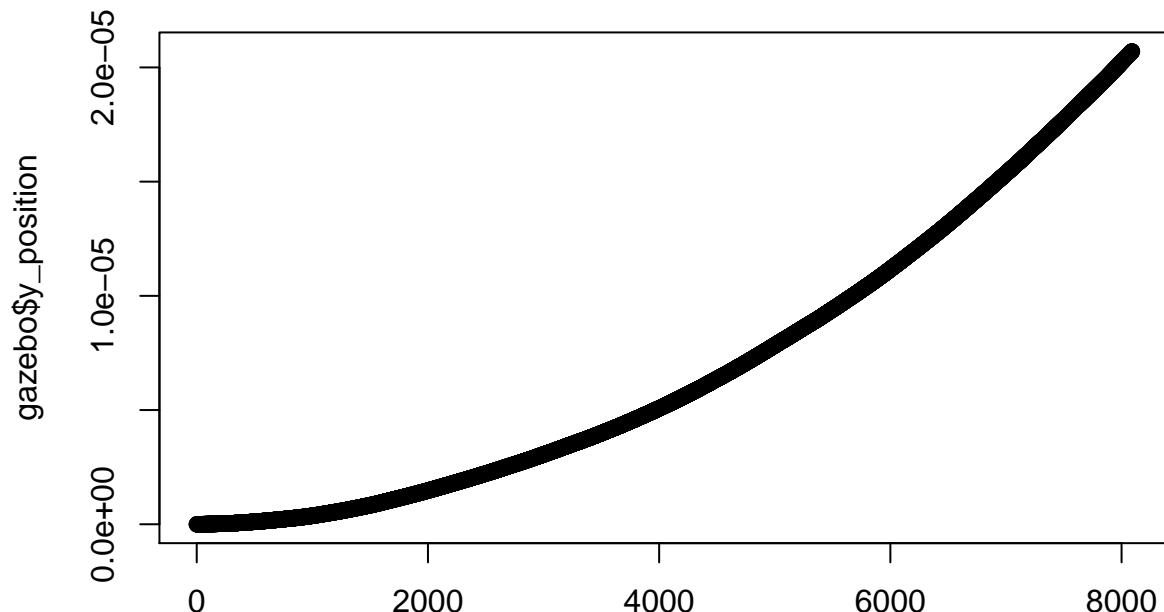
##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## 6.273e-16 8.766e-15 1.827e-14 2.396e-14 3.271e-14 2.329e-13

```

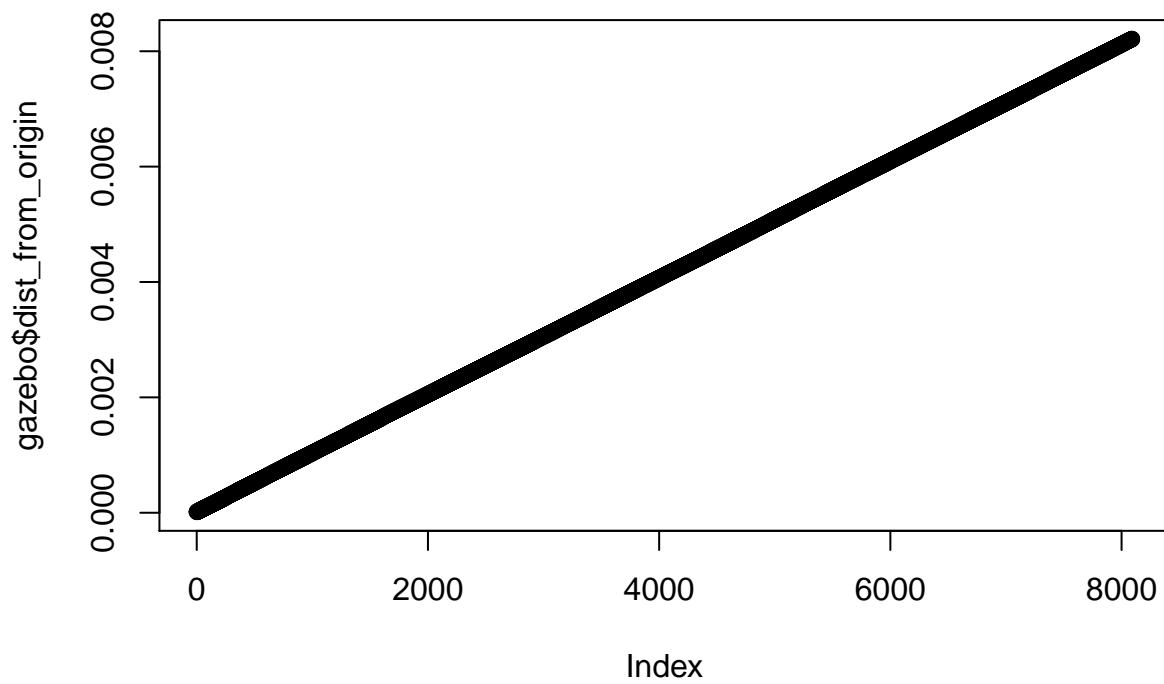
X coordinate of robot over time



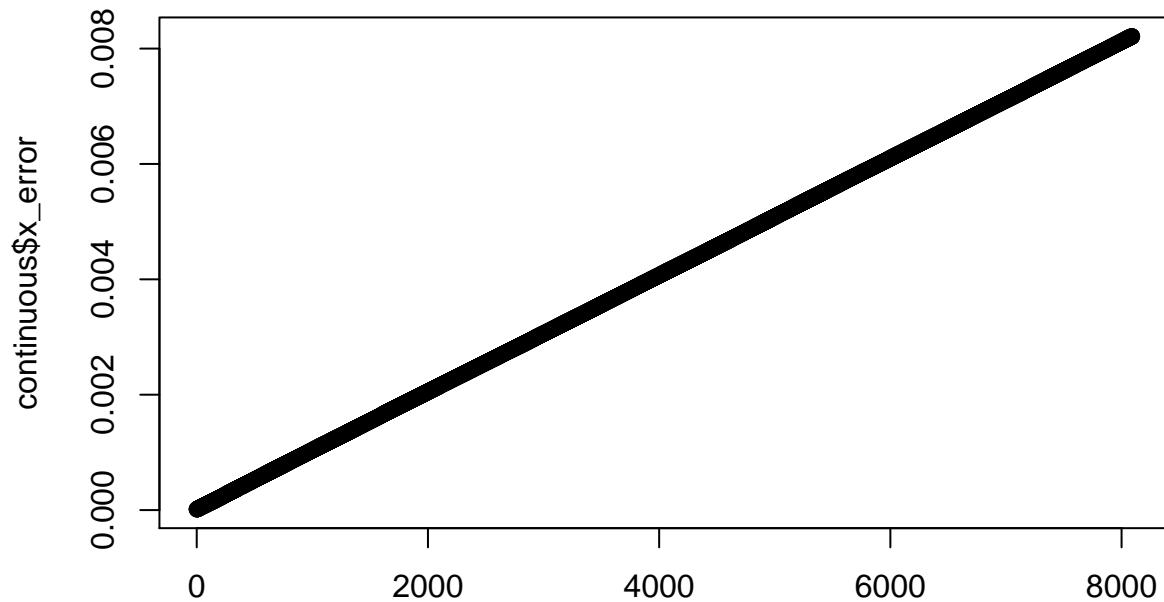
Y coordinate of robot over time



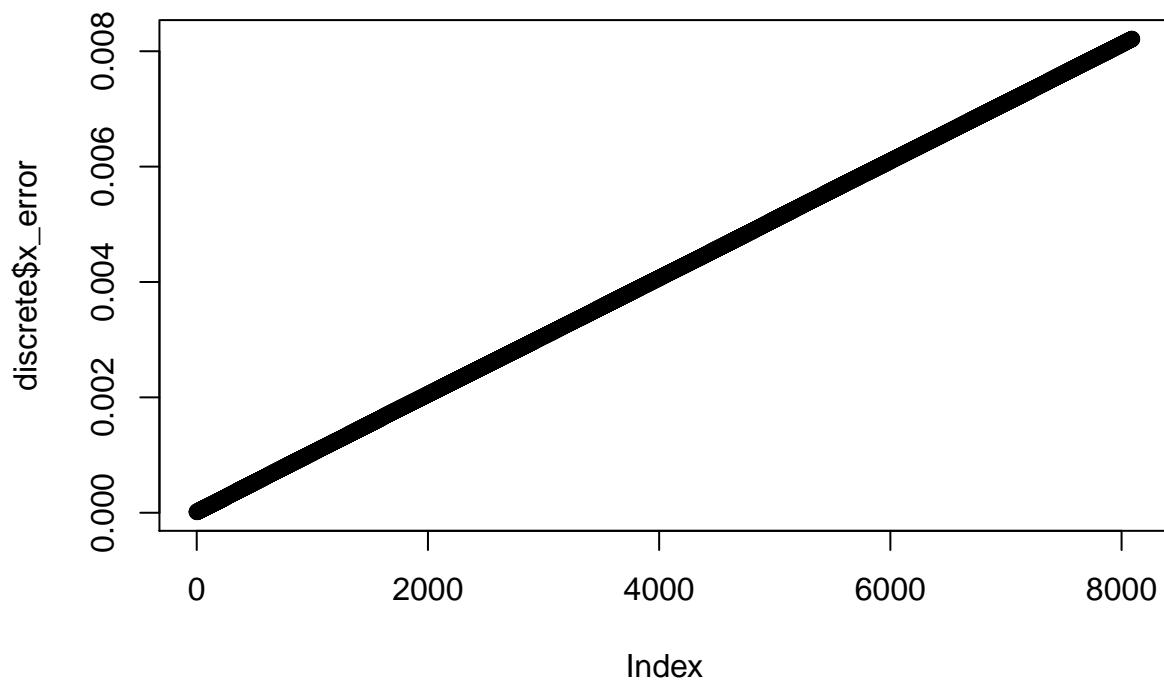
Distance from origin vs. time^{Index}



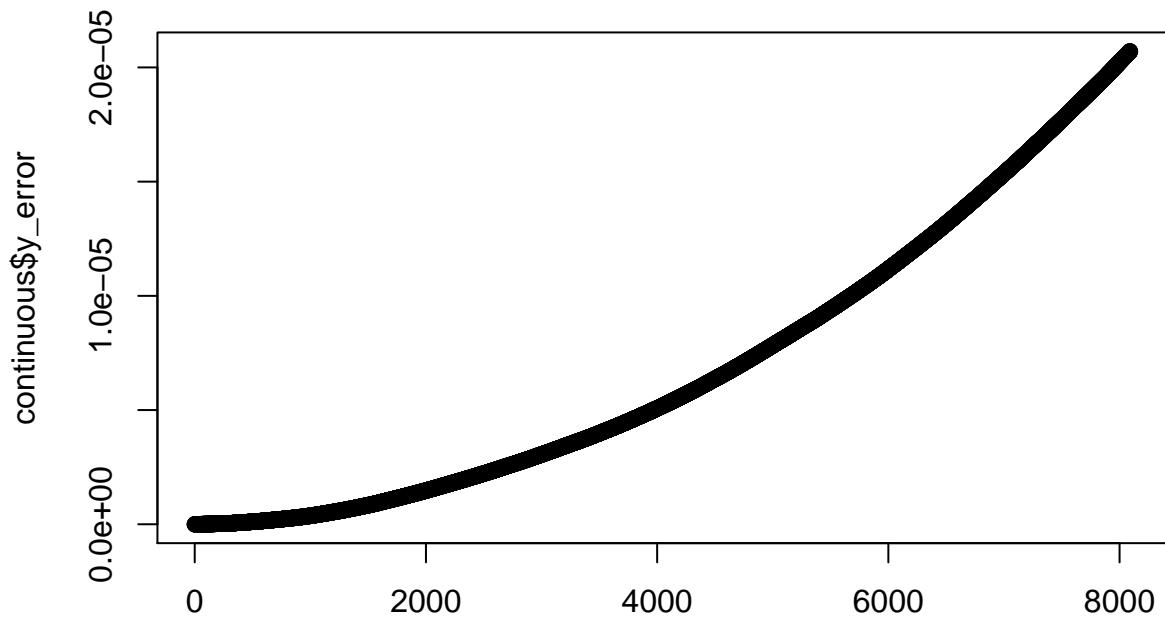
Continuous x_error over time



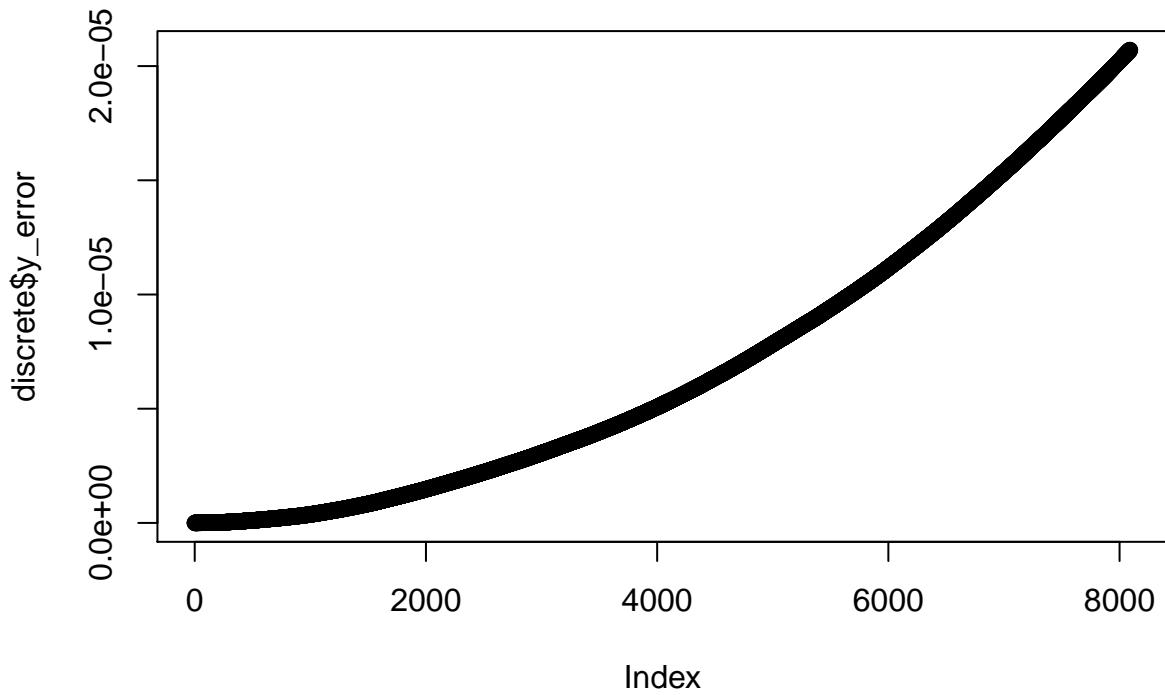
Discrete x_error over time



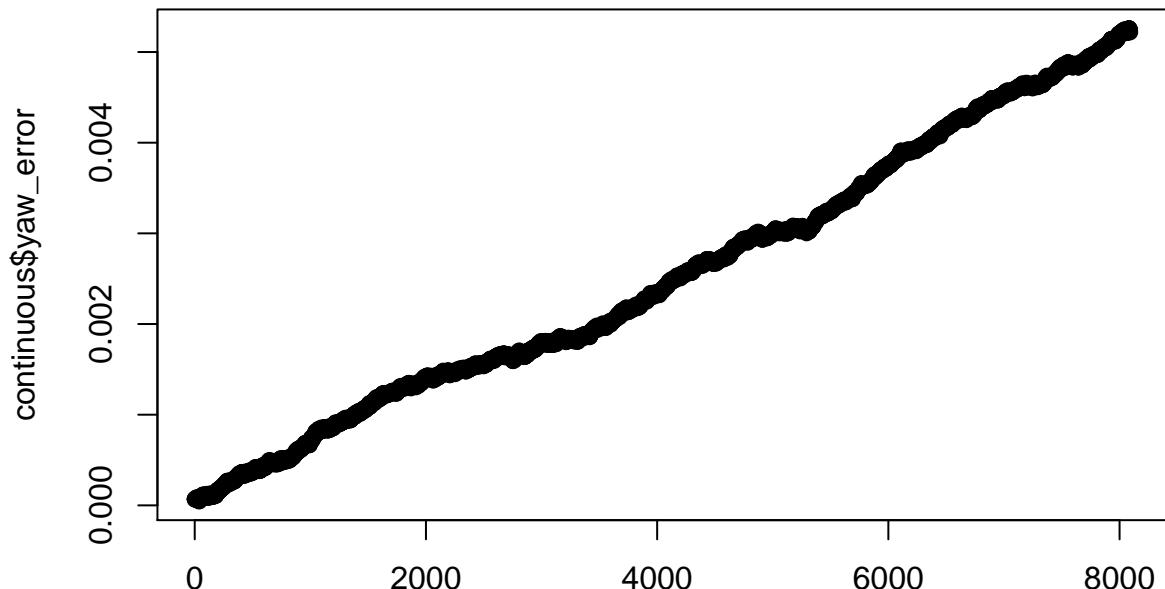
Continuous y_error over time



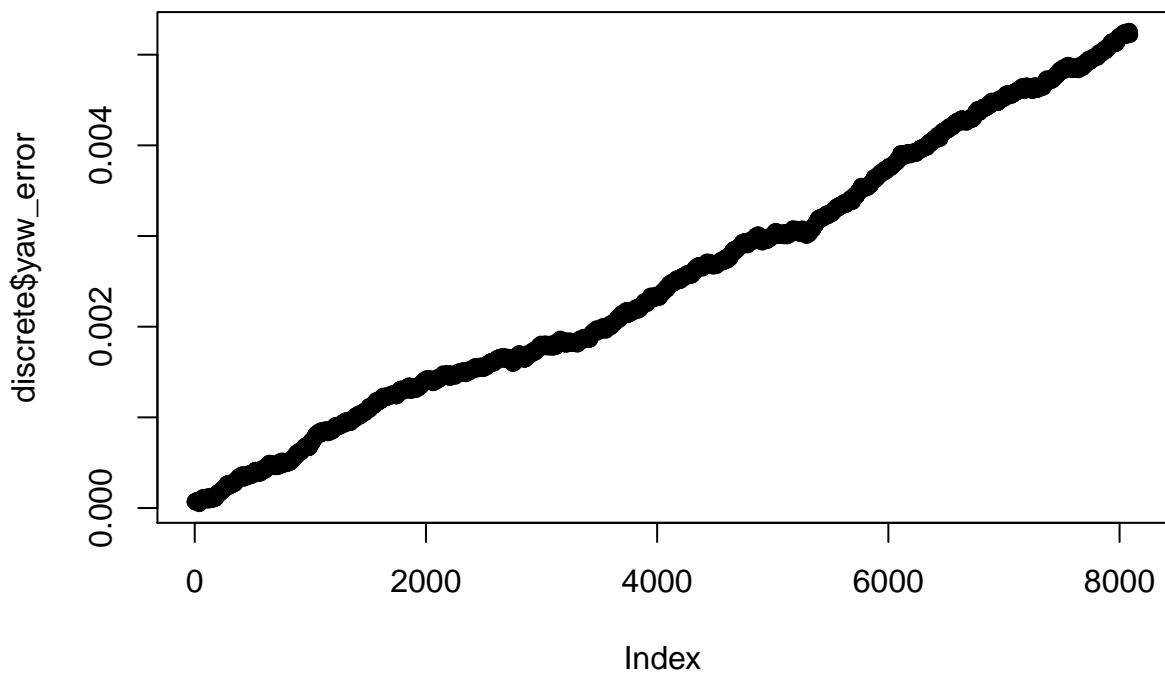
Discrete y_error over time



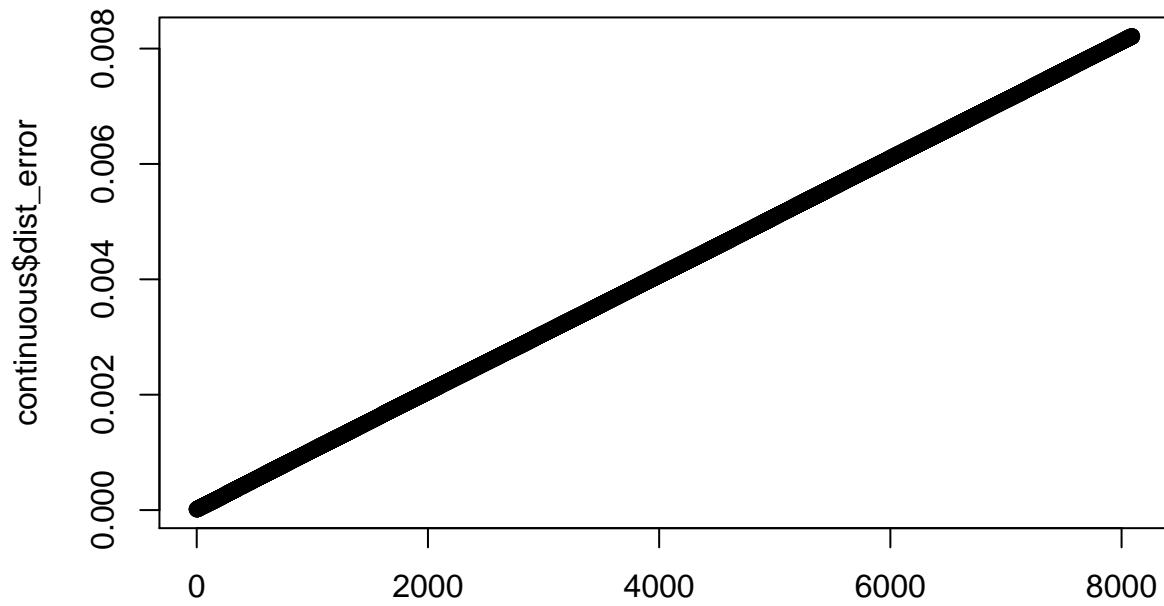
Continuous yaw error over time



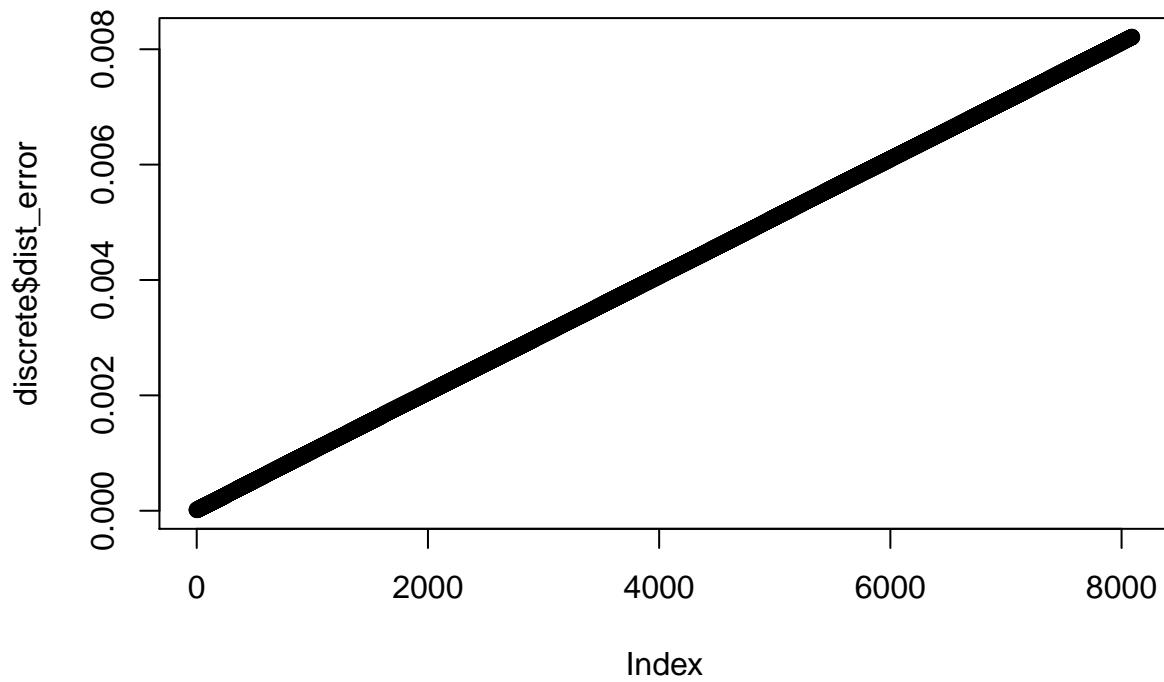
Discrete yaw error over time



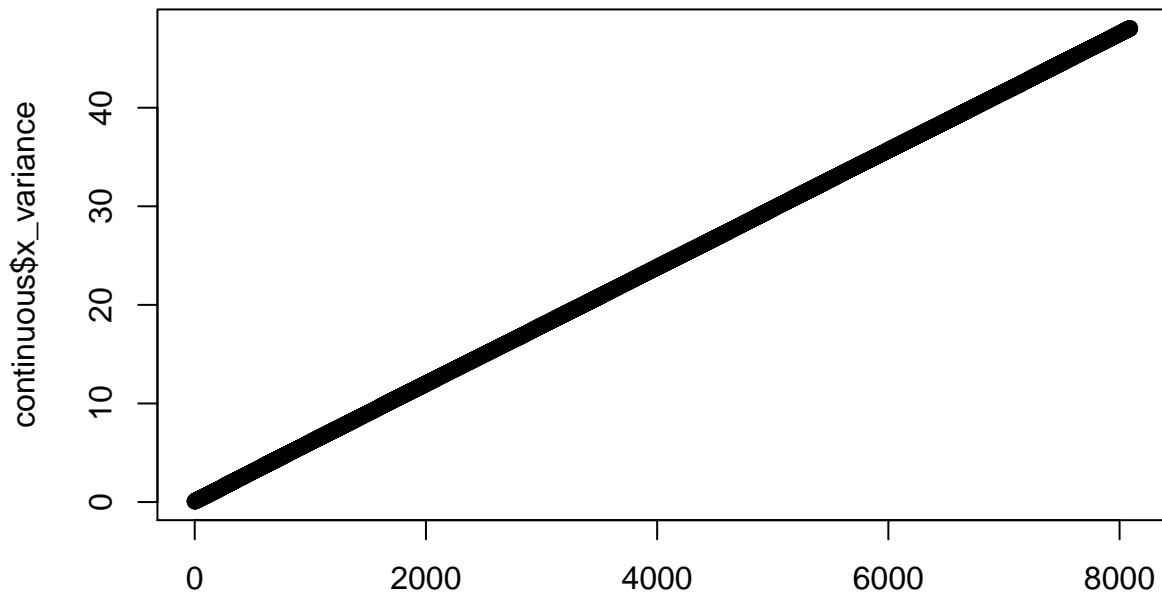
Continuous total distance error over time



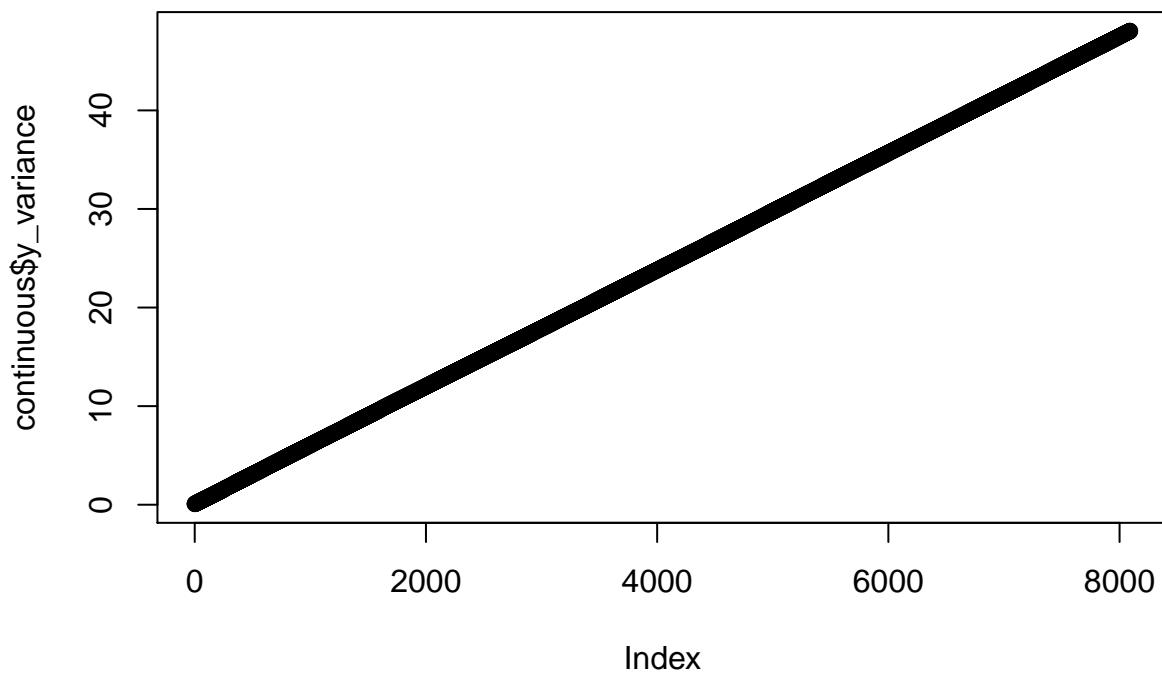
Discrete total distance error over time



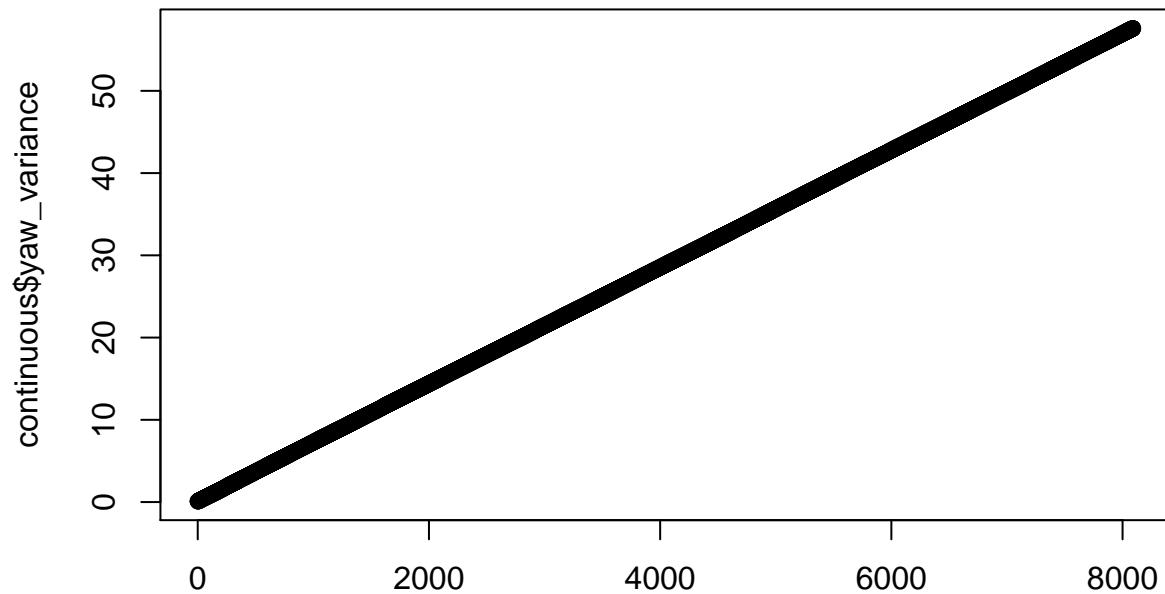
Continuous Filter X Variance Over Time



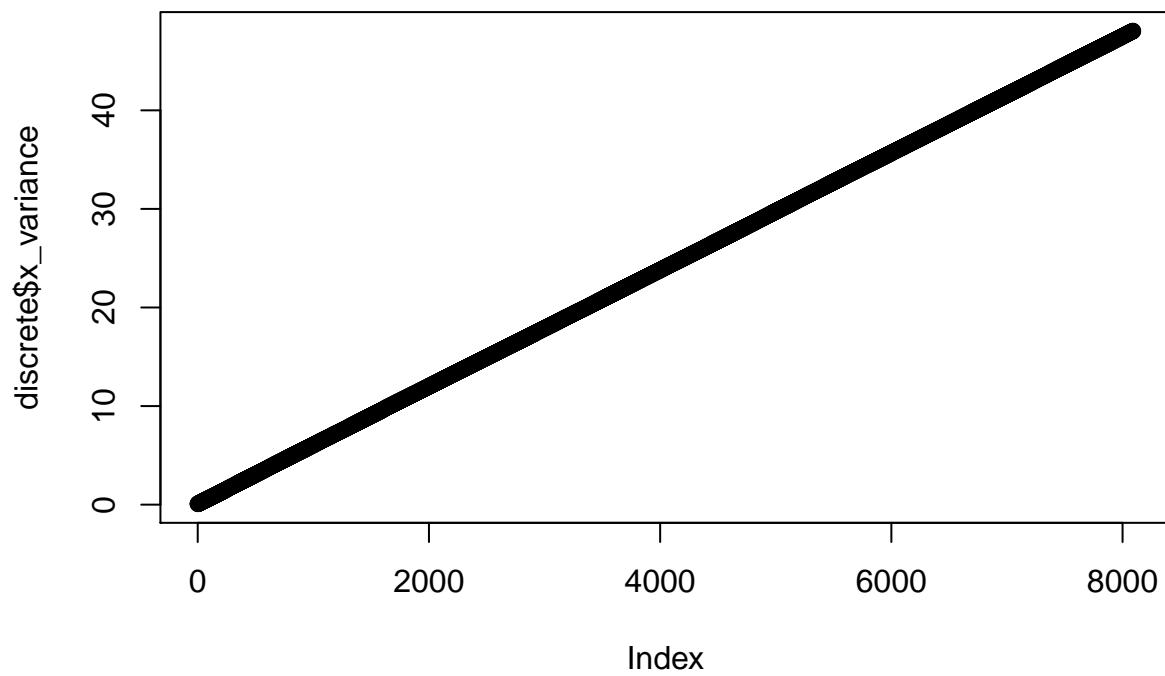
Continuous Filter Y Variance Over Time



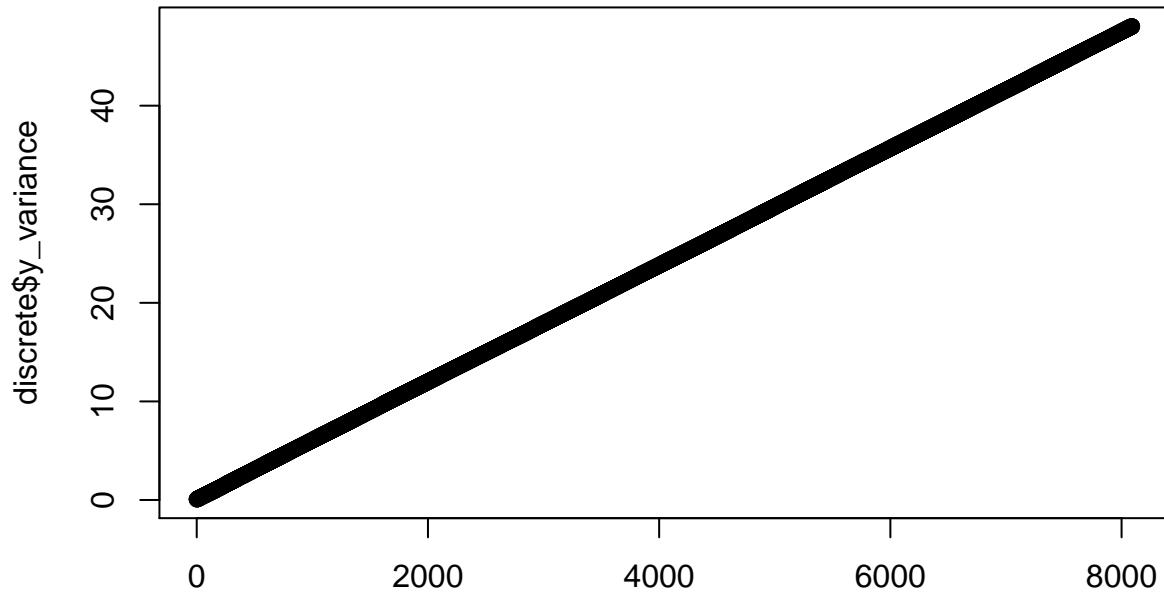
Continuous Filter Yaw Variance Over Time



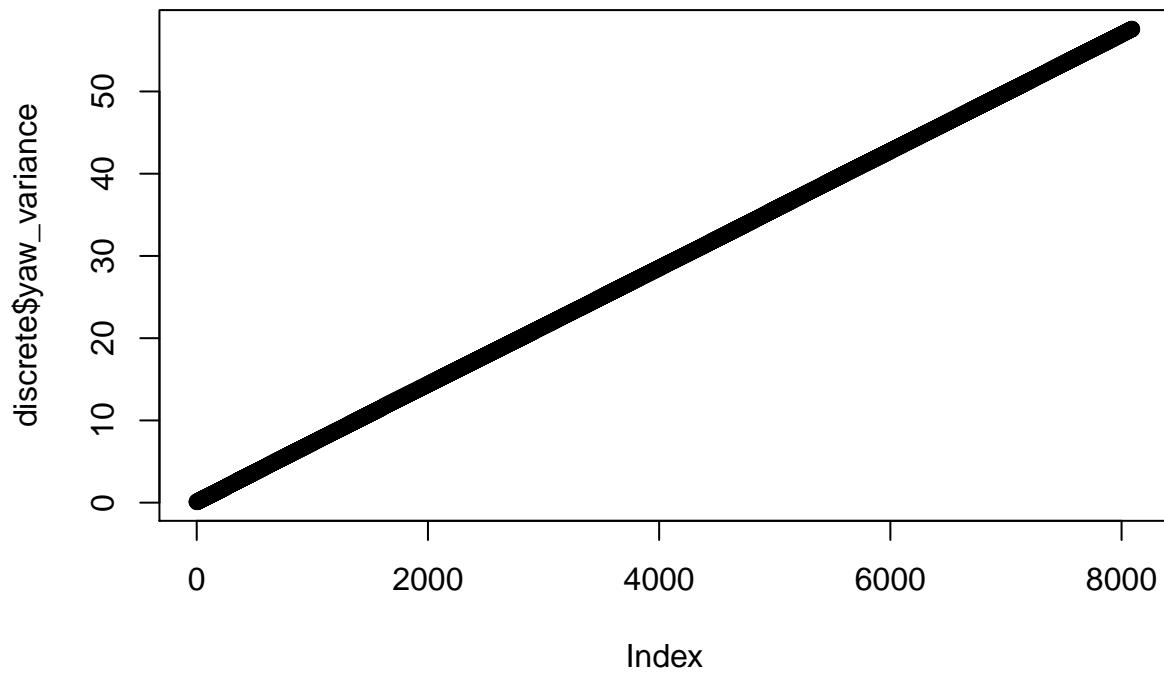
Discrete Filter X Variance Over Time



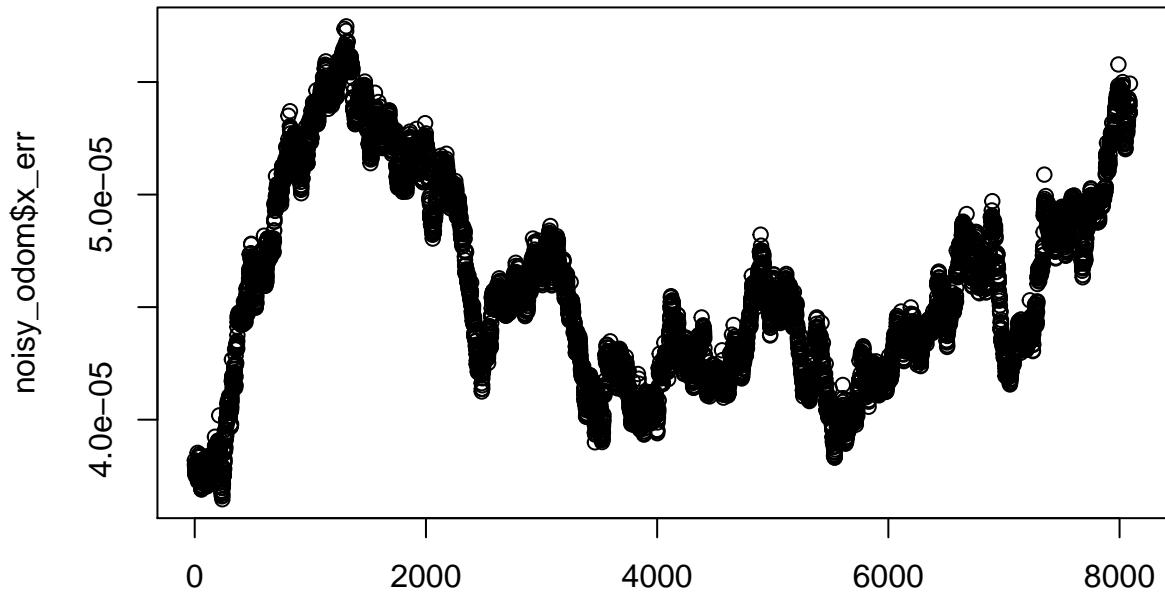
Discrete Filter Y Variance Over Time



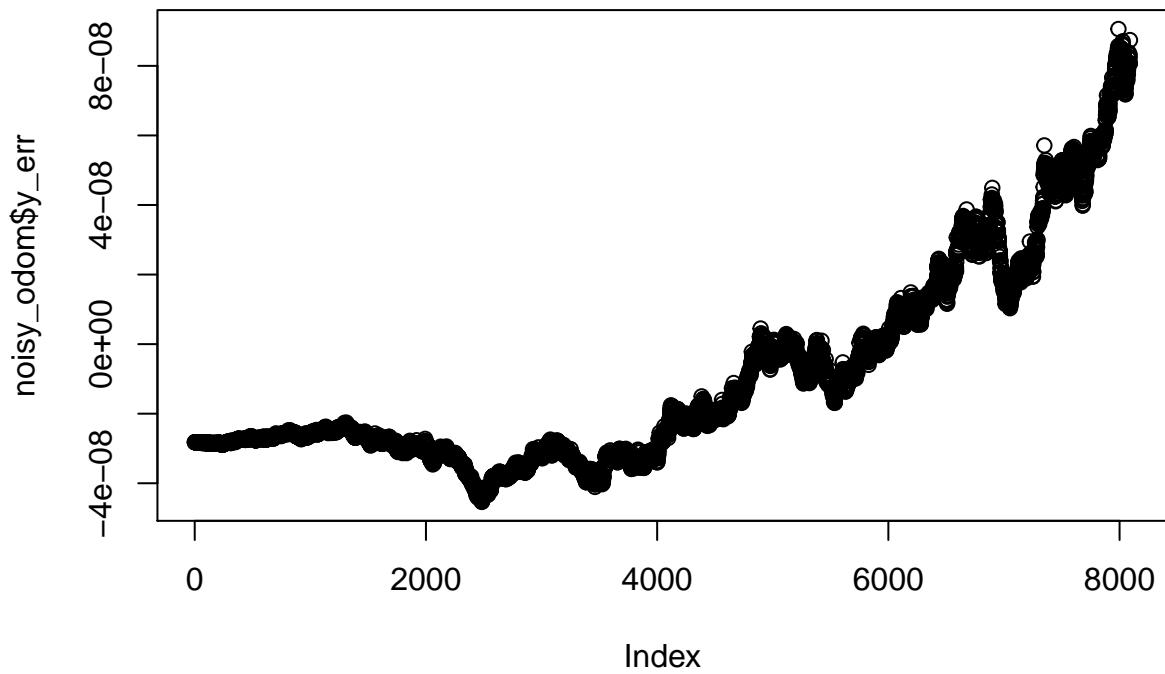
Discrete Filter Yaw Variance Over Time



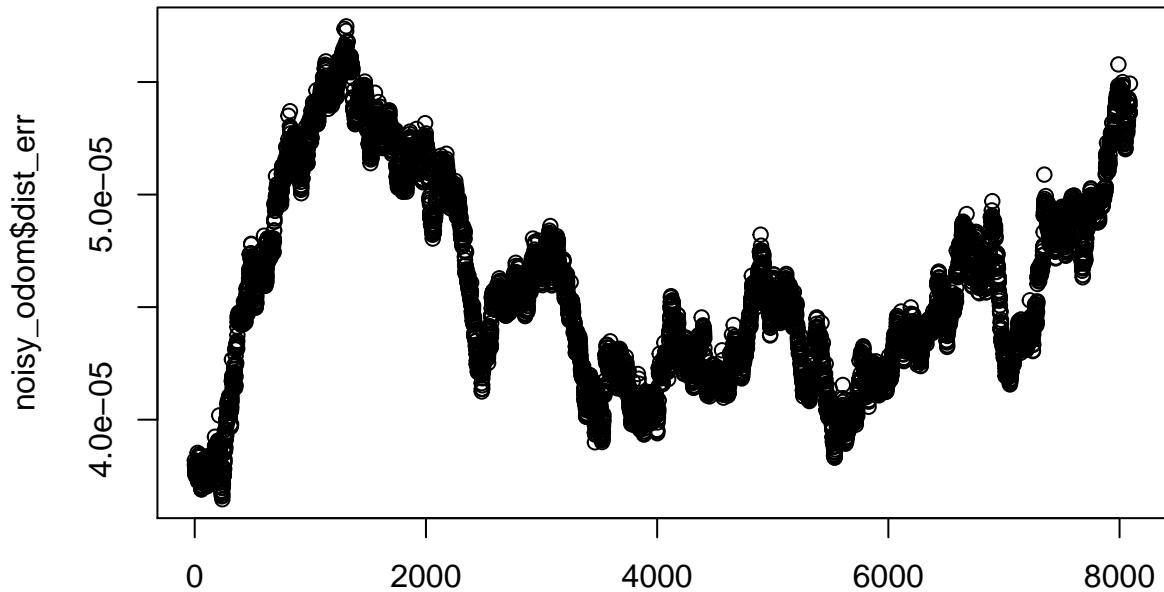
Noisy Odom X Error Over Time



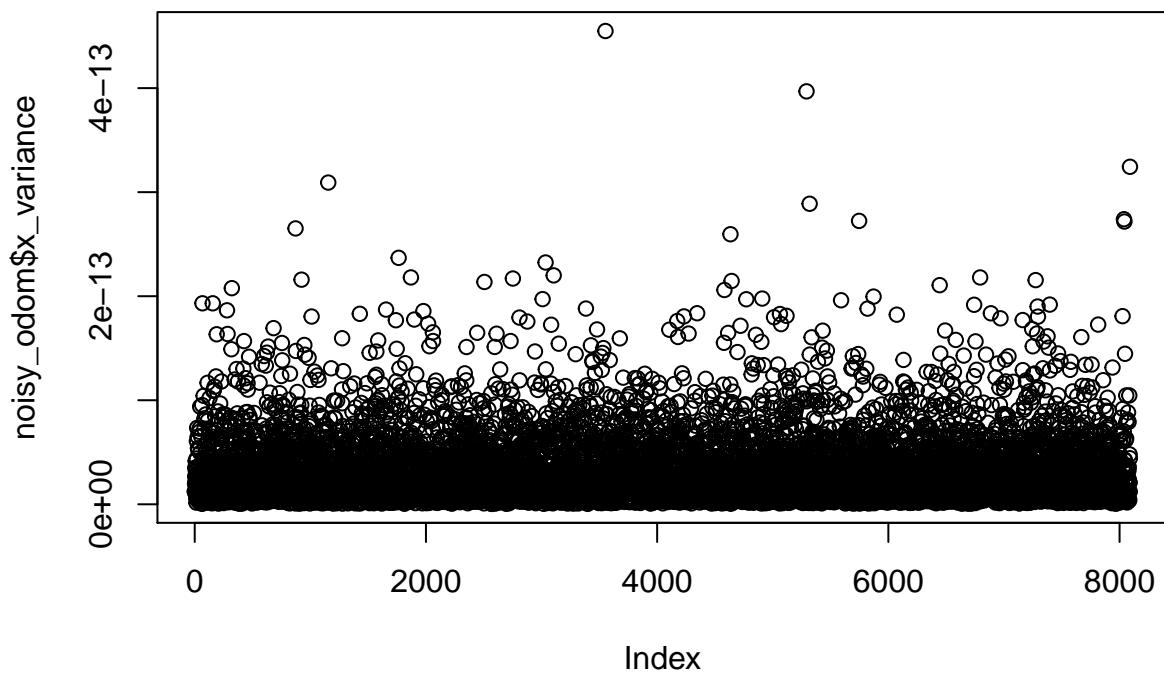
Noisy Odom Y Error Over Time



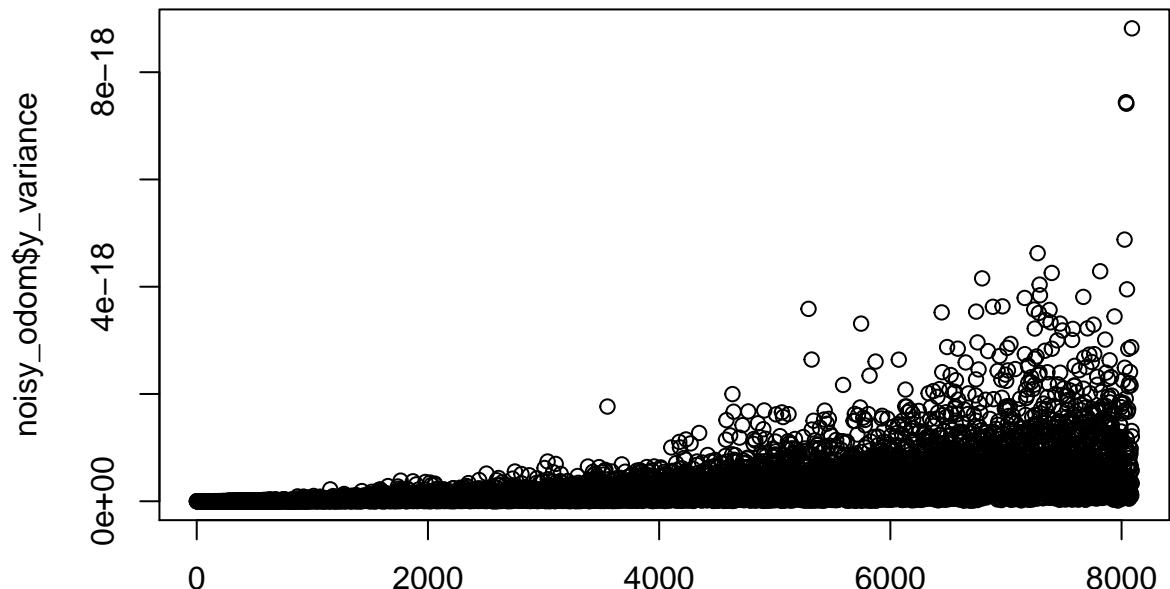
Noisy Odom Horizontal Distance Error Over Time



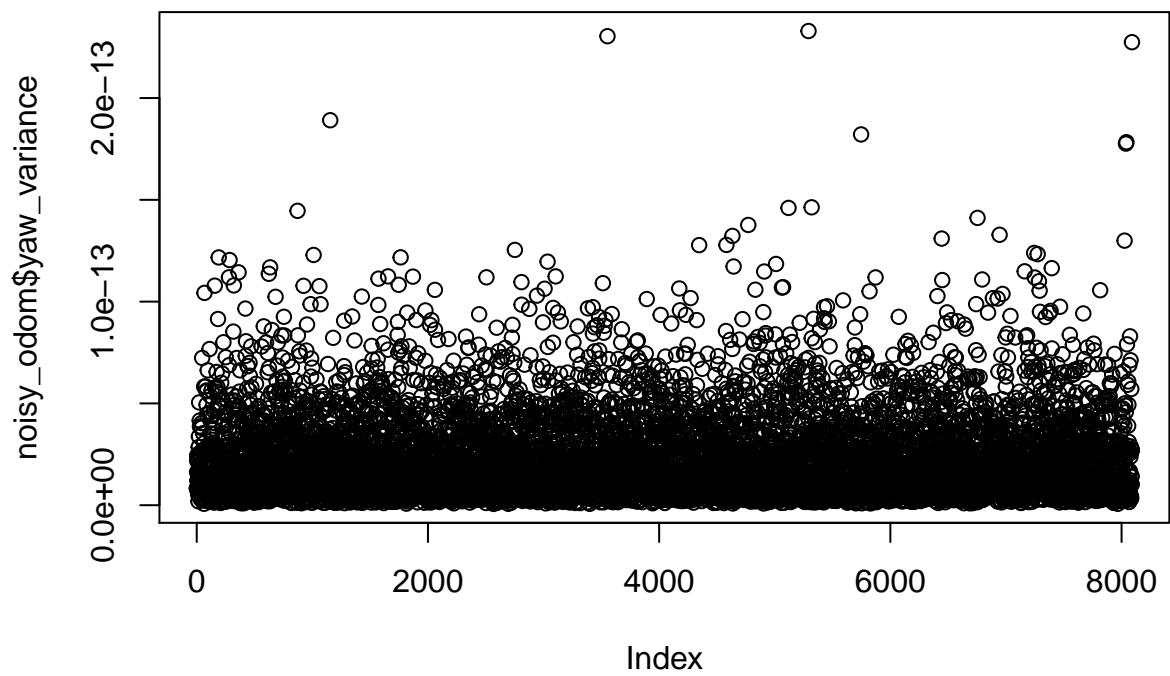
Variance of X Coordinate in Noisy Odometry



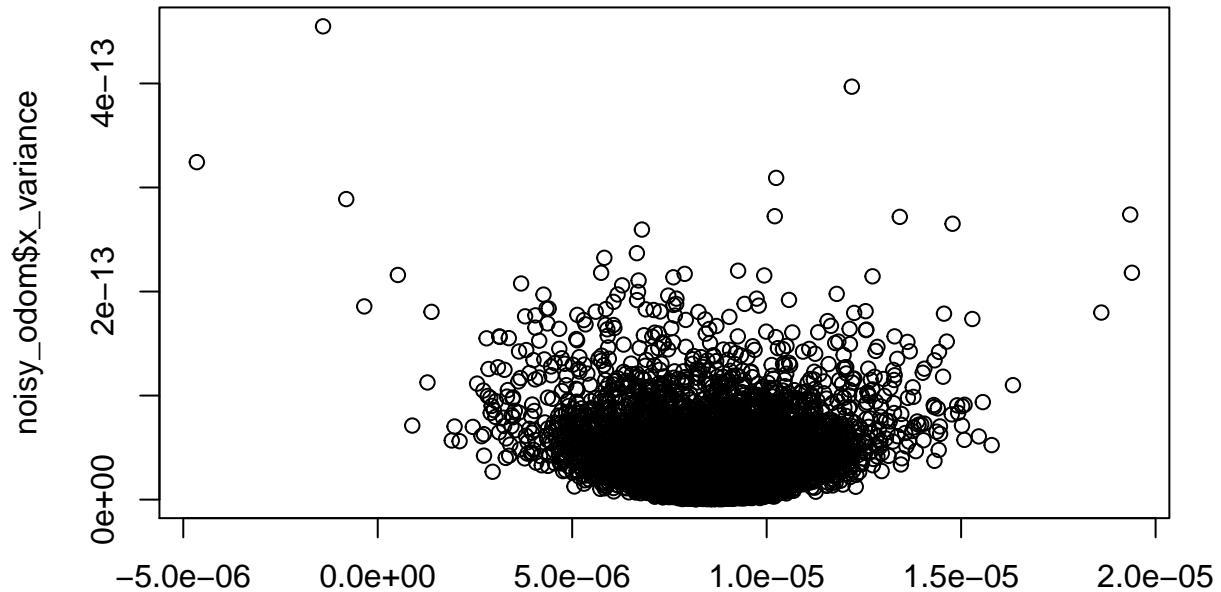
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

