

one_mobile_noiseless Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 25 minutes, and 8.6 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.
## -0.8041  5.1880 14.8000 10.6500 14.8000 15.3500

summary(continuous$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -17.74000 -15.03000 -15.03000 -11.68000 -7.97600  0.03901

summary(continuous$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -3.1410000 -1.5900000  0.0526800 -0.0005787  1.5560000  3.1410000

summary(continuous$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
##  0.000008 10.190000 21.090000 16.030000 21.100000 21.120000

summary(discrete$x_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -4.044000 -0.000032  0.000002 -0.021520  0.000724  5.084000

summary(discrete$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -3.833000 -0.000036  0.000000 -0.007175  0.000487  2.940000

summary(discrete$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -3.1400 -1.1940  0.1835  0.1155  1.5310  3.1390

summary(discrete$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
##  0.000001 0.000028 0.000055 0.241100 0.196900 5.122000

summary(noisy_odom$x_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -19.1000 -14.3000 -7.9400 -9.0740 -4.5240  0.1538
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -23.170 -16.630 -14.380 -11.530 -4.658  3.696

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000013 7.508000 17.210000 15.170000 21.890000 28.190000

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

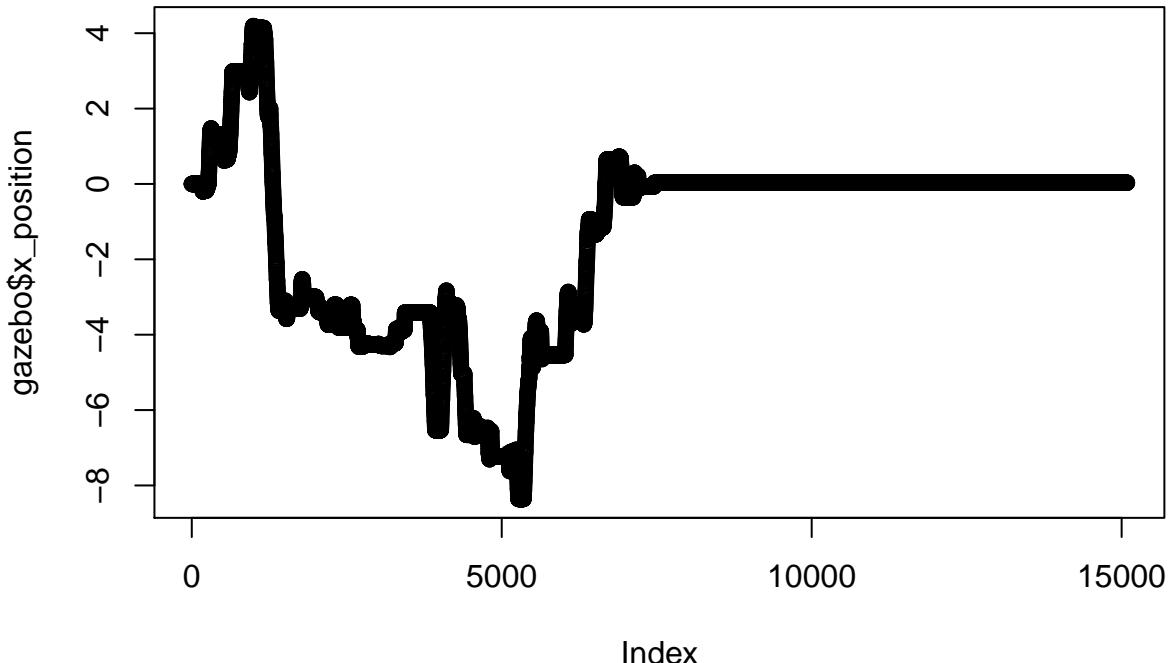
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000038 3.173000 3.173000 4.107000 5.075000 8.410000

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

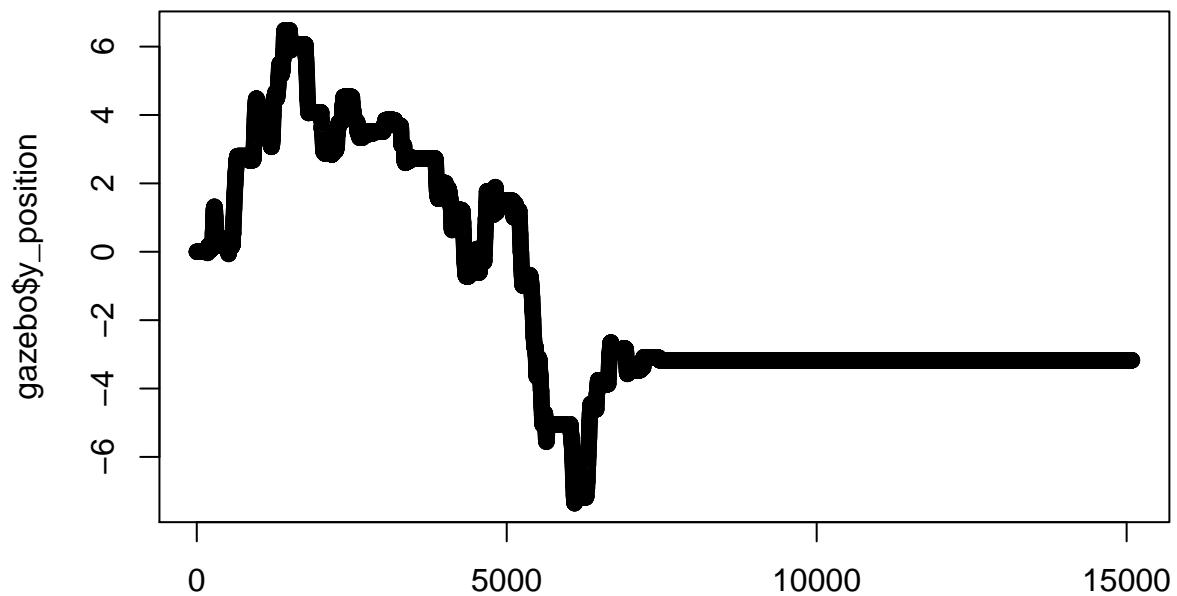
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000e+00 4.724e-06 7.309e-03 4.787e-03 7.674e-03 8.855e-03

```

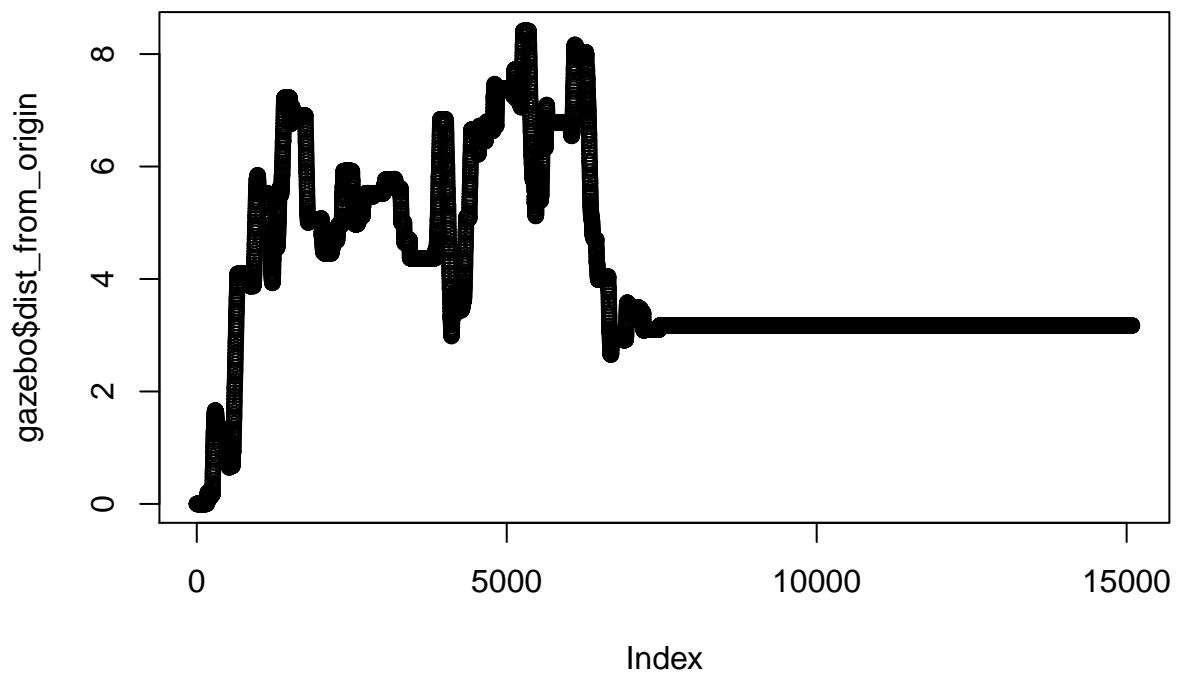
X coordinate of robot over time



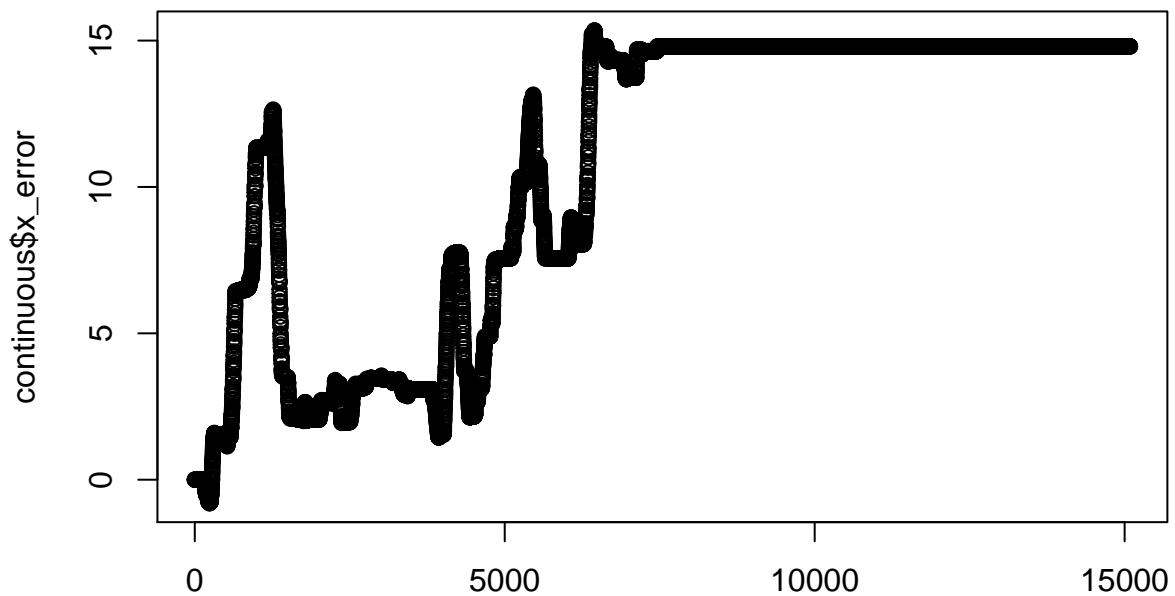
Y coordinate of robot over time



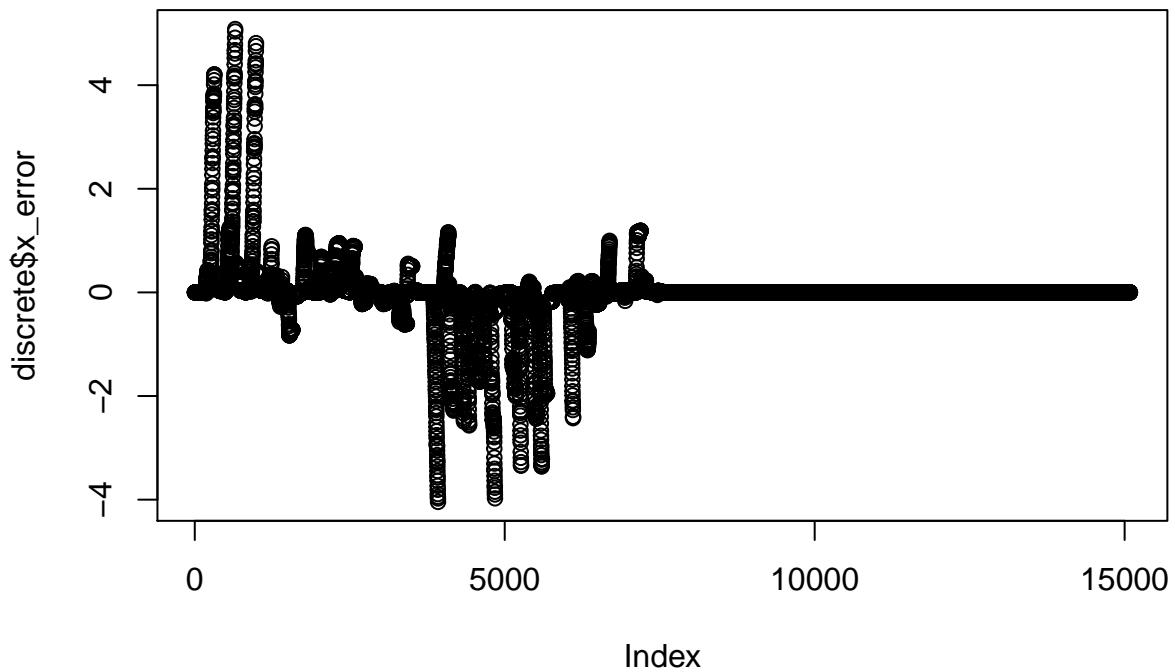
Distance from origin vs. time



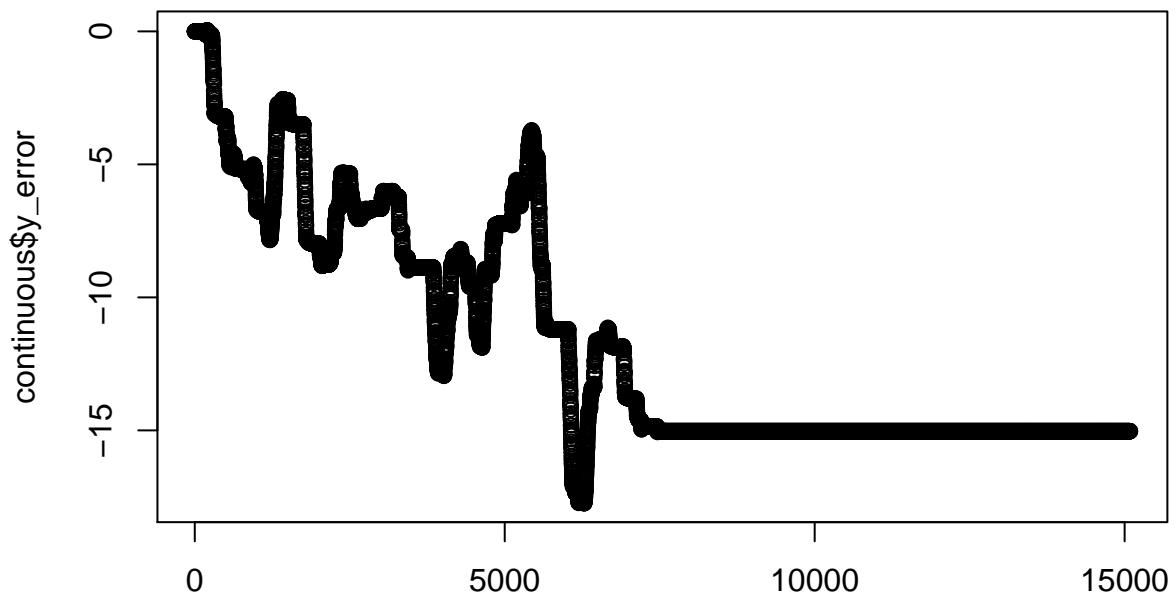
Continuous x_error over time



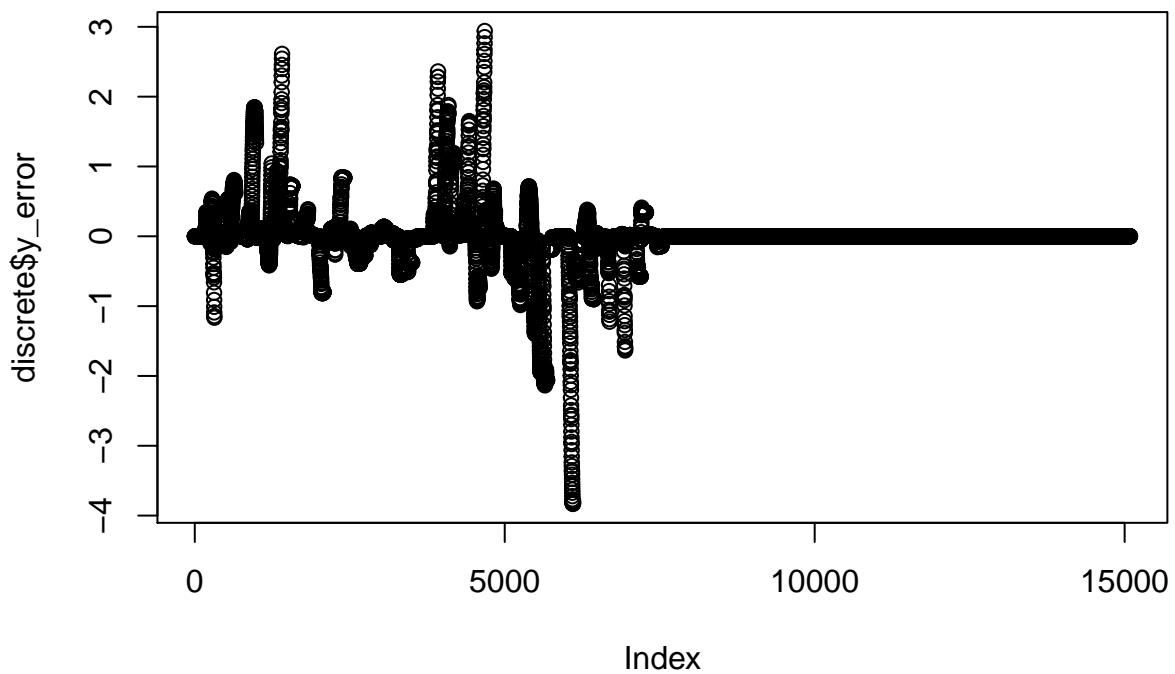
Discrete x_error over time



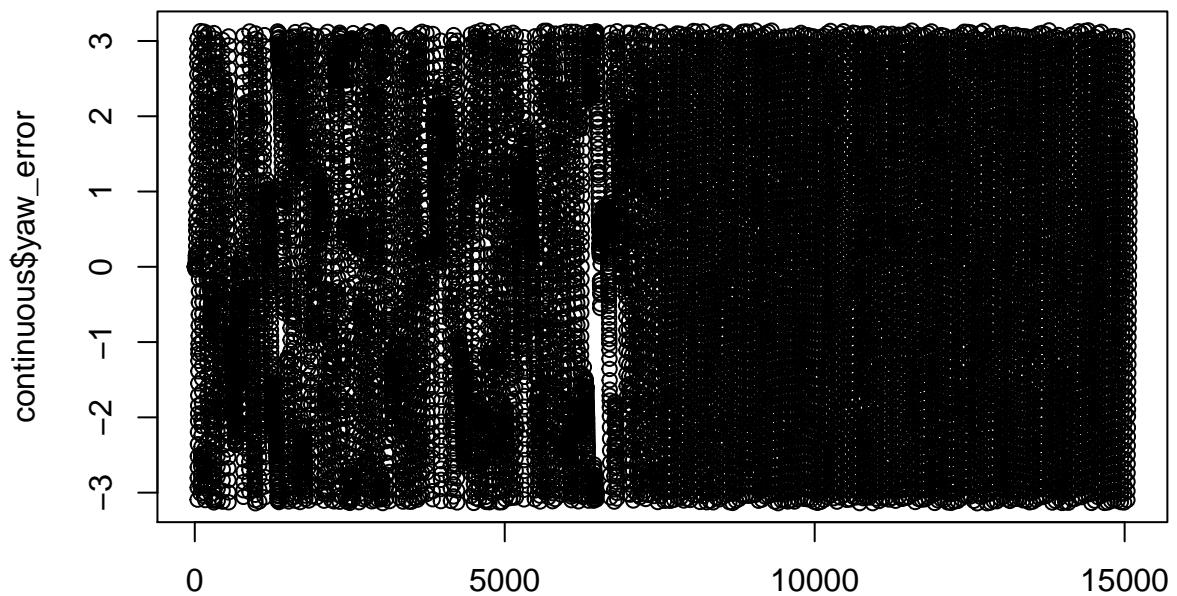
Continuous y_error over time



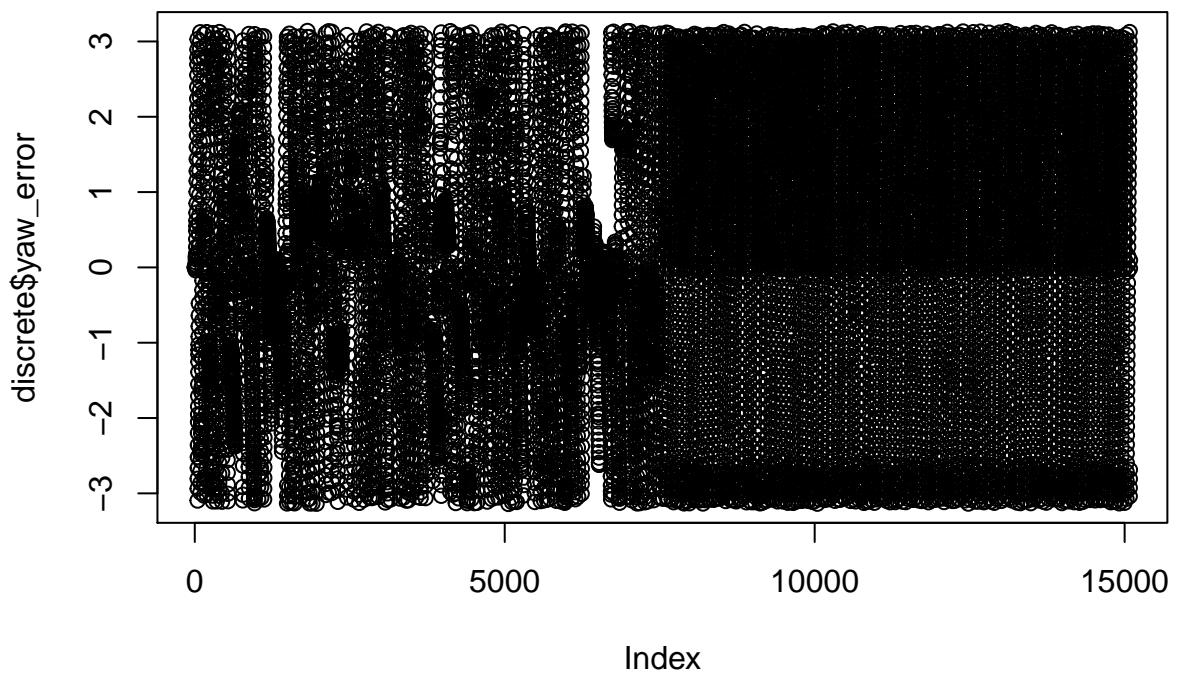
Discrete y_error over time



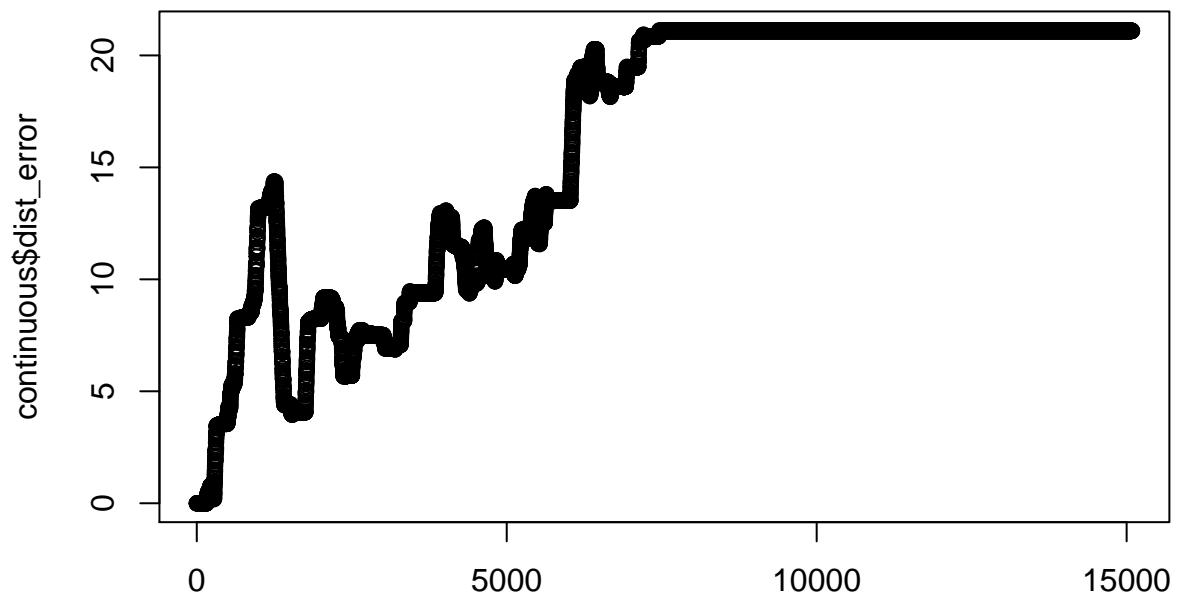
Continuous yaw error over time



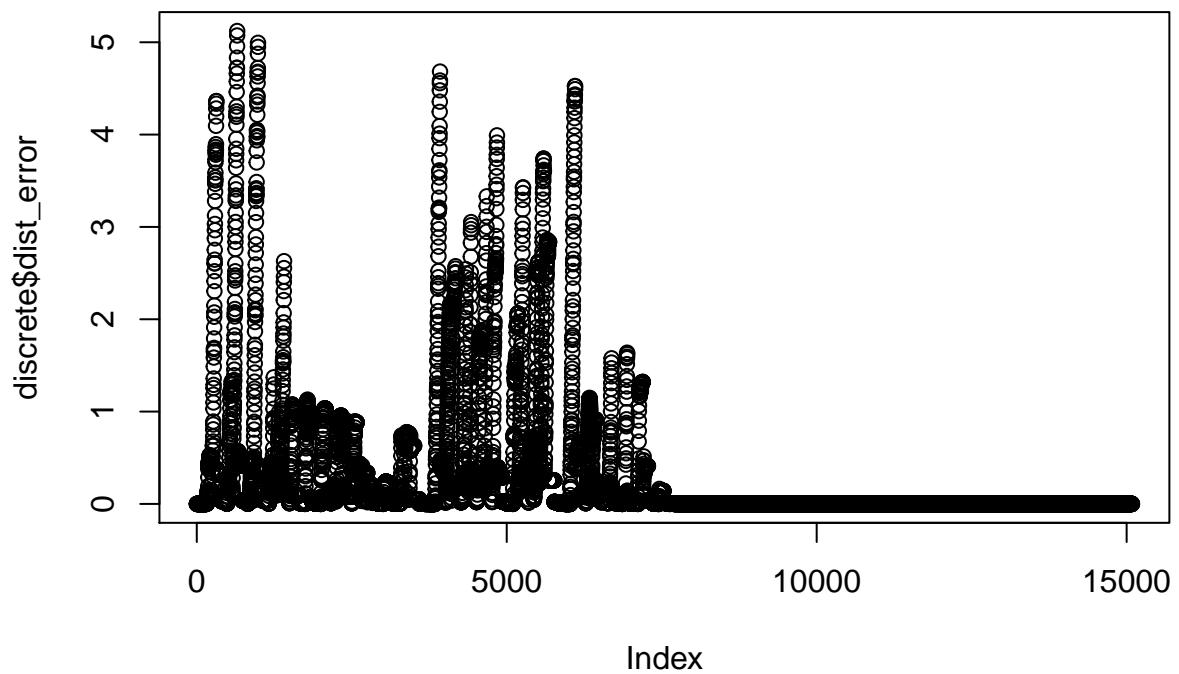
Discrete yaw error over time



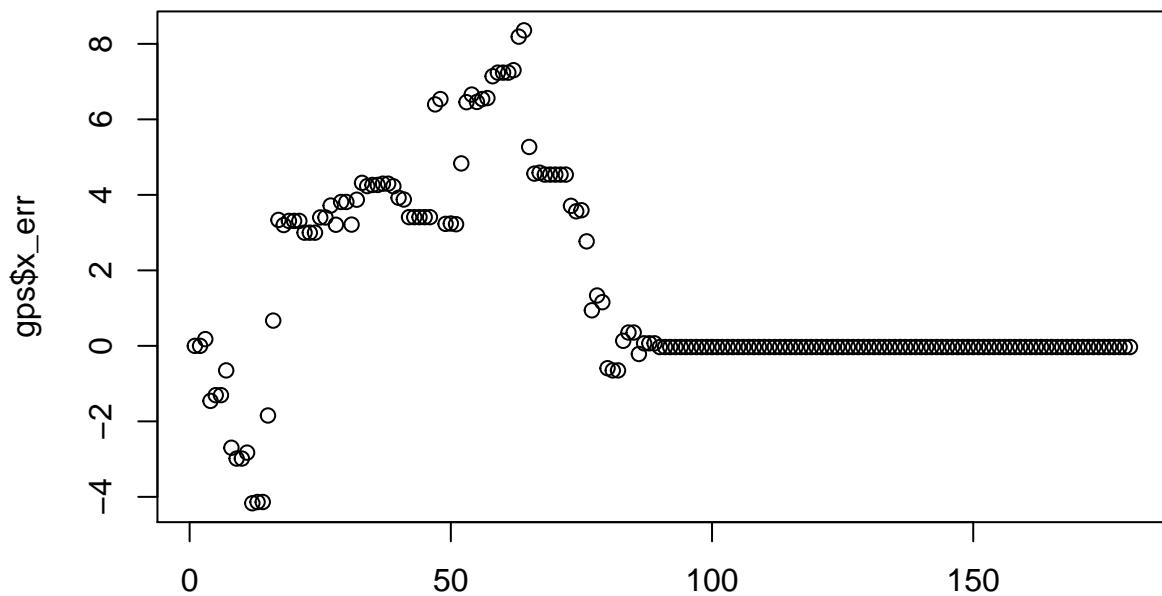
Continuous total distance error over time



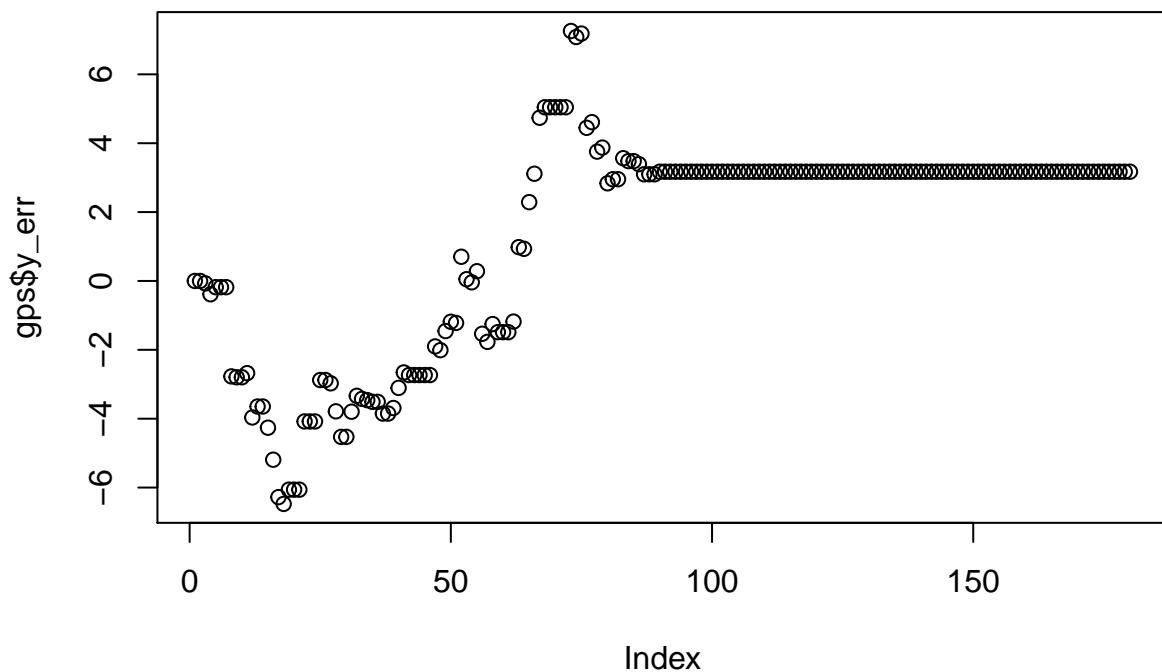
Discrete total distance error over time



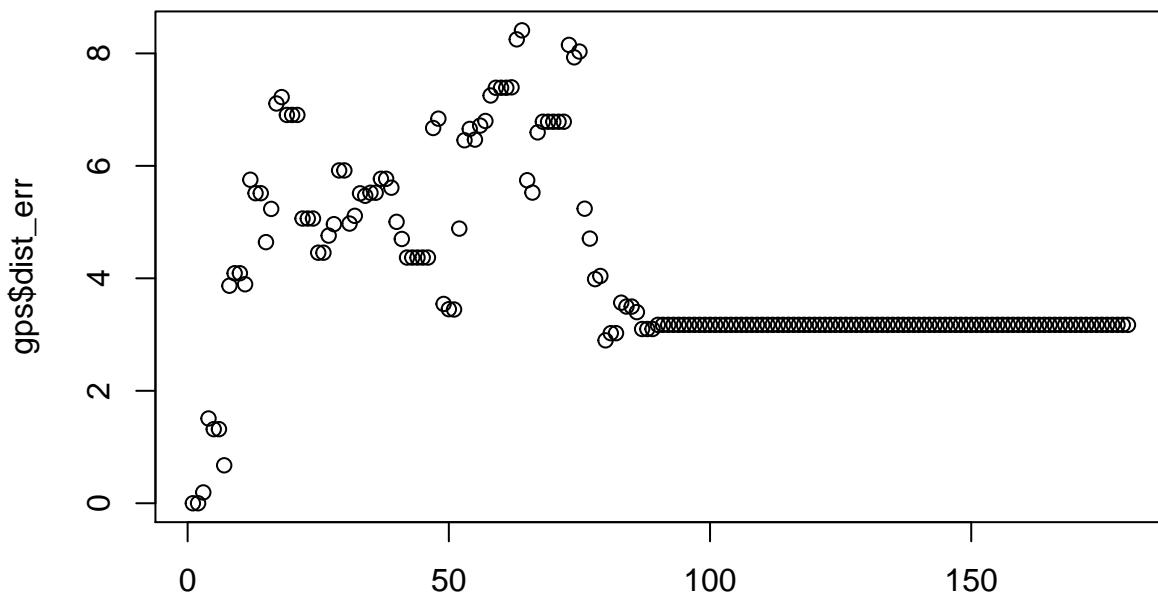
GPS X Error Over Time



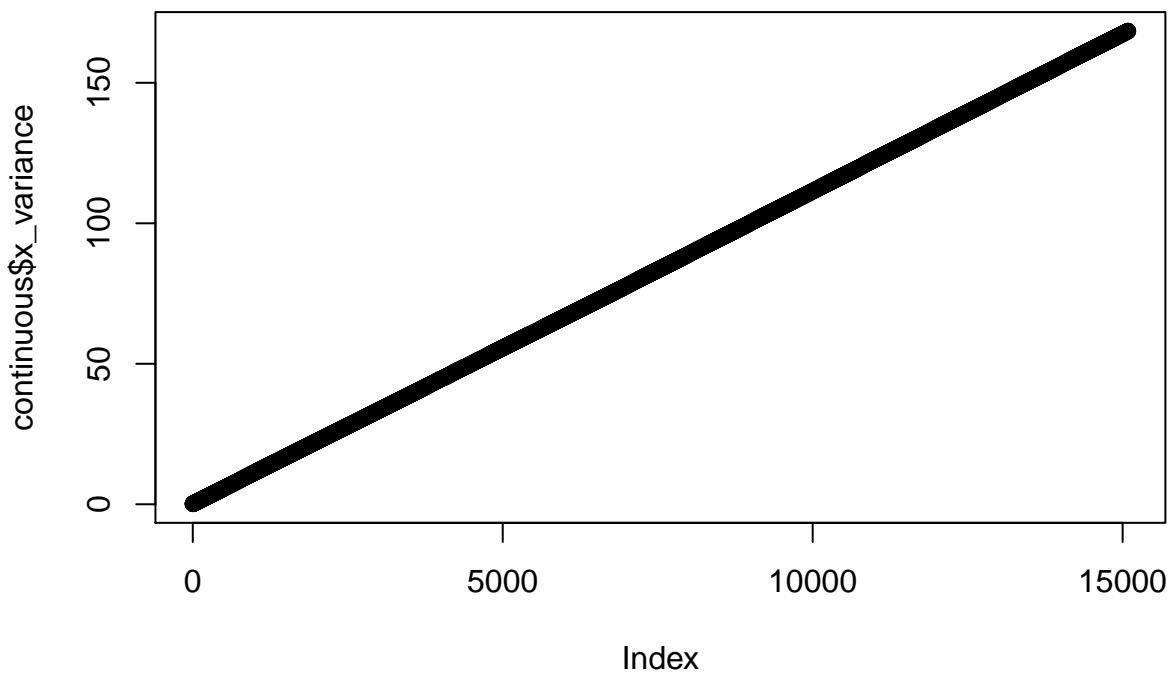
GPS Y Error Over Time



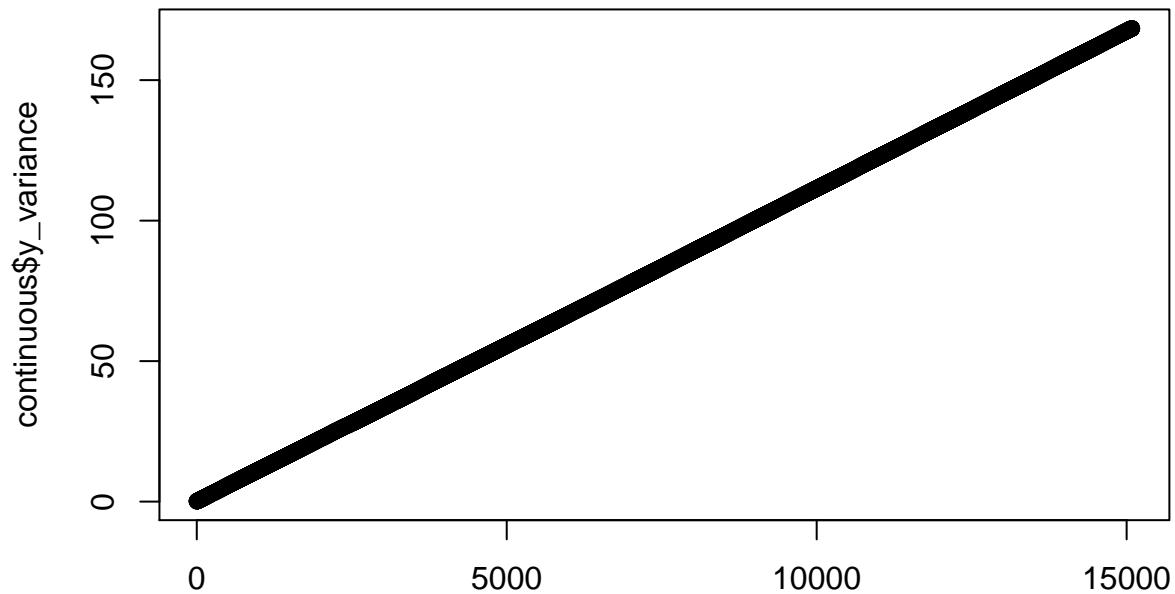
GPS Horizontal Distance Error Over Time



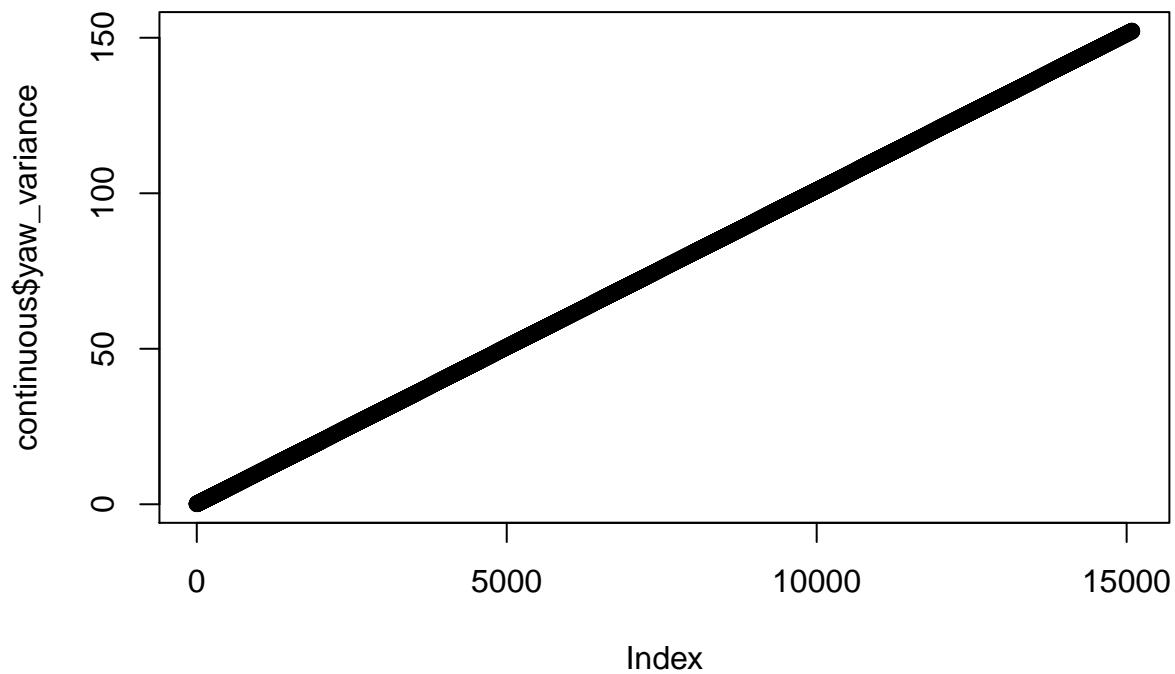
Continuous Filter ^{Index}X Variance Over Time



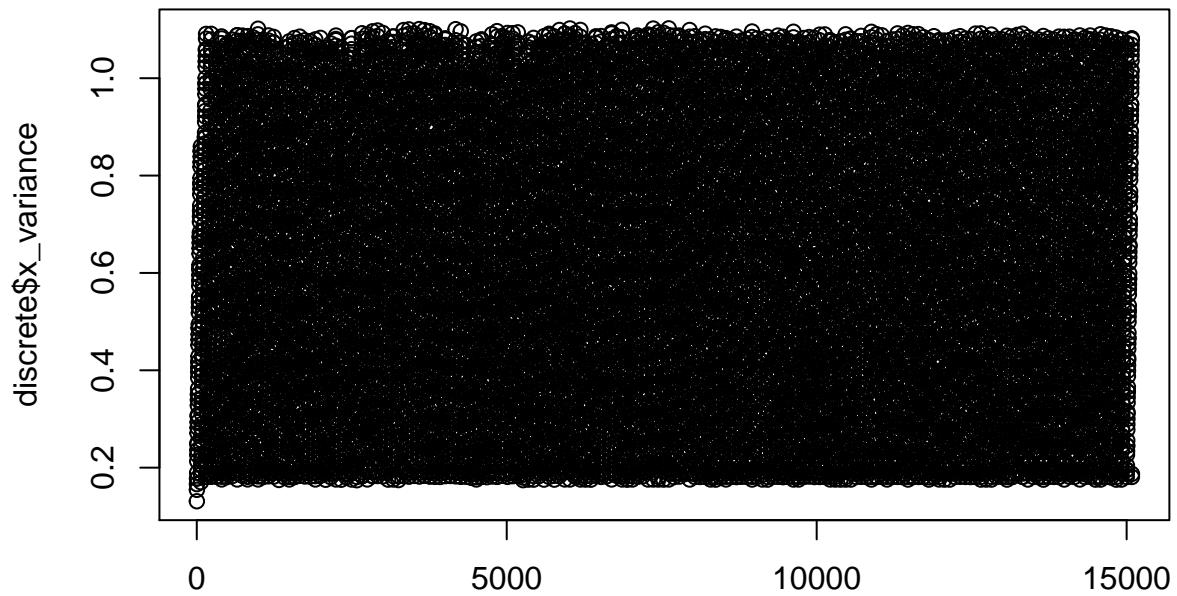
Continuous Filter Y Variance Over Time



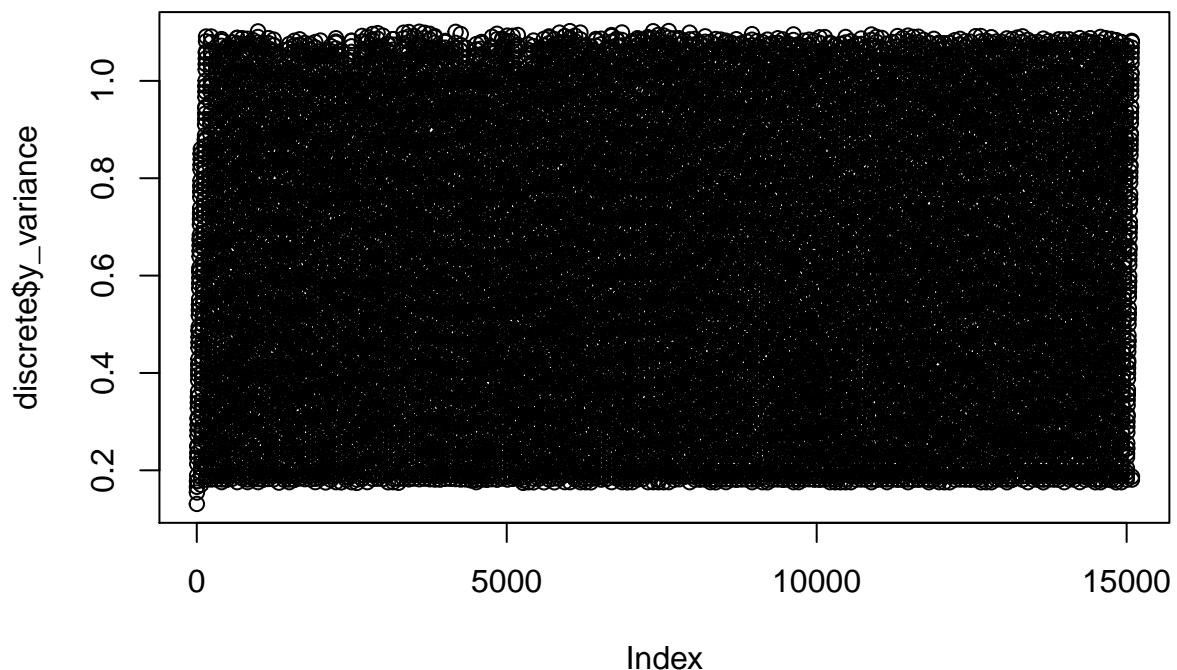
Continuous Filter Yaw Variance Over Time



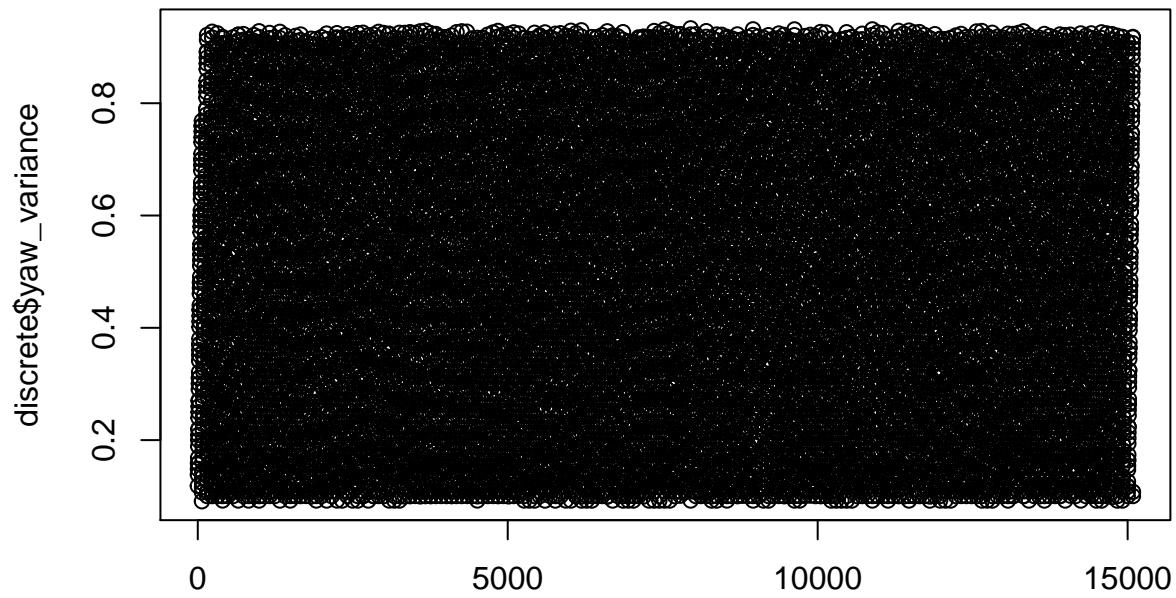
Discrete Filter X Variance Over Time



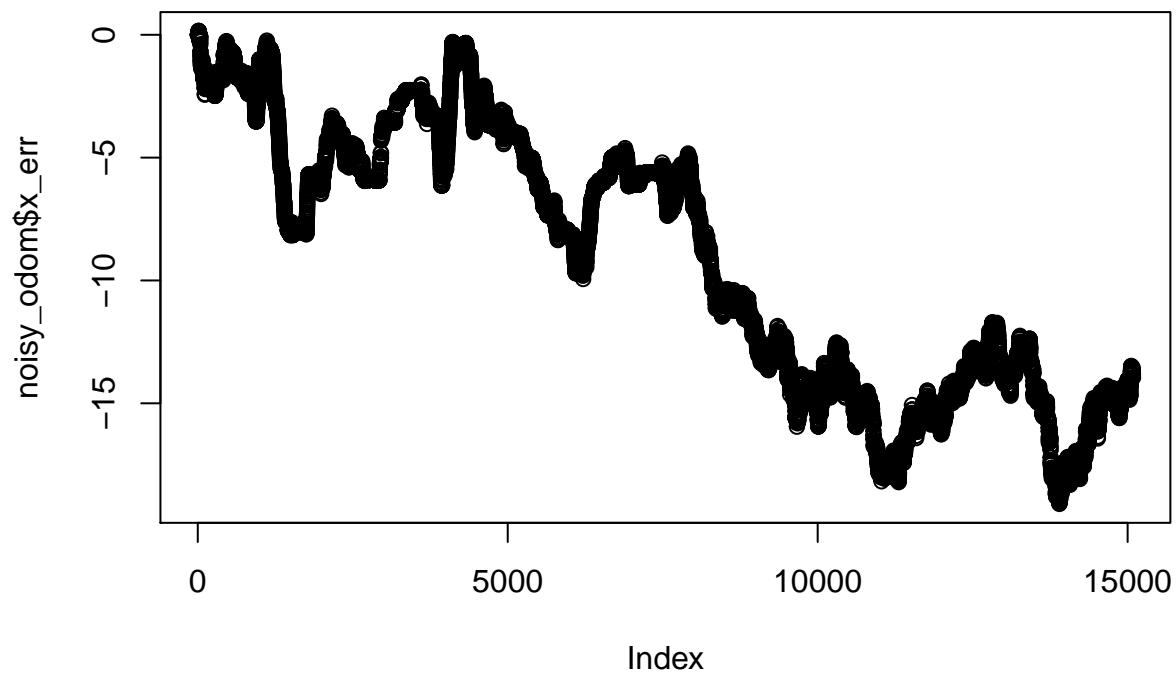
Discrete Filter Y Variance Over Time



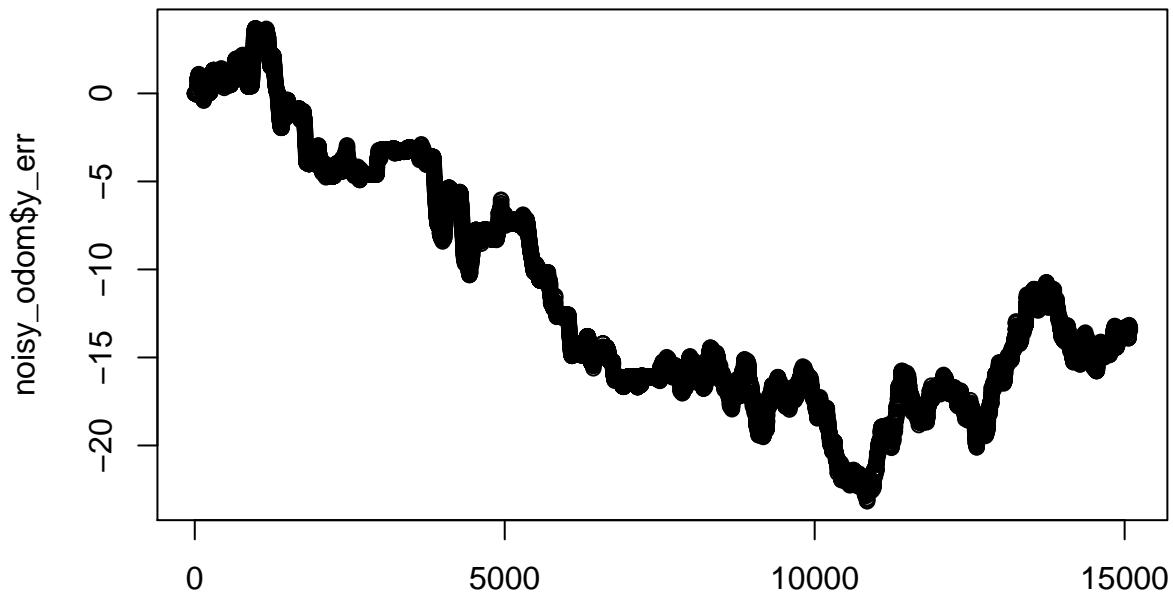
Discrete Filter Yaw Variance Over Time



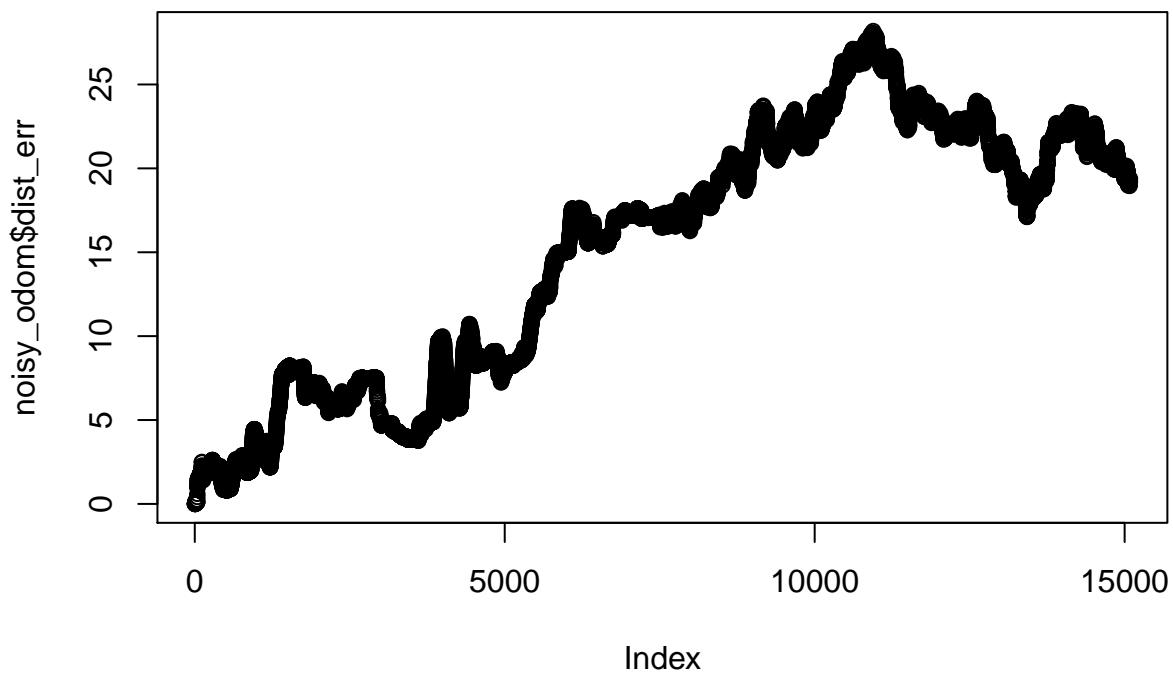
Noisy Odom X Error Over Time



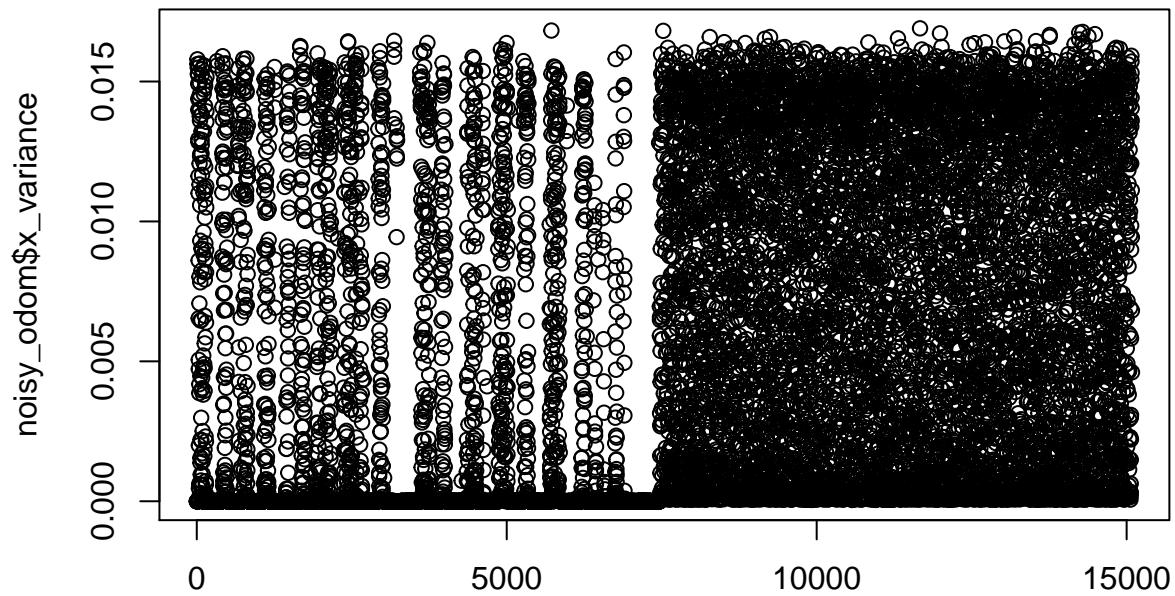
Noisy Odom Y Error Over Time



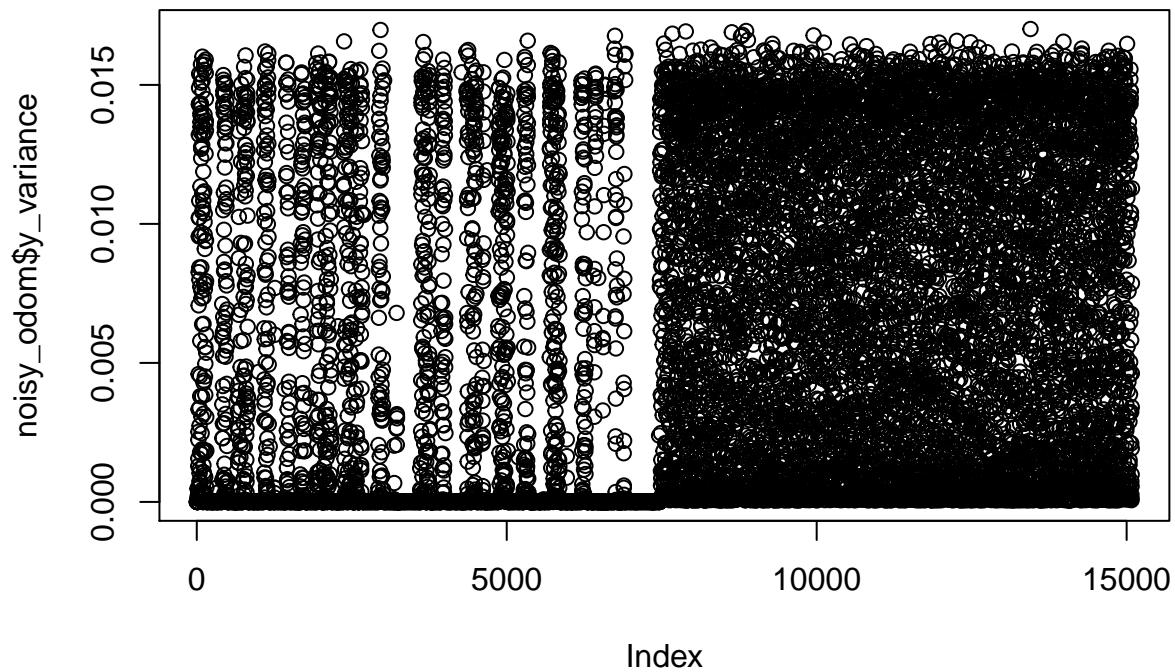
Noisy Odom Horizontal Distance Error Over Time



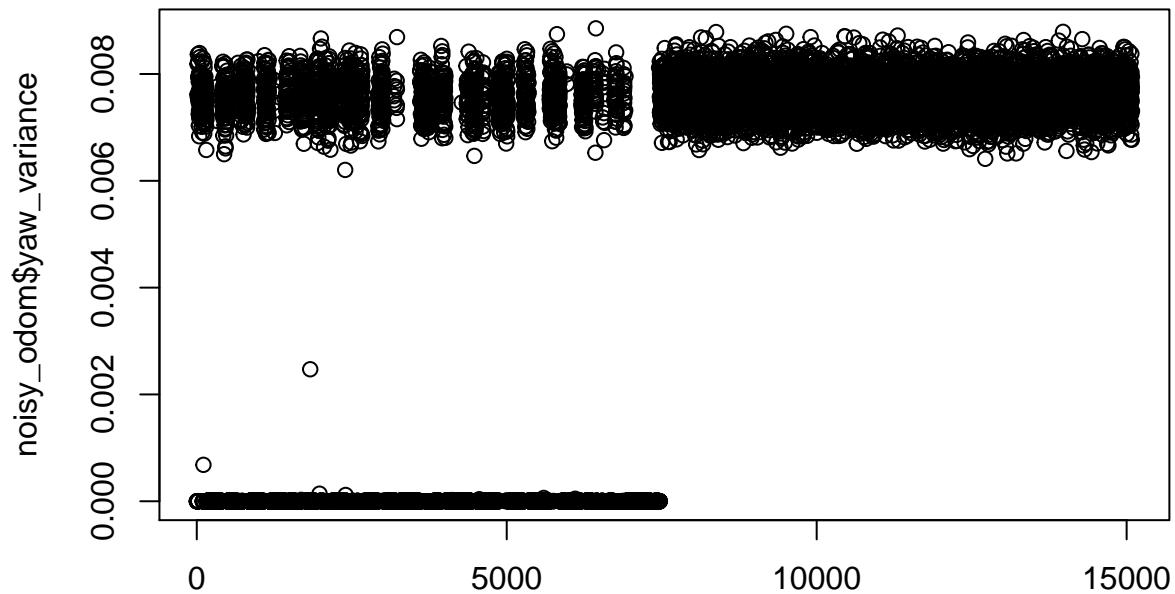
Variance of X Coordinate in Noisy Odometry



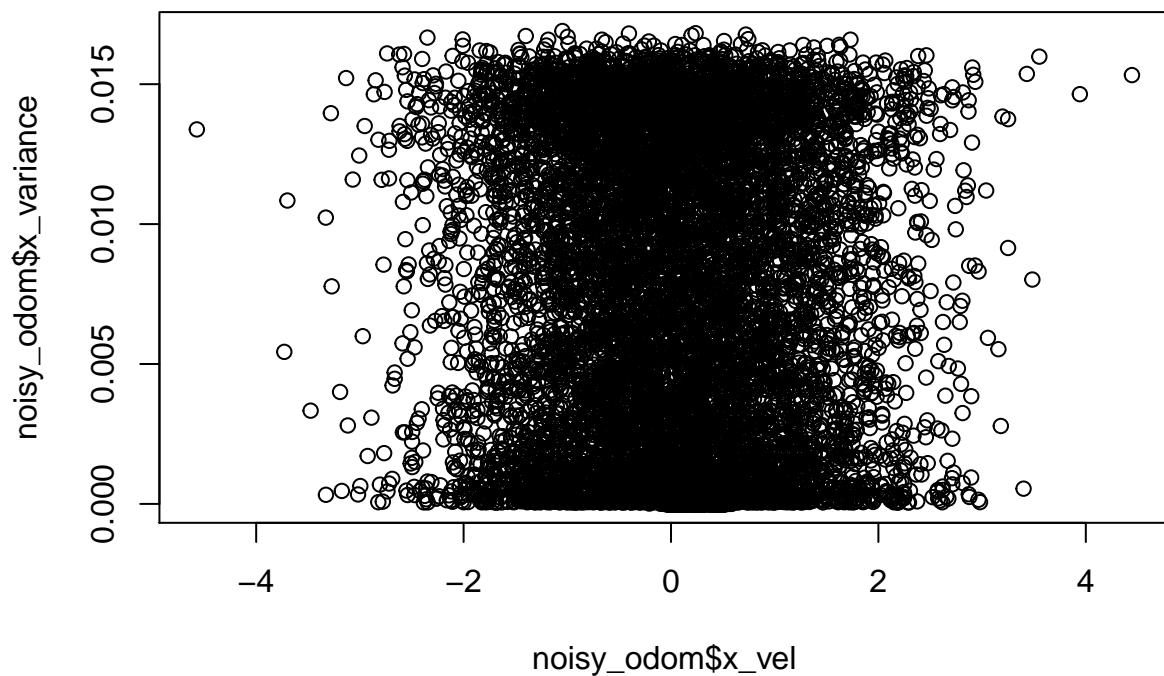
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

