

two_mobile_noiseless_no_gps Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 6 minutes, and 45.6 seconds.

The total number of external pose measurements received by the robot during this time was 636 which means poses were received at an average of 1.5680473 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.
## -1.092000 -1.092000 -1.092000 -1.063000 -1.091000  0.005455

summary(continuous$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -0.7268 -0.7266 -0.7264 -0.7140 -0.7262  0.0000

summary(continuous$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -3.138   2.328   2.427   2.096   2.557   3.102

summary(continuous$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## 0.0000144 1.3110000 1.3110000 1.2810000 1.3110000 1.3120000

summary(discrete$x_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -28.97000 -23.10000 -18.82000 -18.72000 -13.71000  0.00232

summary(discrete$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -9.5900 -0.5336 34.7800 32.1700 59.9300 95.6700

summary(discrete$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -3.140   2.404   2.488   2.131   2.551   3.100

summary(discrete$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## 0.00001 28.99000 39.86000 43.18000 61.63000 95.97000

summary(noisy_odom$x_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -6.1090 -3.8690 -2.9360 -2.2880 -0.2407  0.3618
```

```

summary(noisy_odom$y_err)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## -2.327000 -1.569000 -0.345400 -0.692700  0.009608  1.072000

summary(noisy_odom$dist_err)

##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 0.000006 0.604800 2.940000 2.487000 4.217000 6.383000

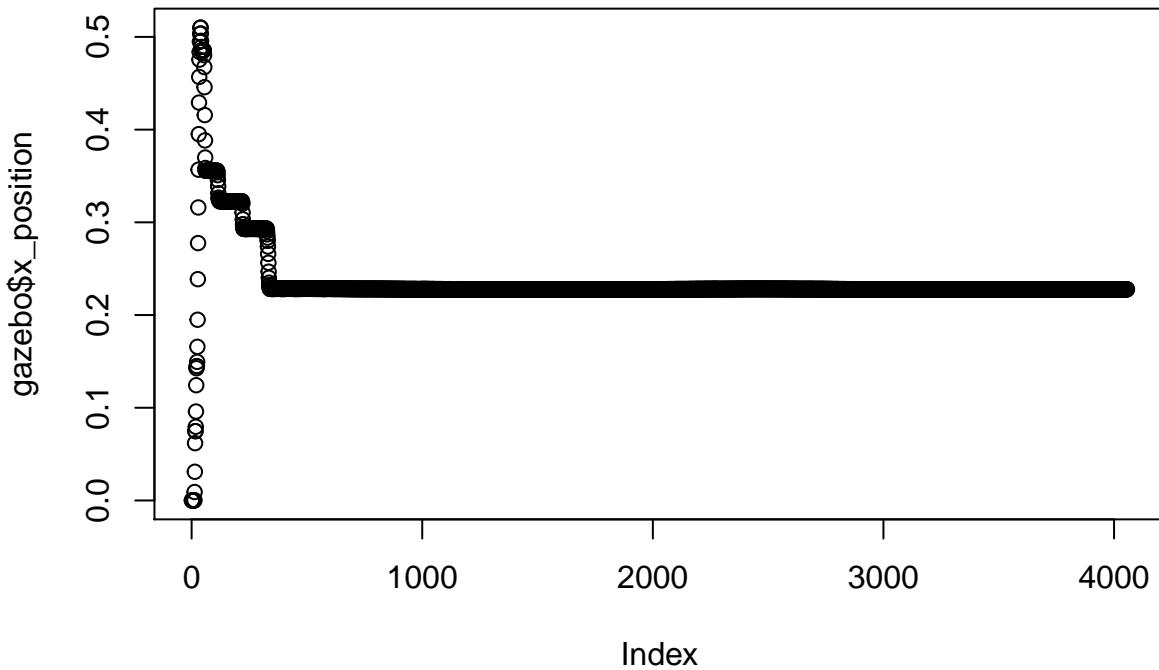
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

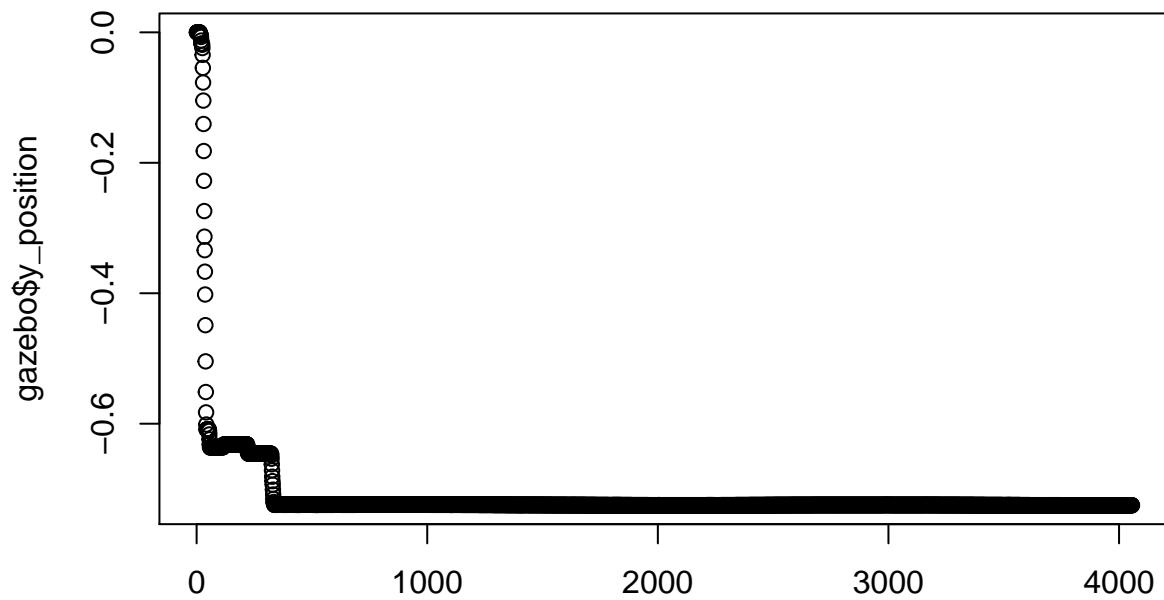
##      Min.    1st Qu.     Median      Mean    3rd Qu.      Max.
## 0.000e+00 0.000e+00 0.000e+00 1.869e-03 6.013e-06 8.909e-03

```

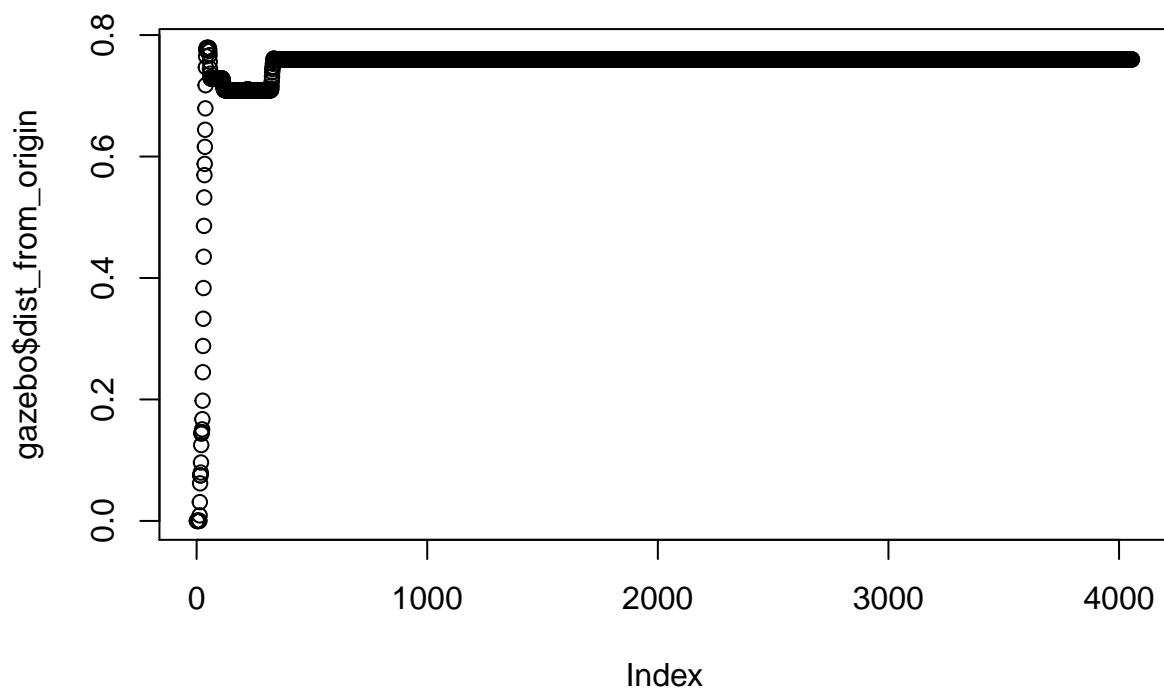
X coordinate of robot over time



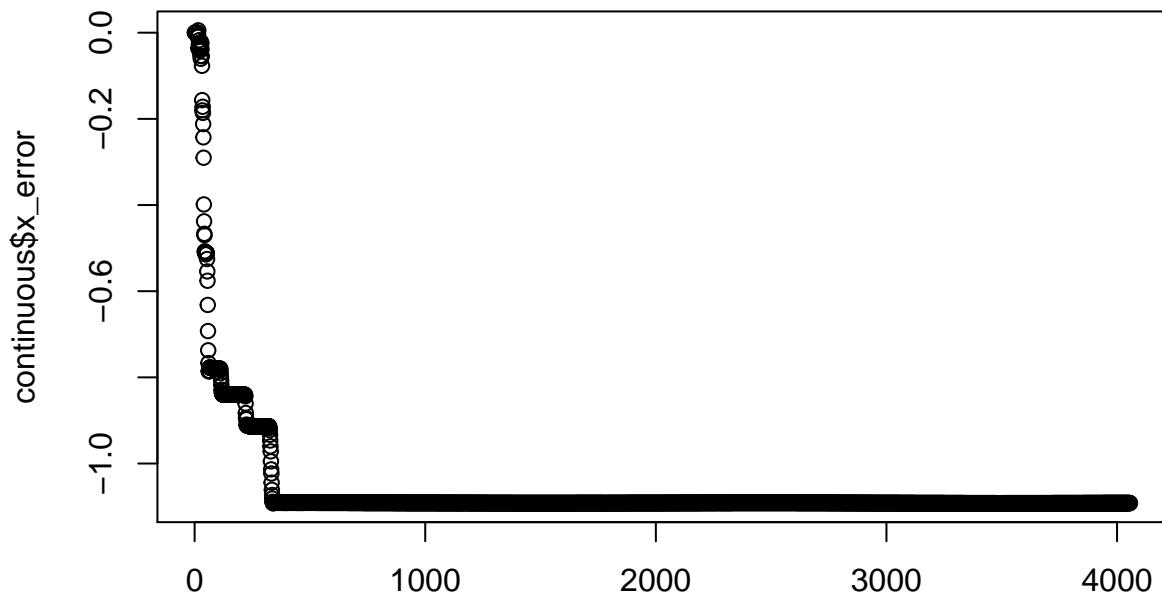
Y coordinate of robot over time



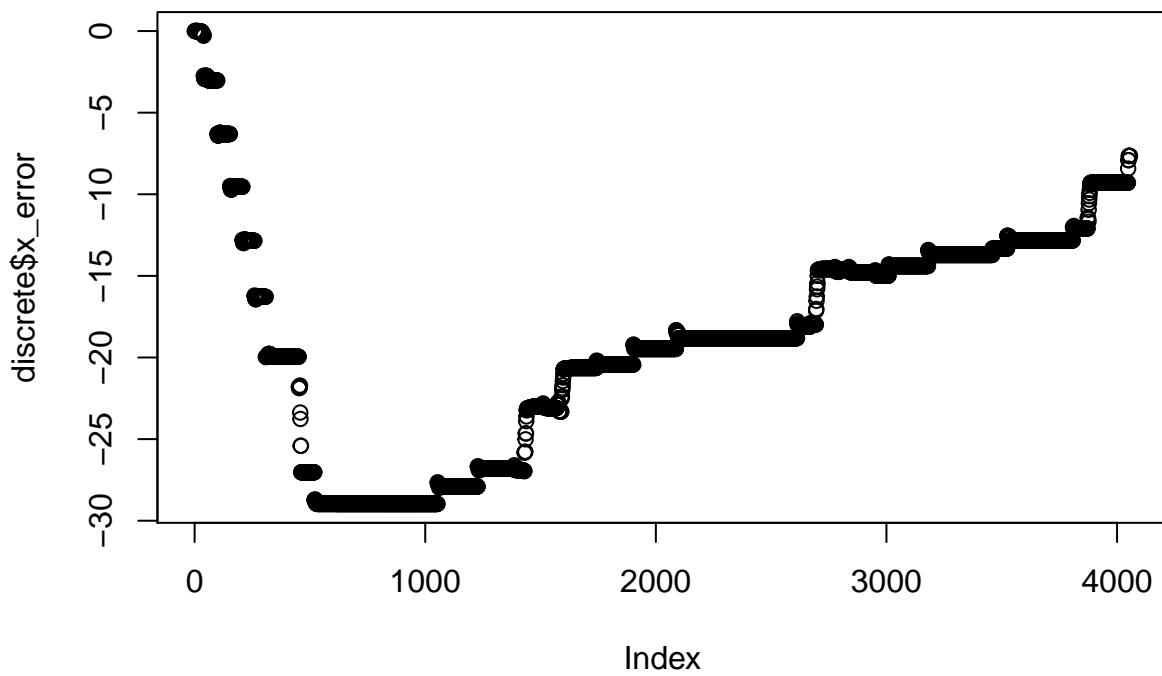
Distance from origin vs. time



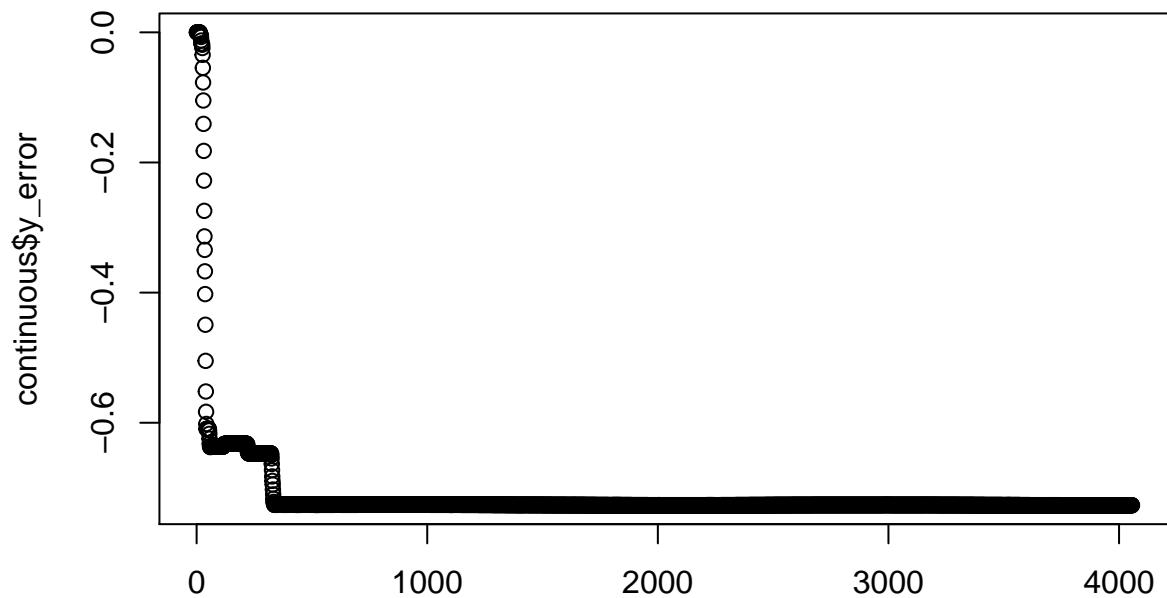
Continuous x_error over time



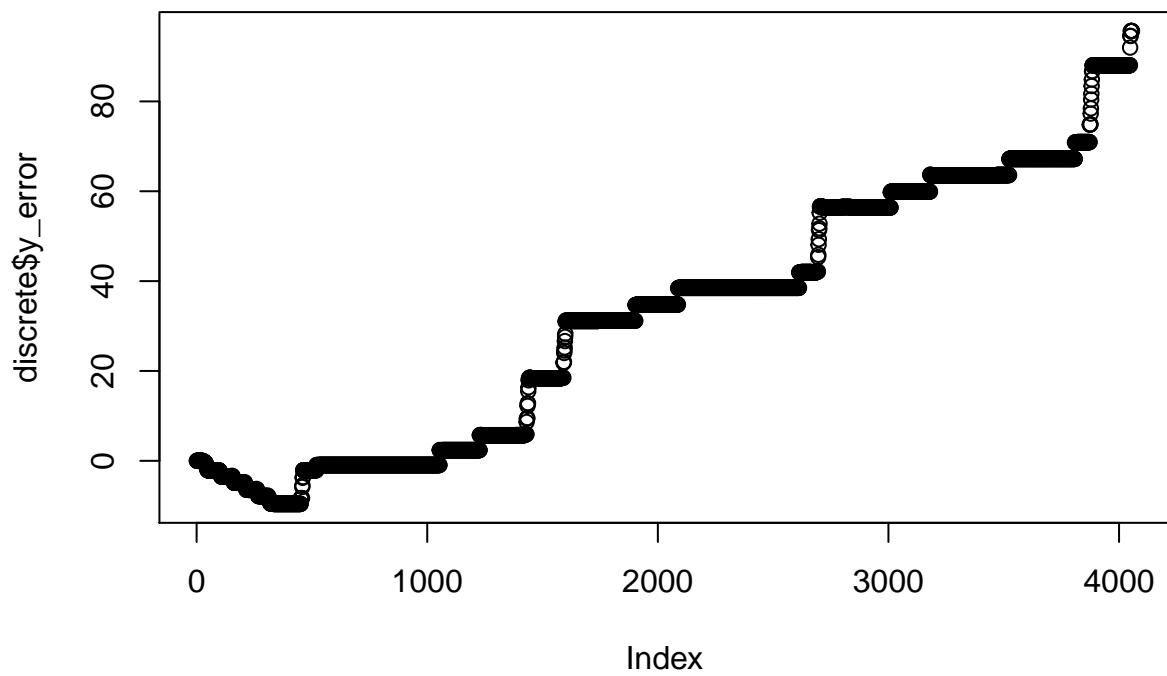
Discrete x_error over time



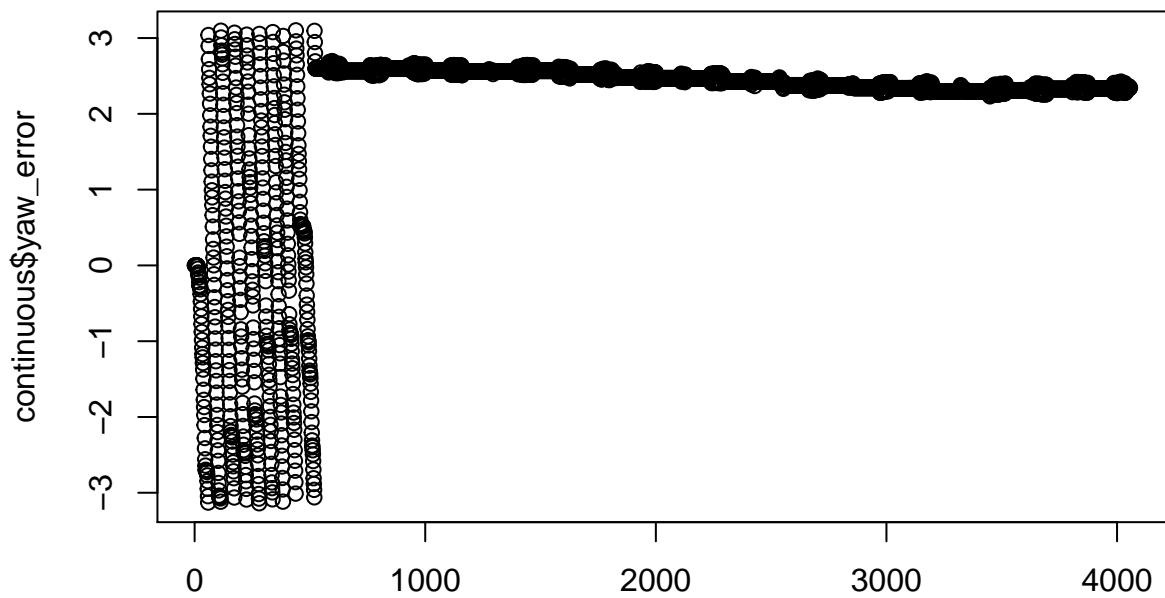
Continuous y_error over time



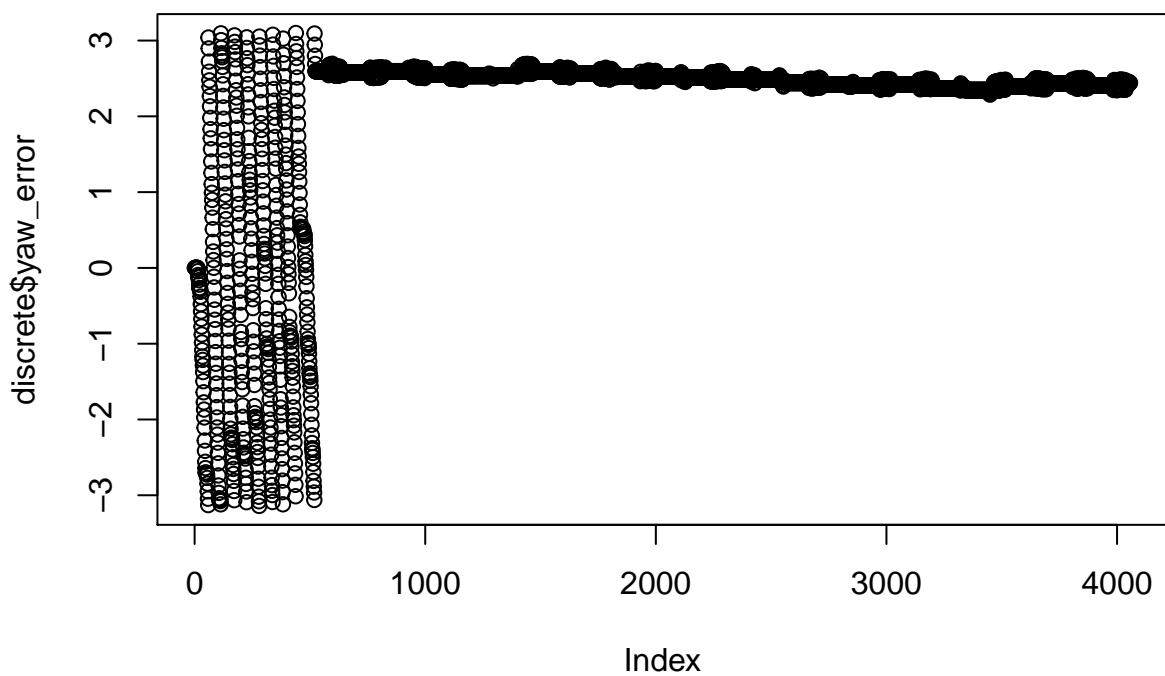
Discrete y_error over time



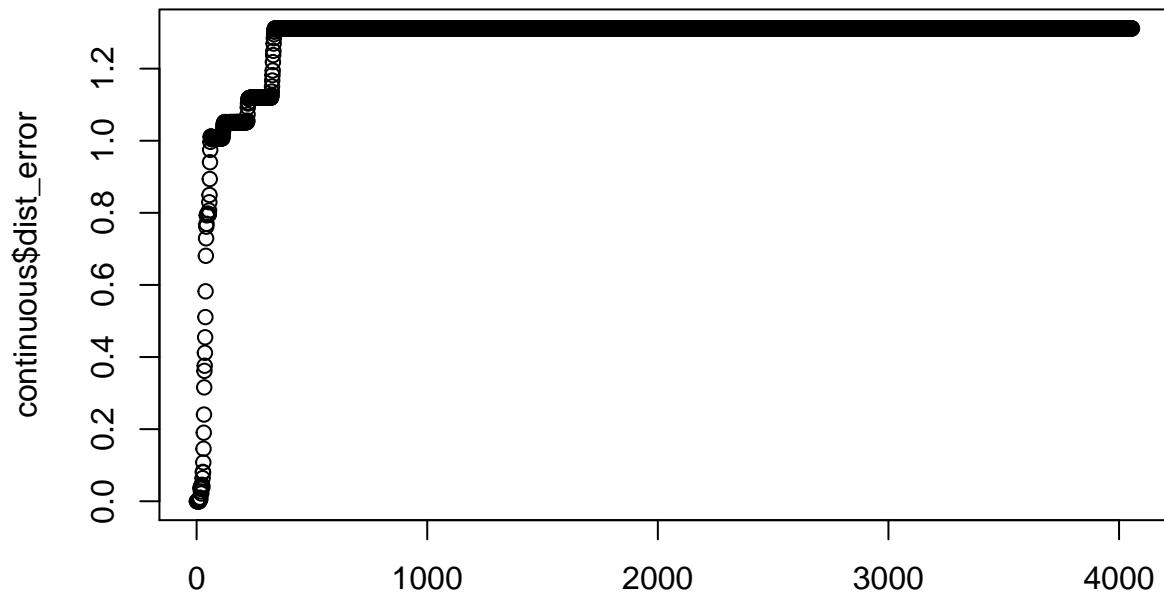
Continuous yaw error over time



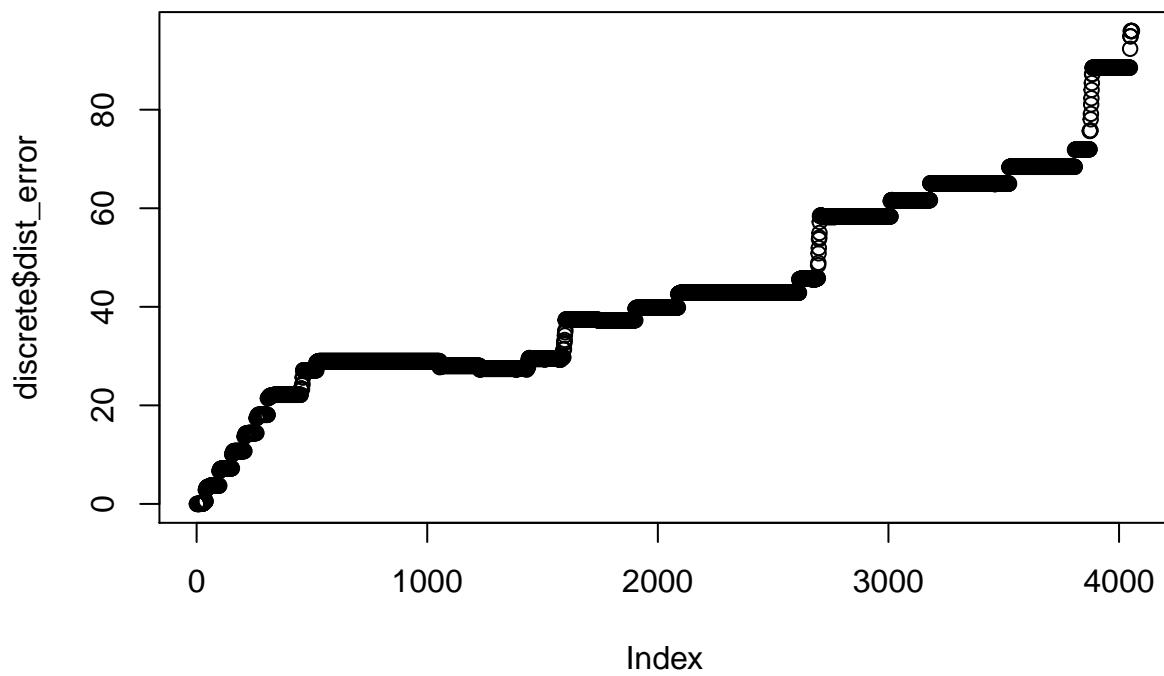
Discrete yaw error over time



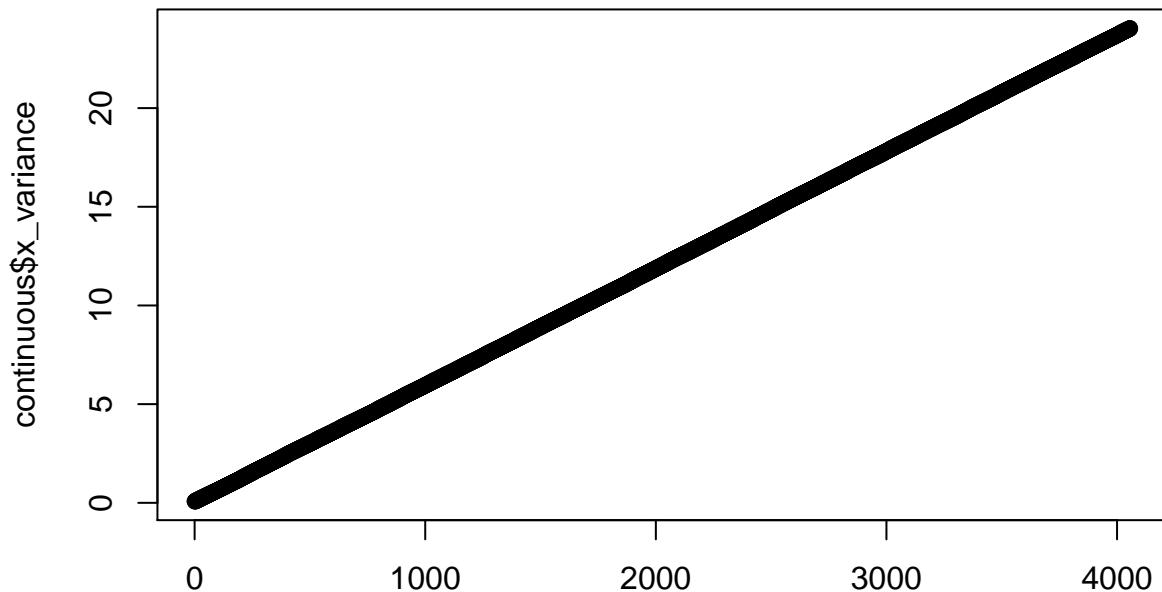
Continuous total distance error over time



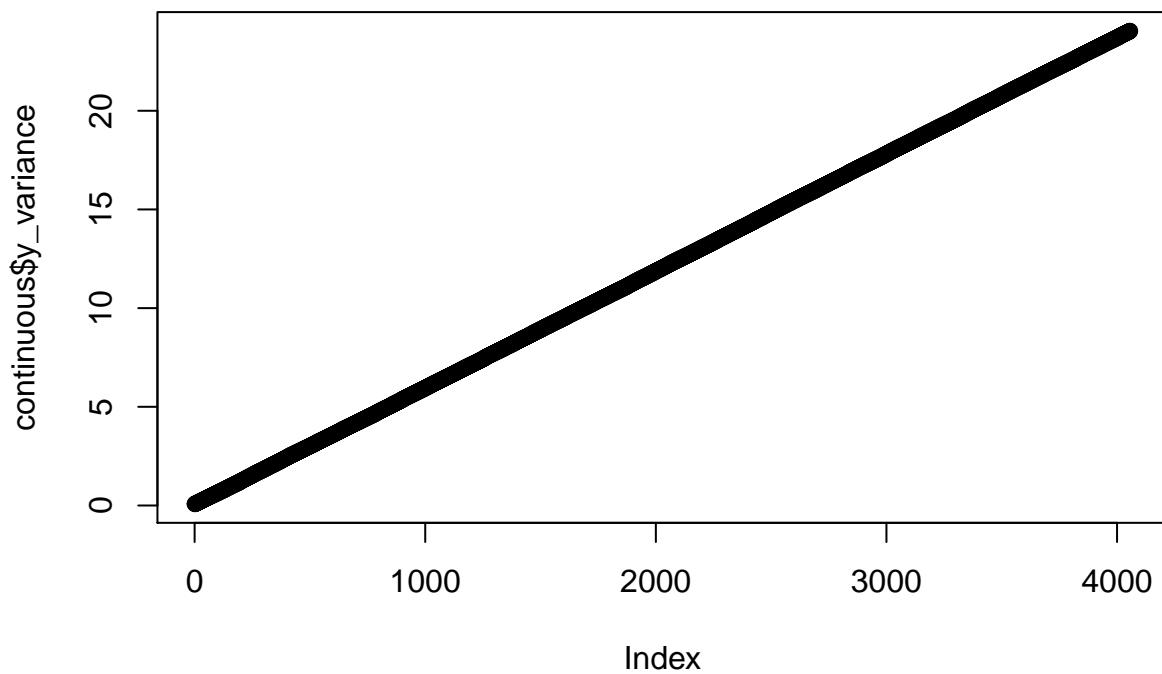
Discrete total distance error over time



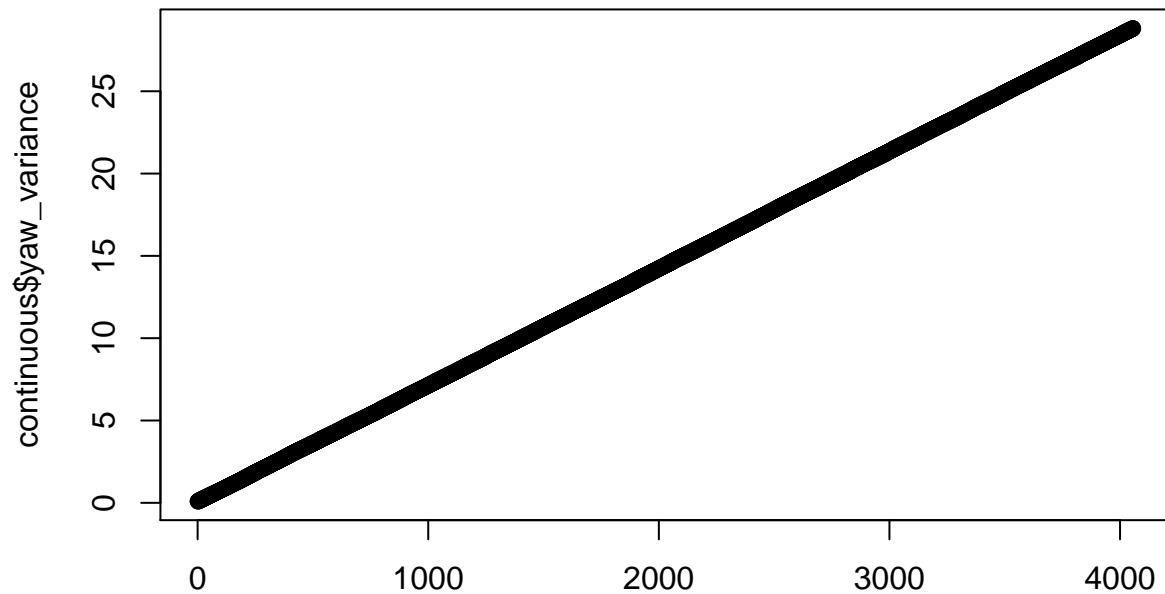
Continuous Filter X Variance Over Time



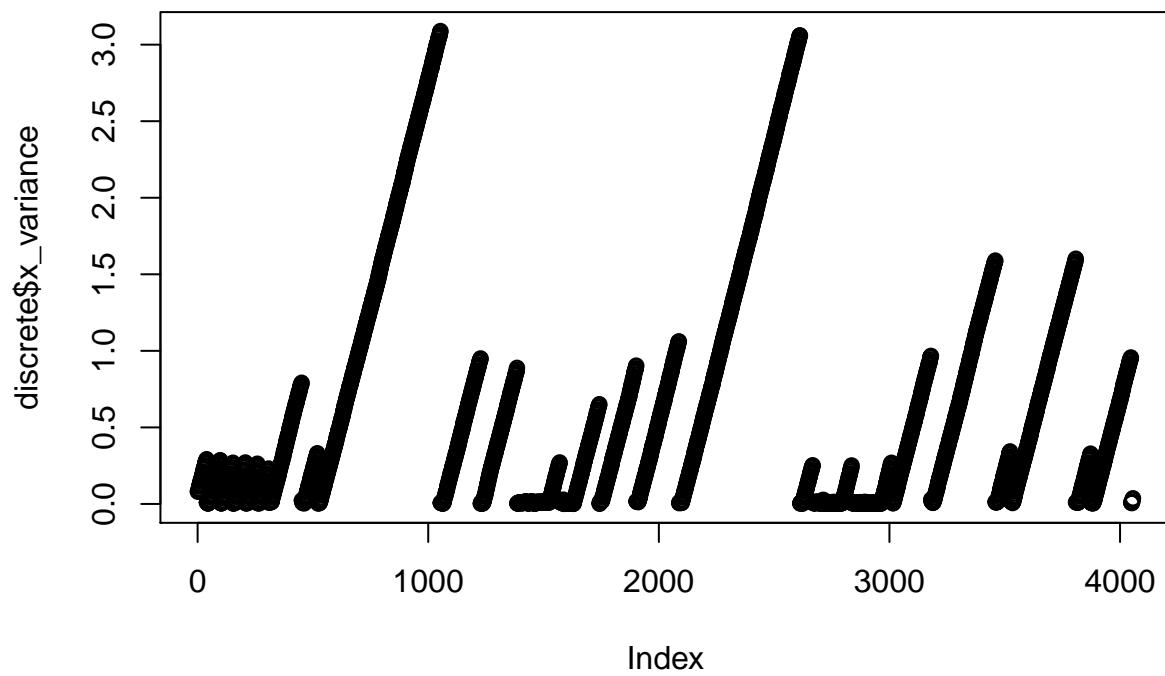
Continuous Filter Y Variance Over Time



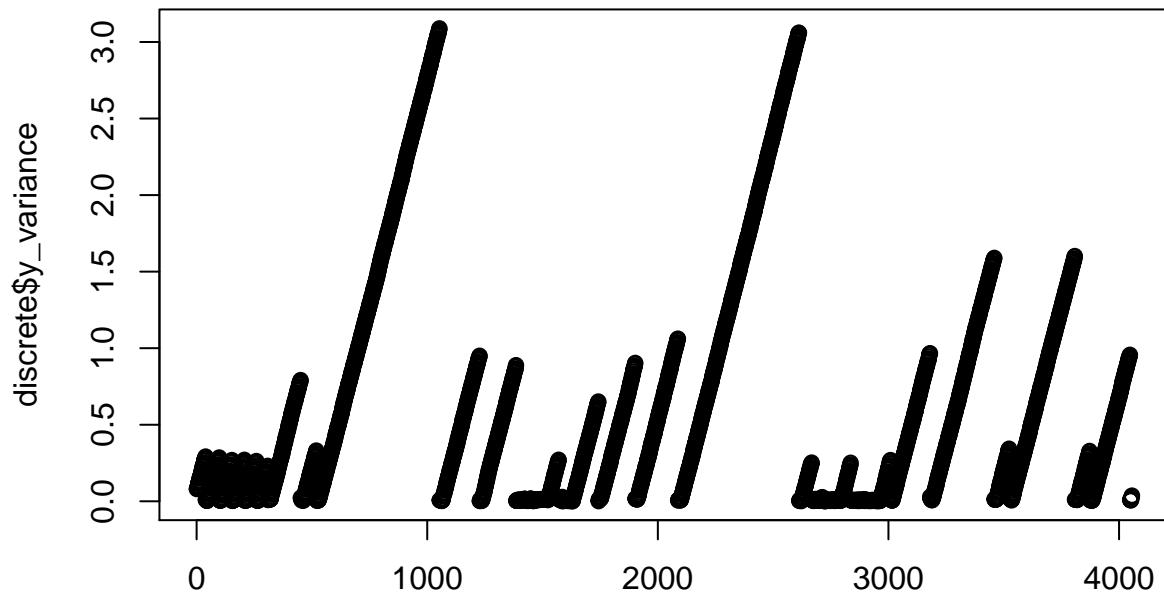
Continuous Filter Yaw Variance Over Time



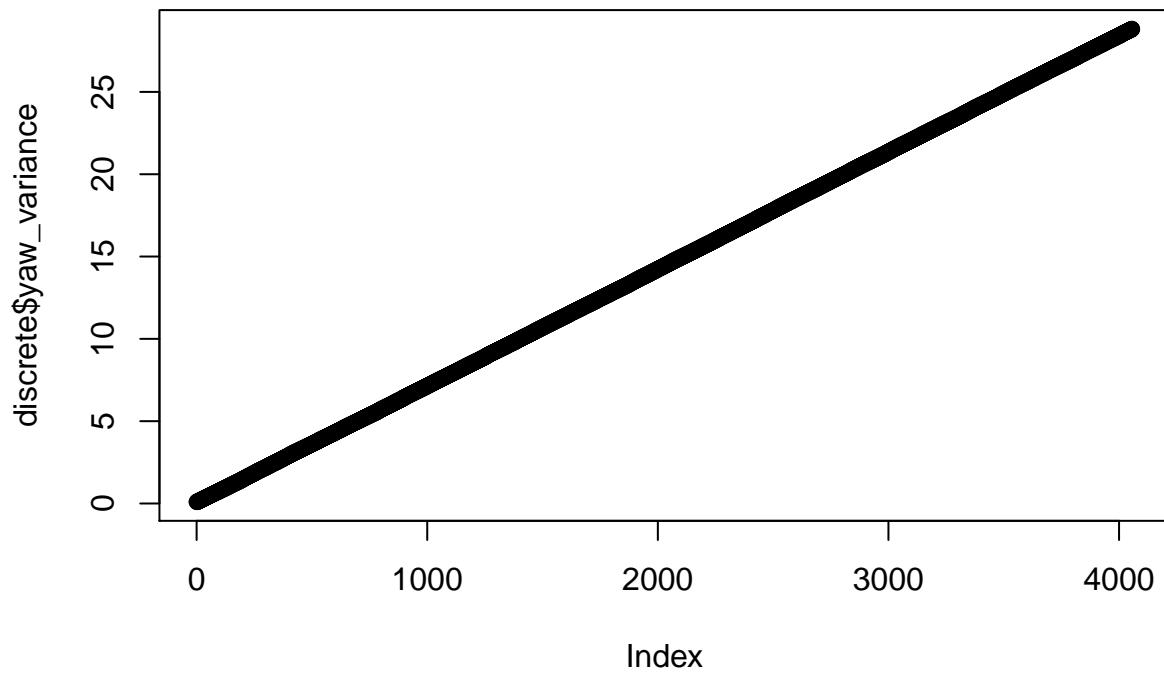
Discrete Filter X Variance Over Time



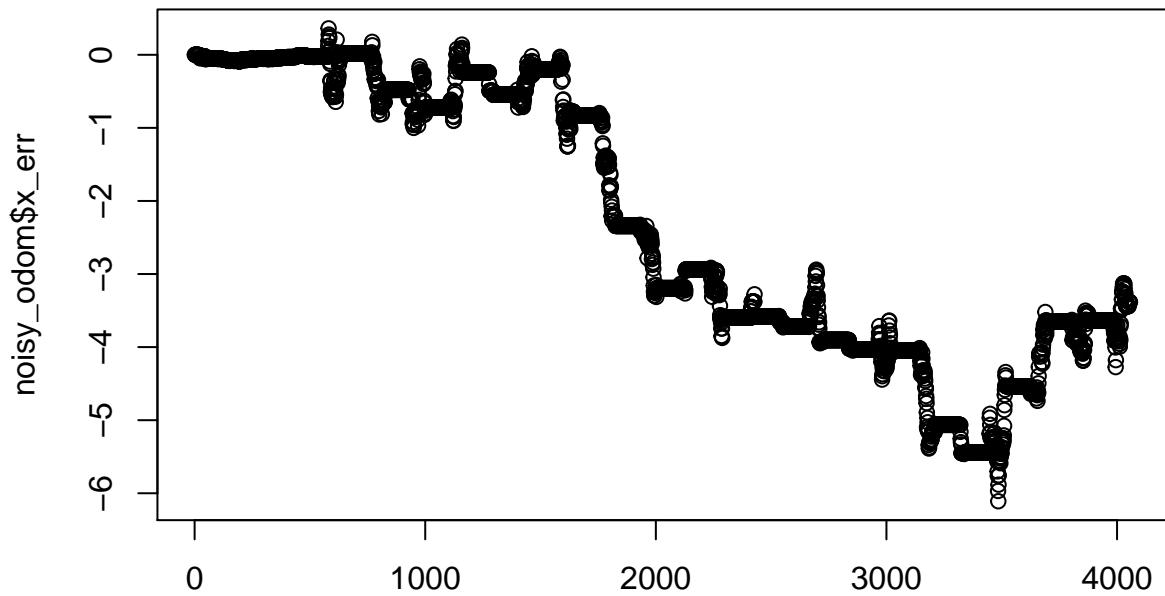
Discrete Filter Y Variance Over Time



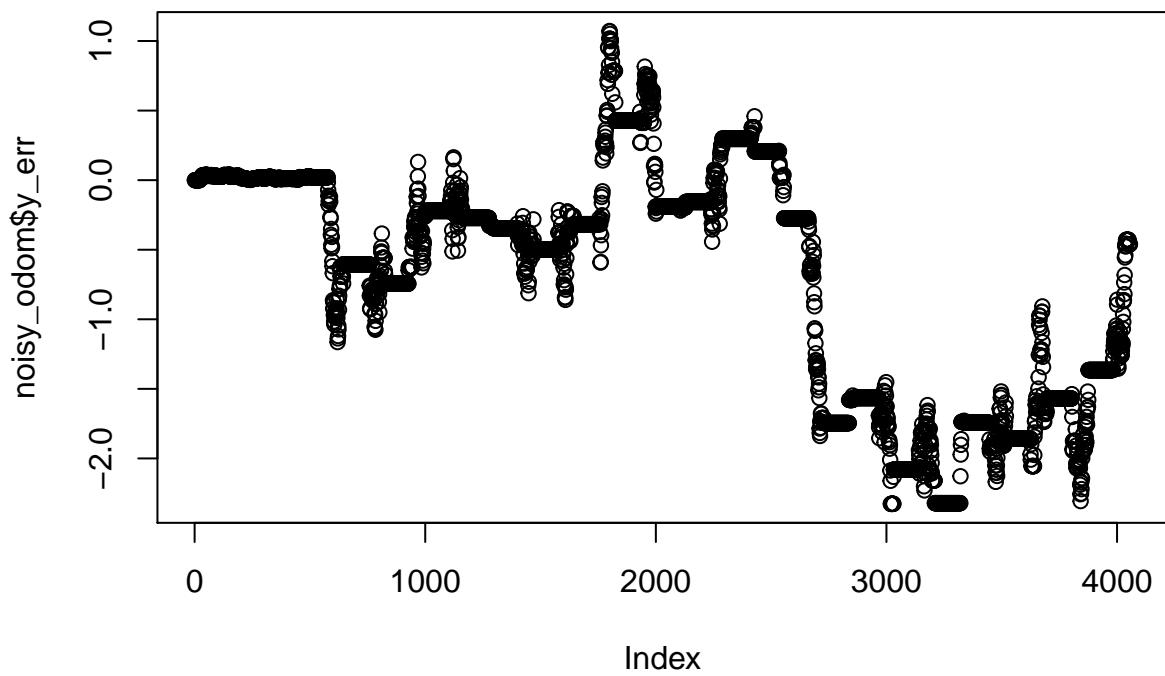
Discrete Filter Yaw Variance Over Time



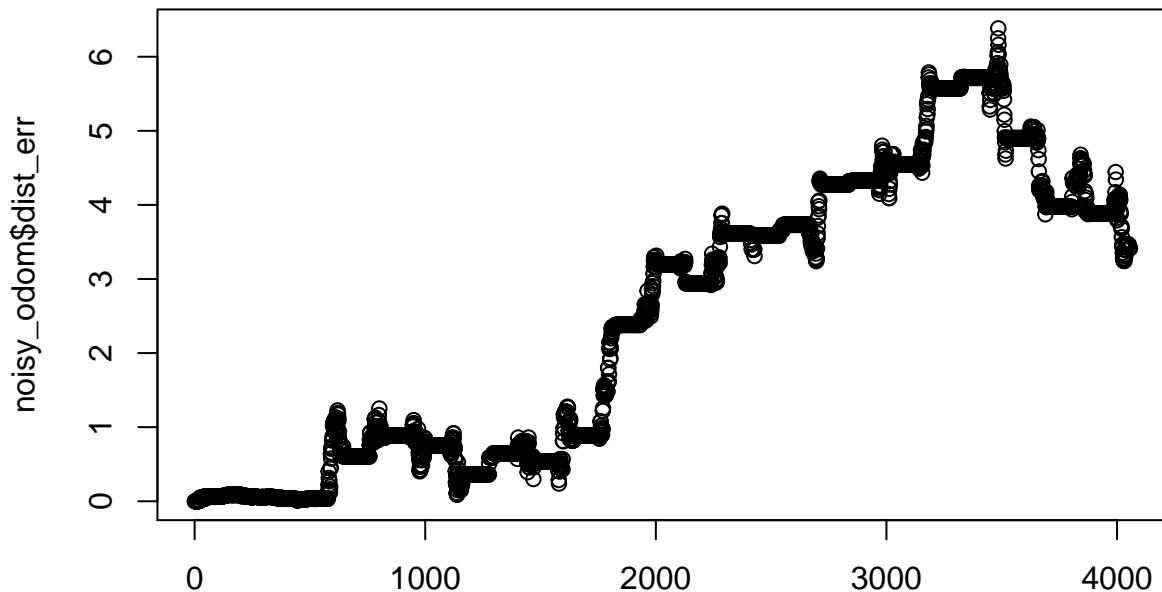
Noisy Odom X Error Over Time



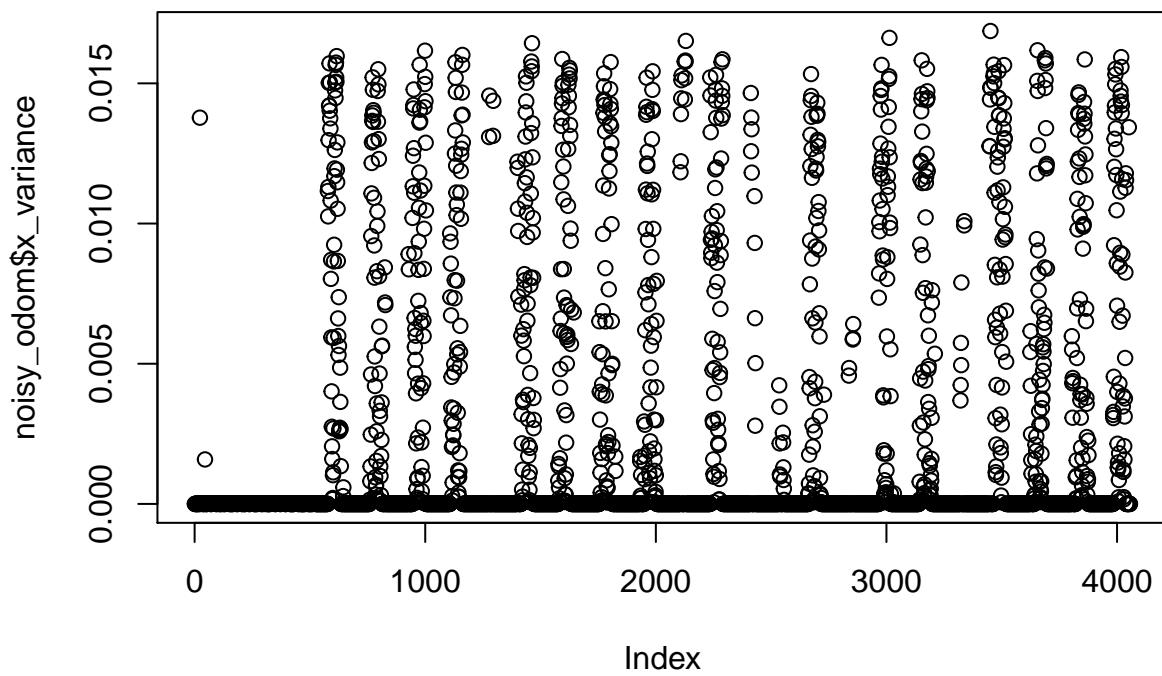
Noisy Odom Y Error Over Time



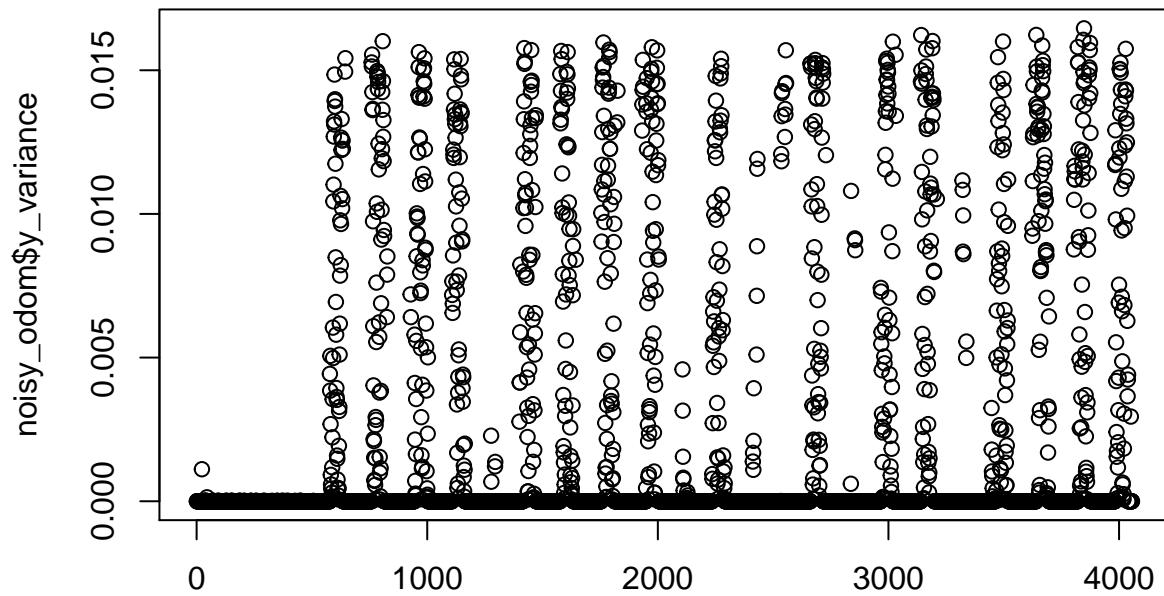
Noisy Odom Horizontal Distance Error Over Time



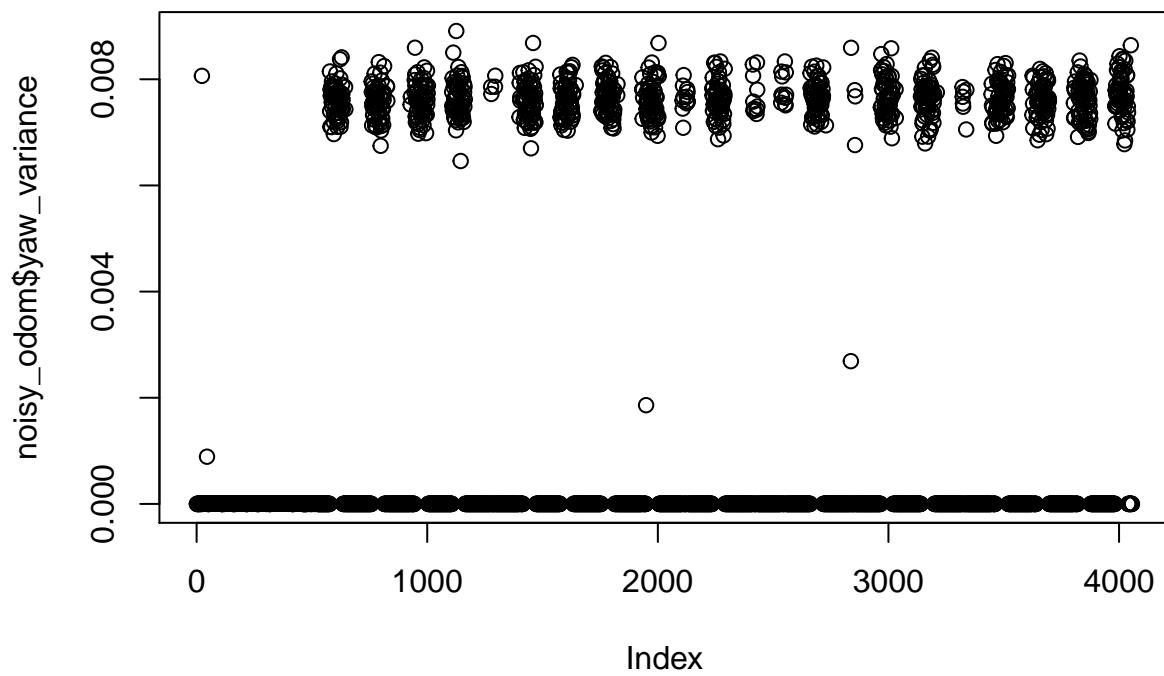
Variance of X Coordinate in Noisy Odometry



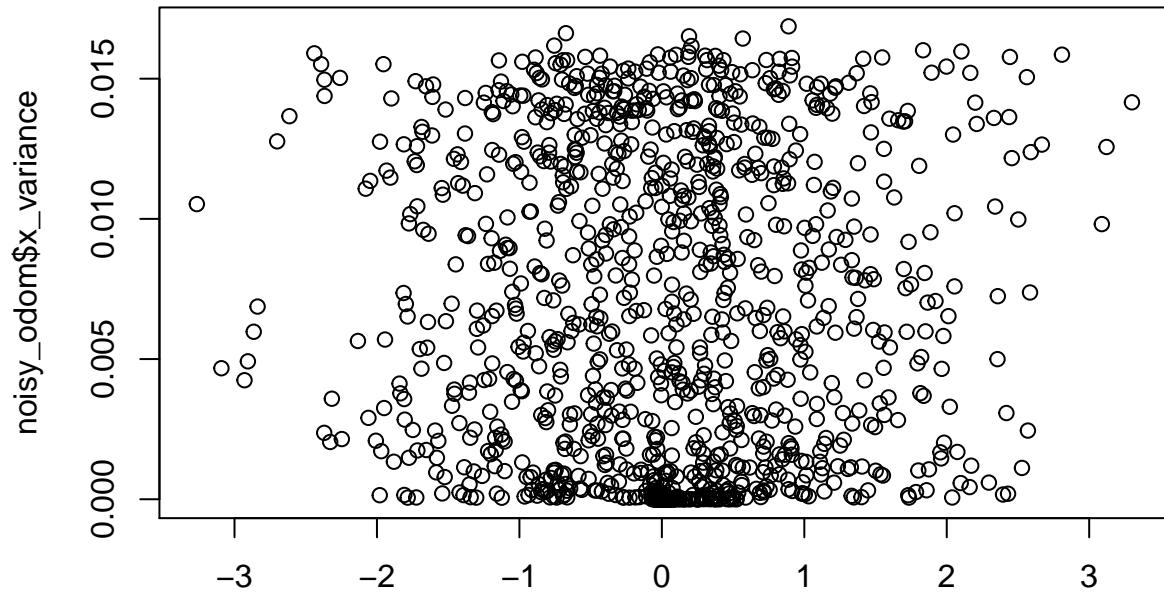
Variance of Y Coordinate in Noisy Odometry



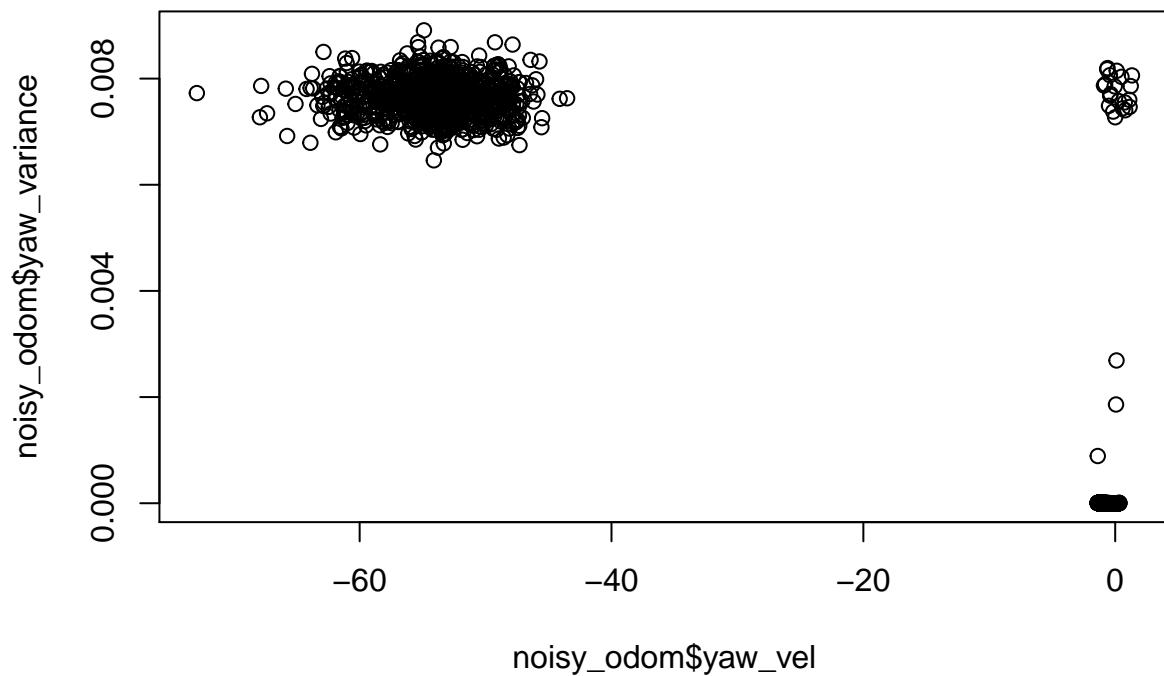
Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry



noisy_odom\$yaw_vel