

one_mobile_noiseless_no_gps Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 6 minutes, and 40.8 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.
## -1.8680 -1.8660  1.5490  0.7197  1.8010  3.9690

summary(continuous$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -4.613   1.154   3.461   1.776   3.761   3.761

summary(continuous$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -3.14100 -1.67400 -0.06331 -0.06767  1.48600  3.13600

summary(continuous$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## 0.000015 3.428000 4.198000 4.107000 4.951000 5.207000

summary(discrete$x_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -1.616  -1.611  1.665   0.840   1.740   3.938

summary(discrete$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -4.638   1.156   3.306   1.740   3.792   3.792

summary(discrete$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -3.13900 -1.66200 -0.05543 -0.04970  1.50500  3.14100

summary(discrete$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## 0.000015 3.407000 4.120000 4.064000 4.953000 5.164000

summary(noisy_odom$x_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.     Max.
## -2.3520 -1.7260 -1.0830 -0.7106  0.3909  0.7434
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -0.88380 -0.25410  0.02151  0.06495  0.35380  1.49600

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.0000289 0.4723000 1.1220000 1.1070000 1.8480000 2.4530000

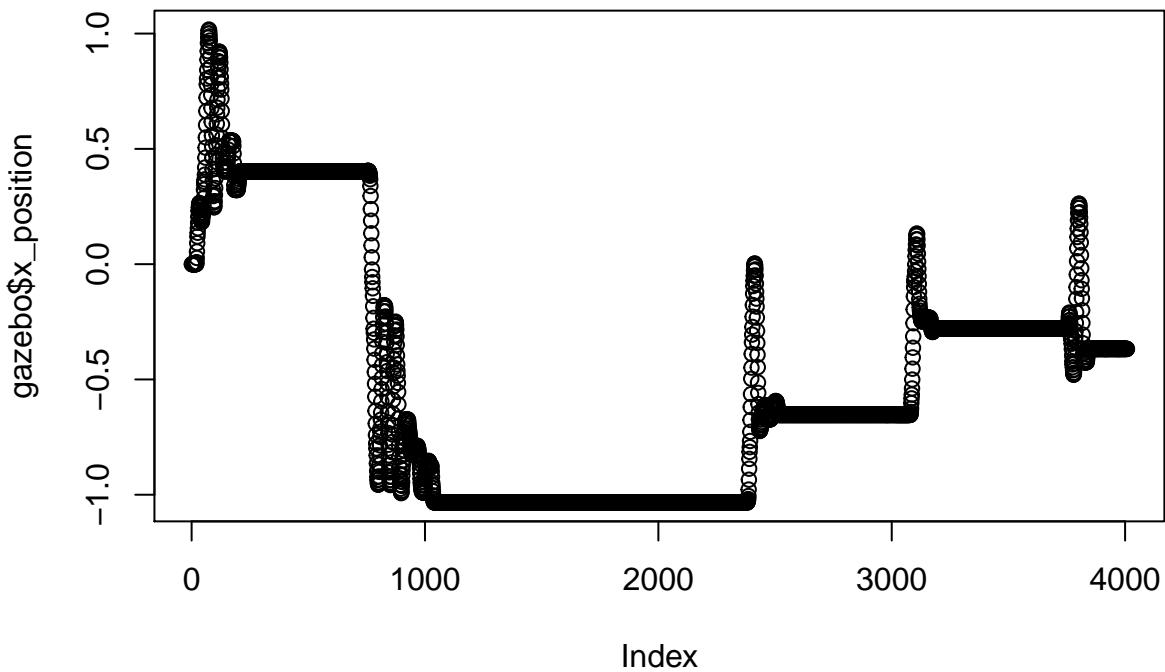
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

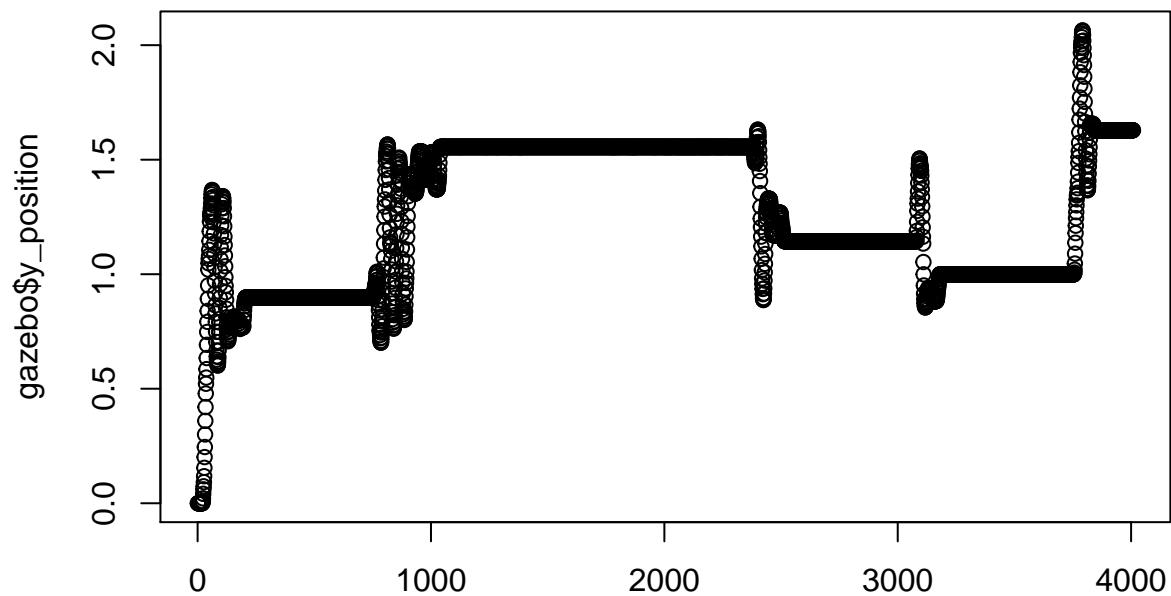
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000e+00 1.646e-06 3.731e-06 6.090e-04 5.295e-06 8.536e-03

```

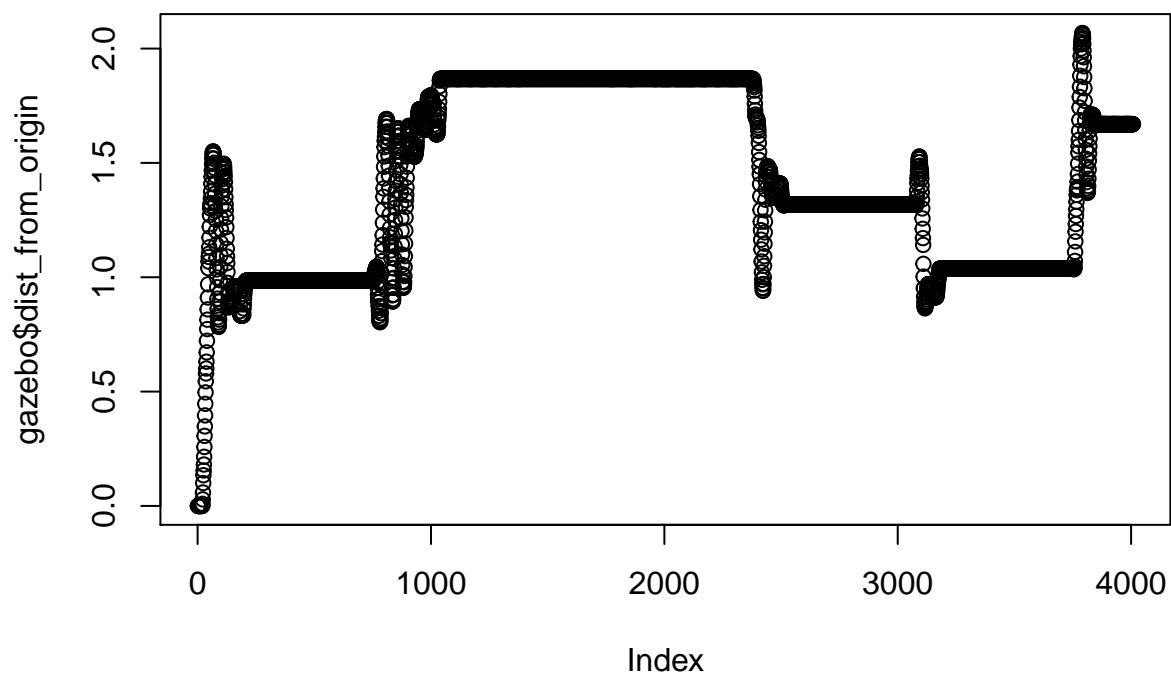
X coordinate of robot over time



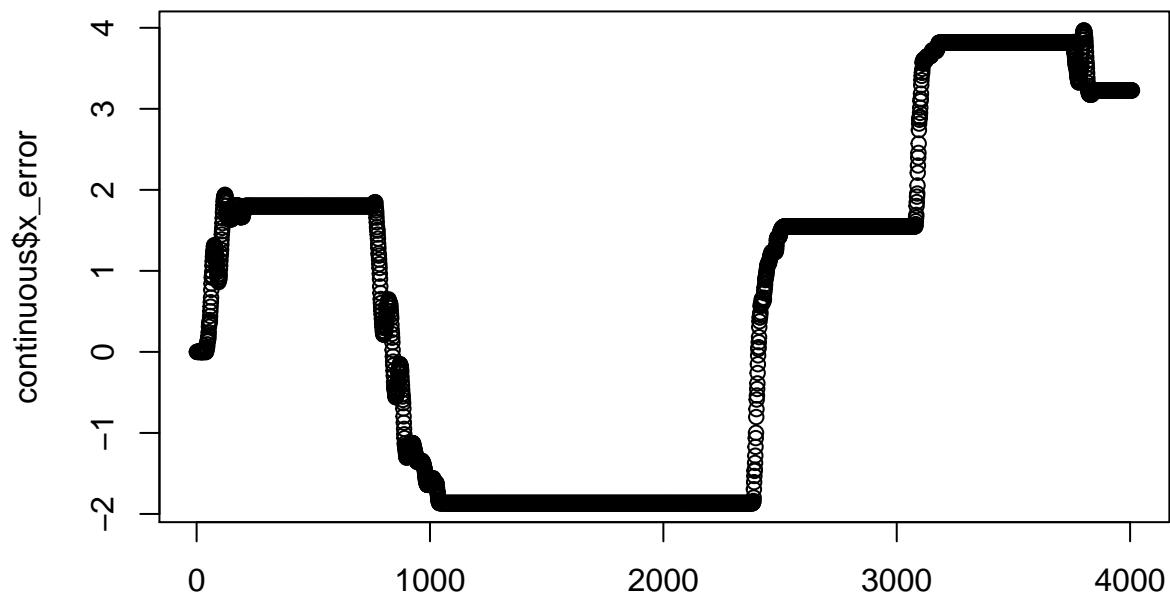
Y coordinate of robot over time



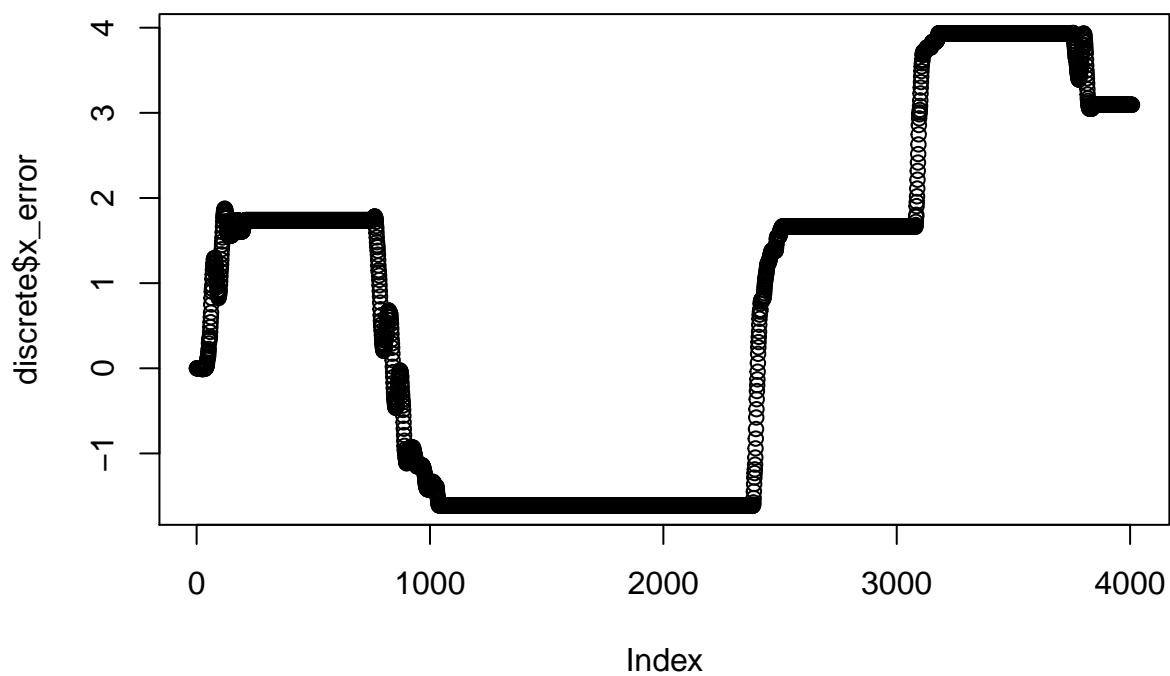
Distance from origin vs. time^{Index}



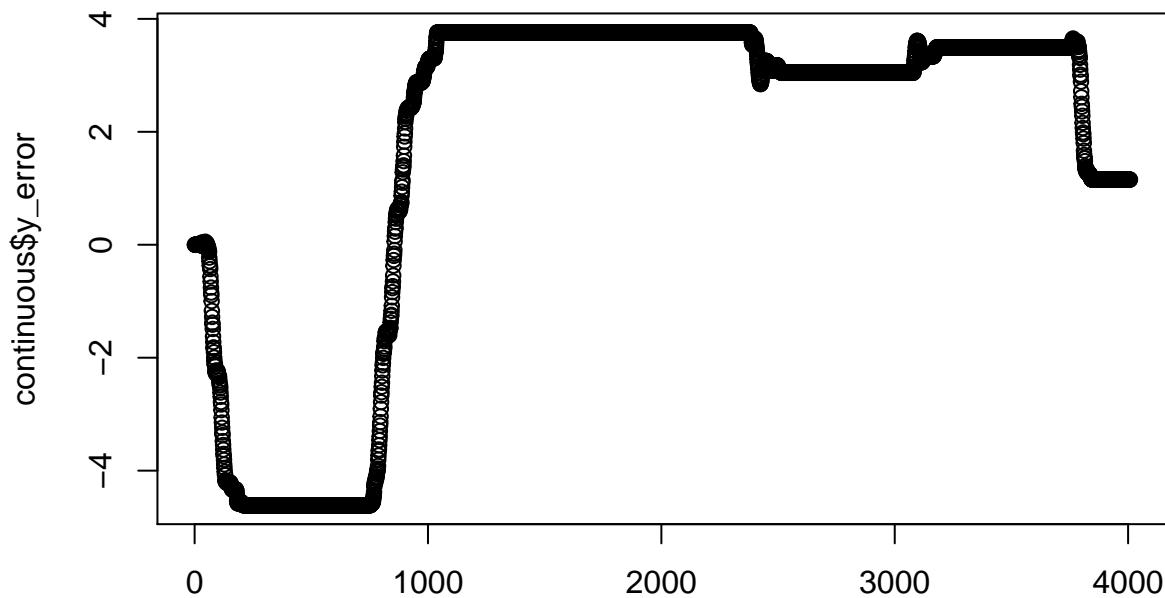
Continuous x_error over time



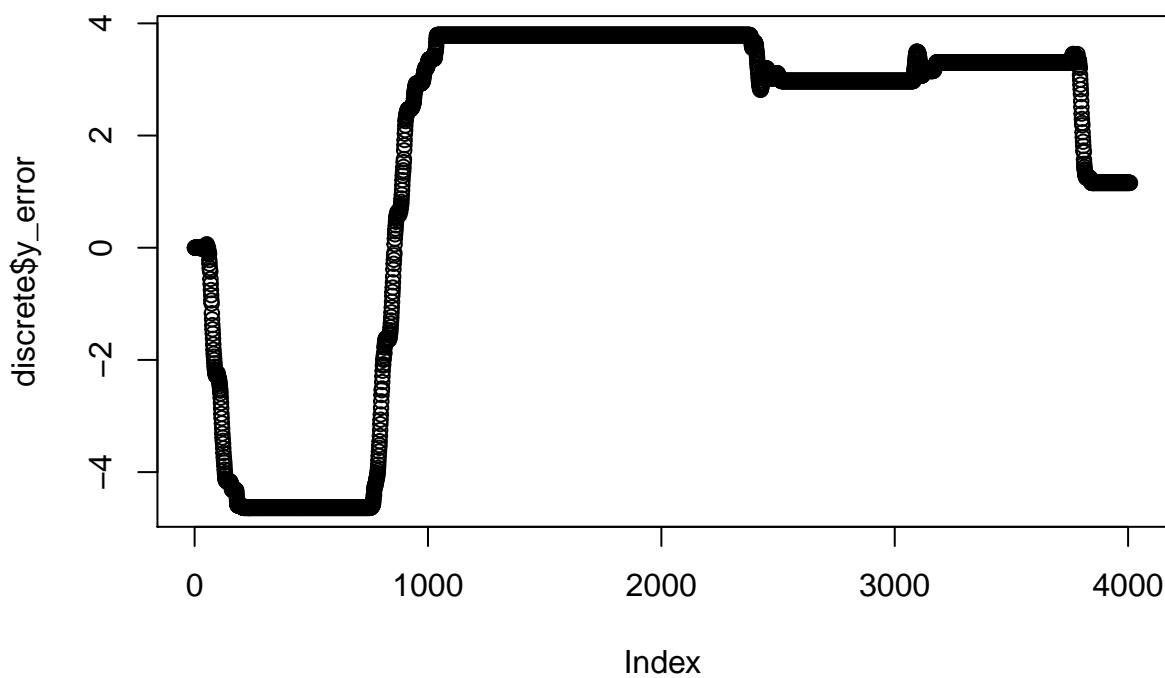
Discrete x_error over time



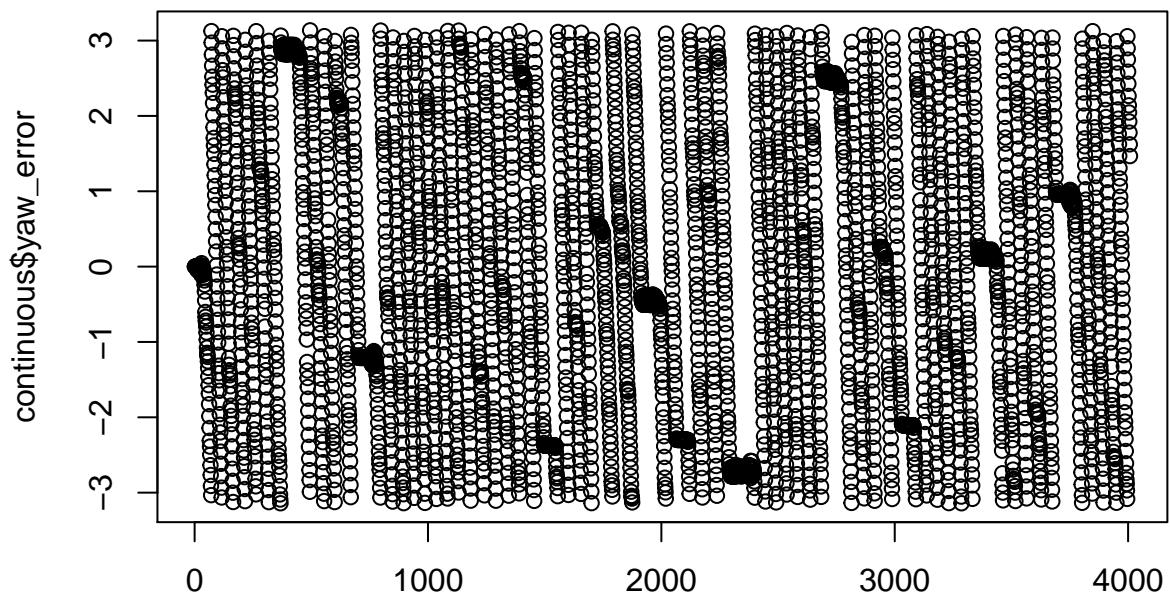
Continuous y_error over time



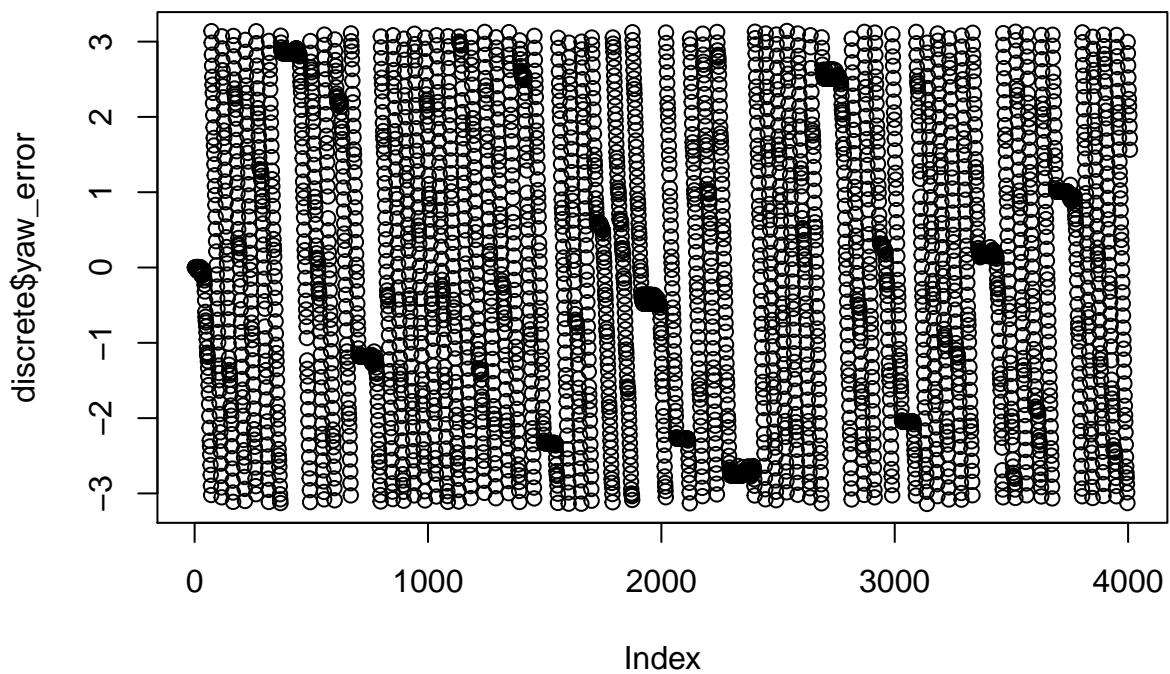
Discrete y_error over time



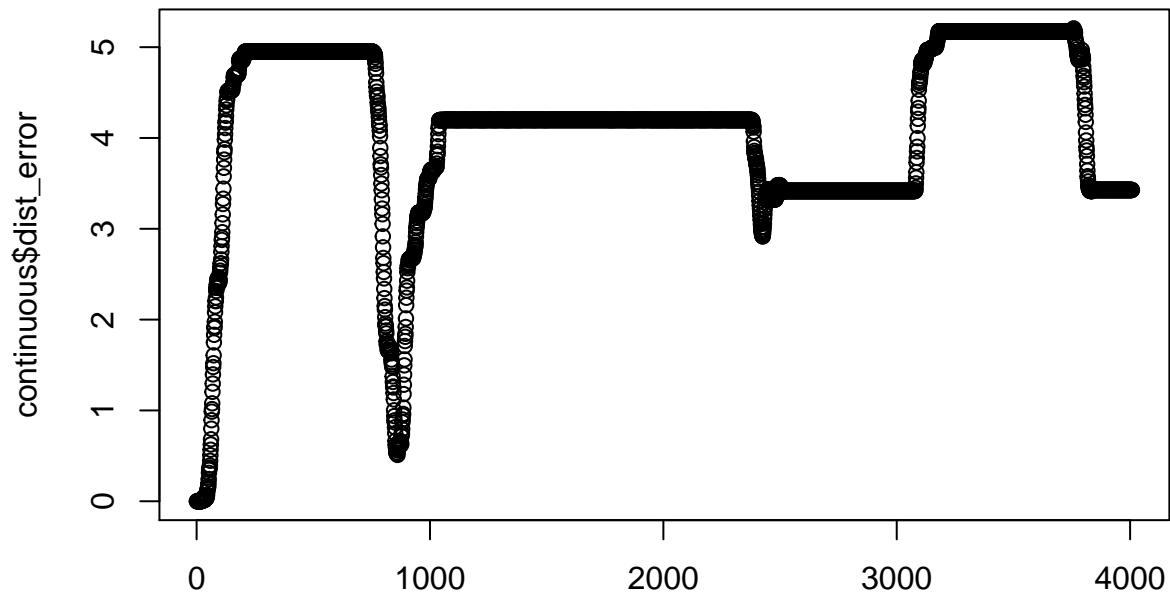
Continuous yaw error over time



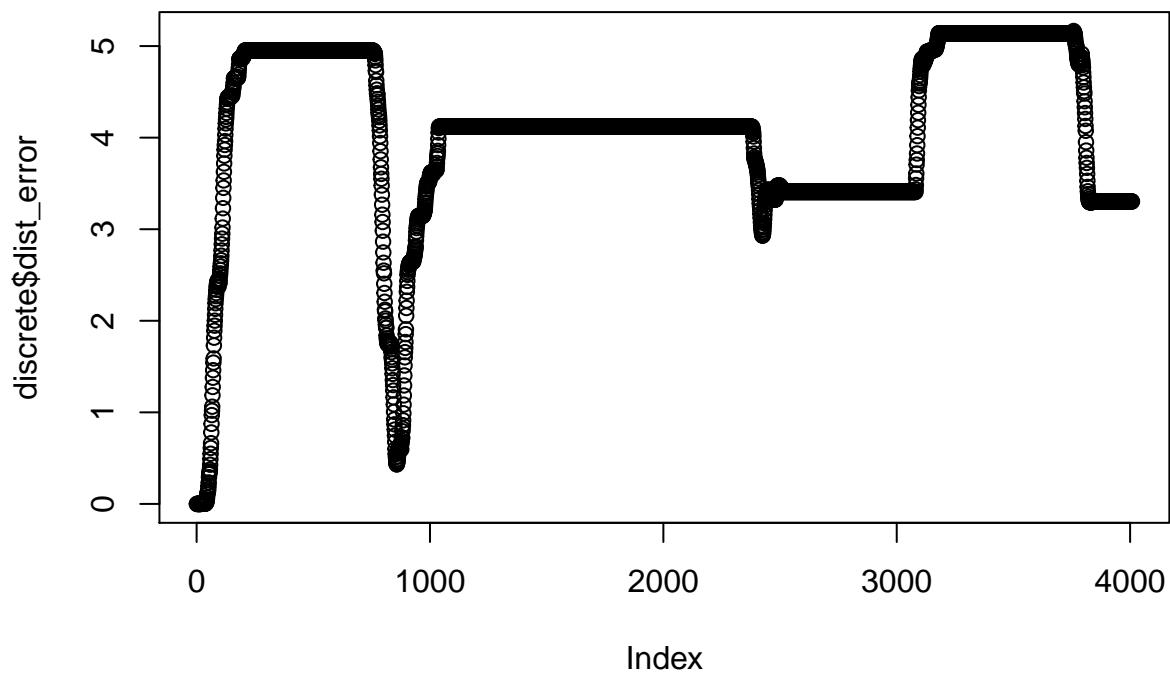
Discrete yaw error over time



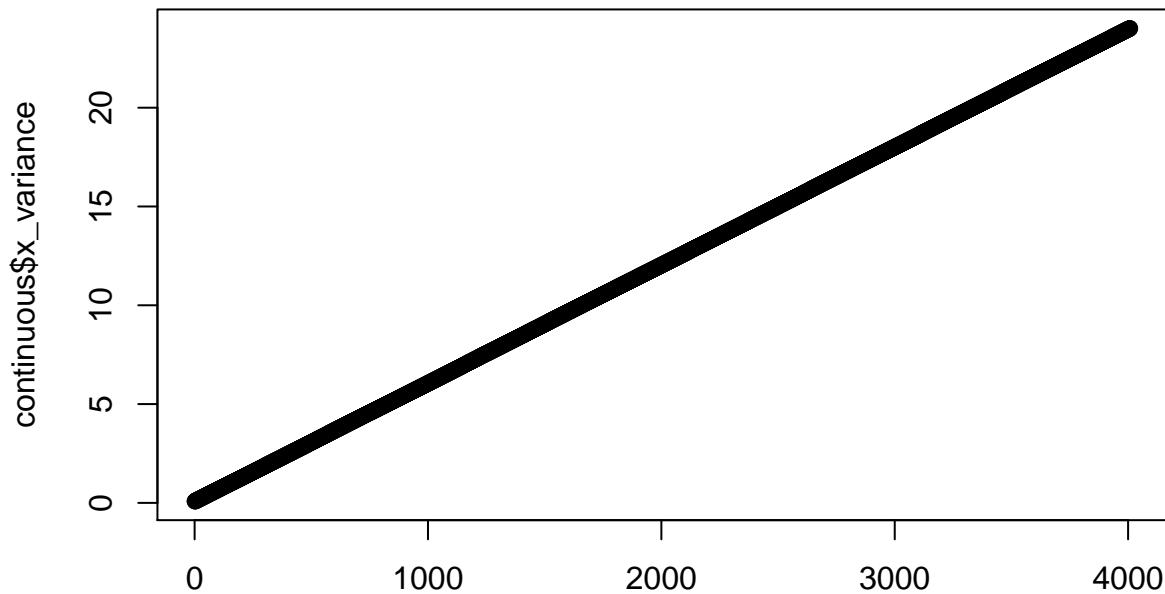
Continuous total distance error over time



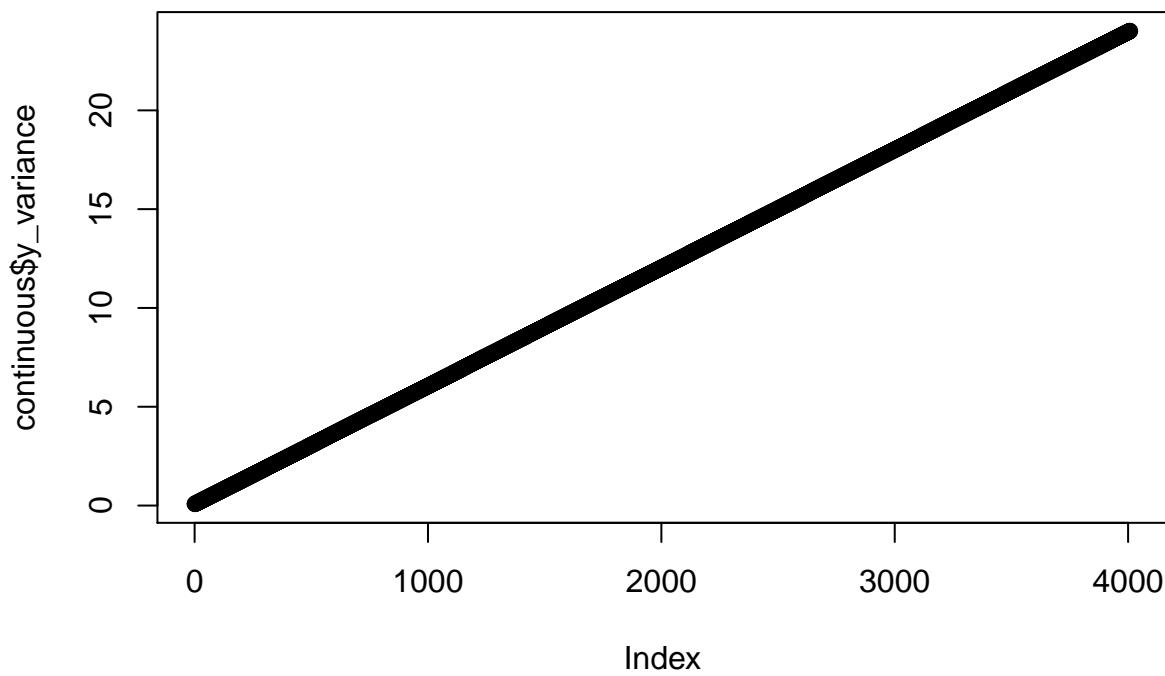
Discrete total distance error over time



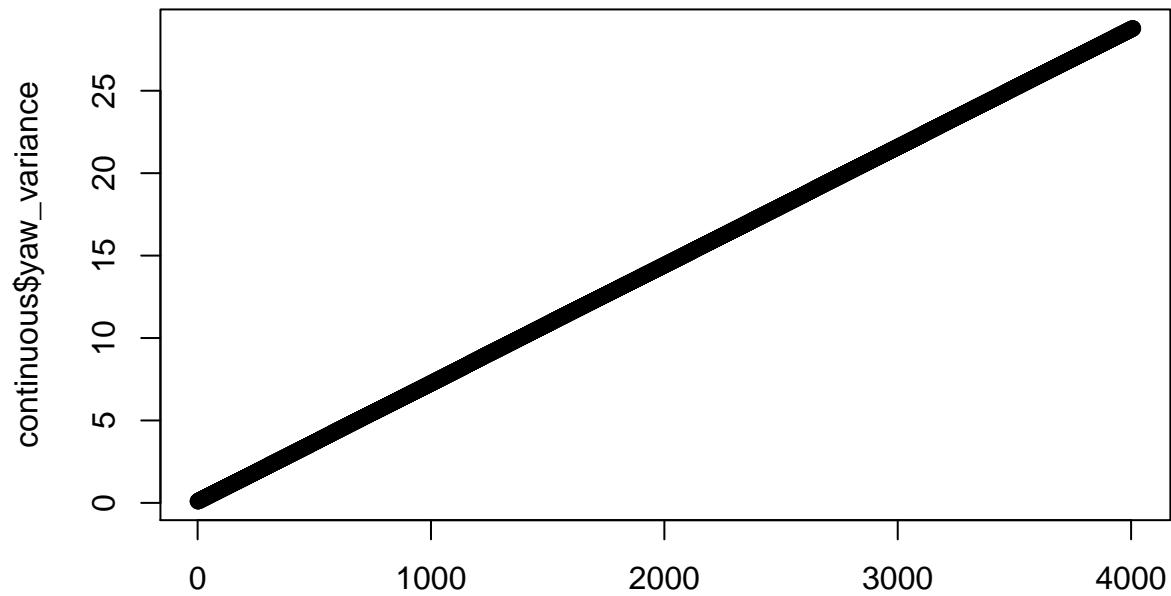
Continuous Filter X Variance Over Time



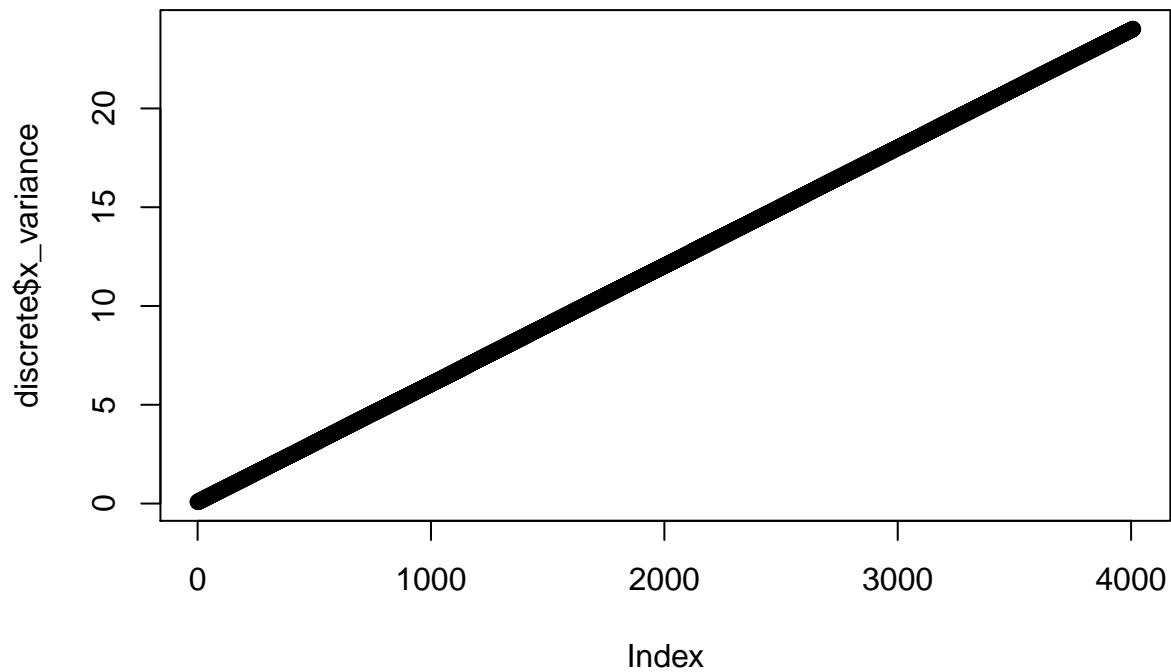
Continuous Filter Y Variance Over Time



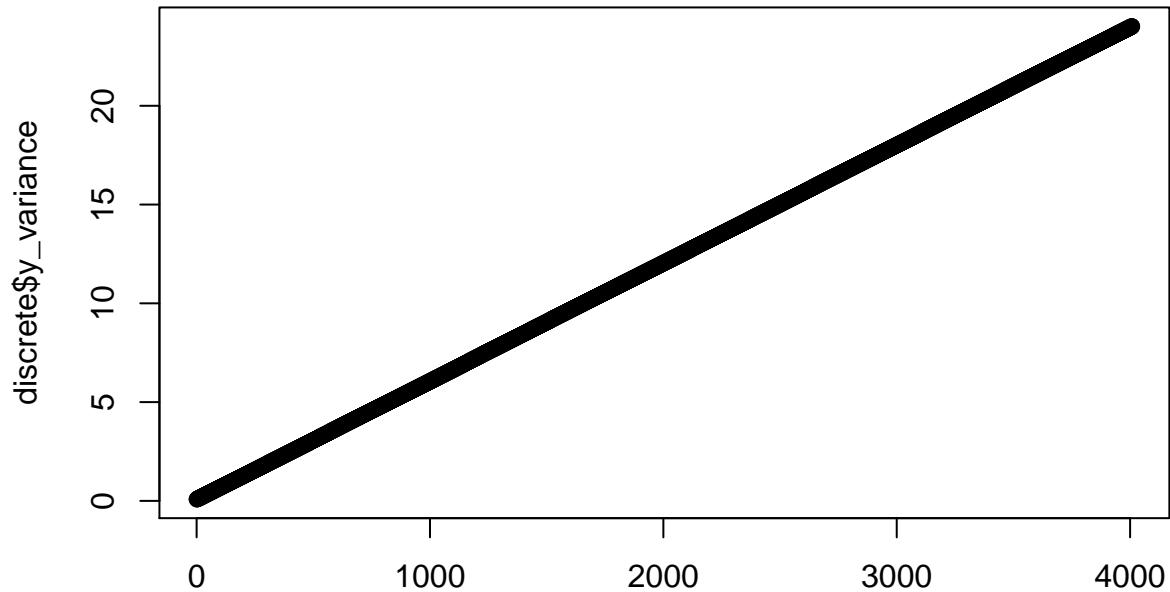
Continuous Filter Yaw Variance Over Time



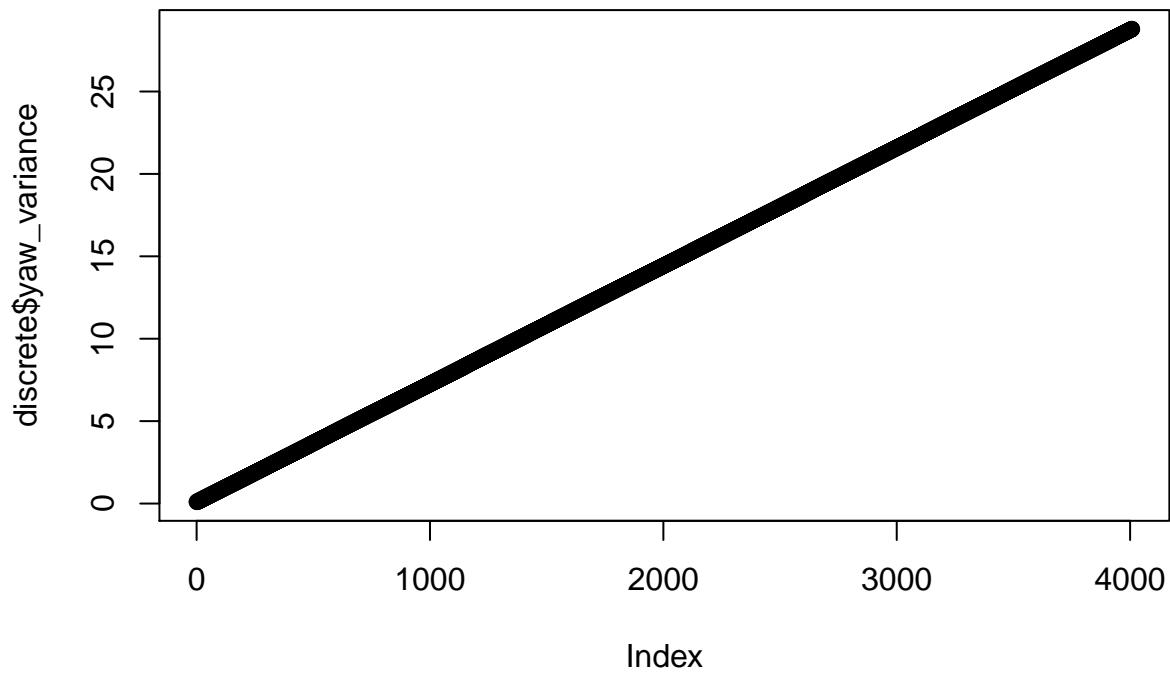
Discrete Filter X Variance Over Time



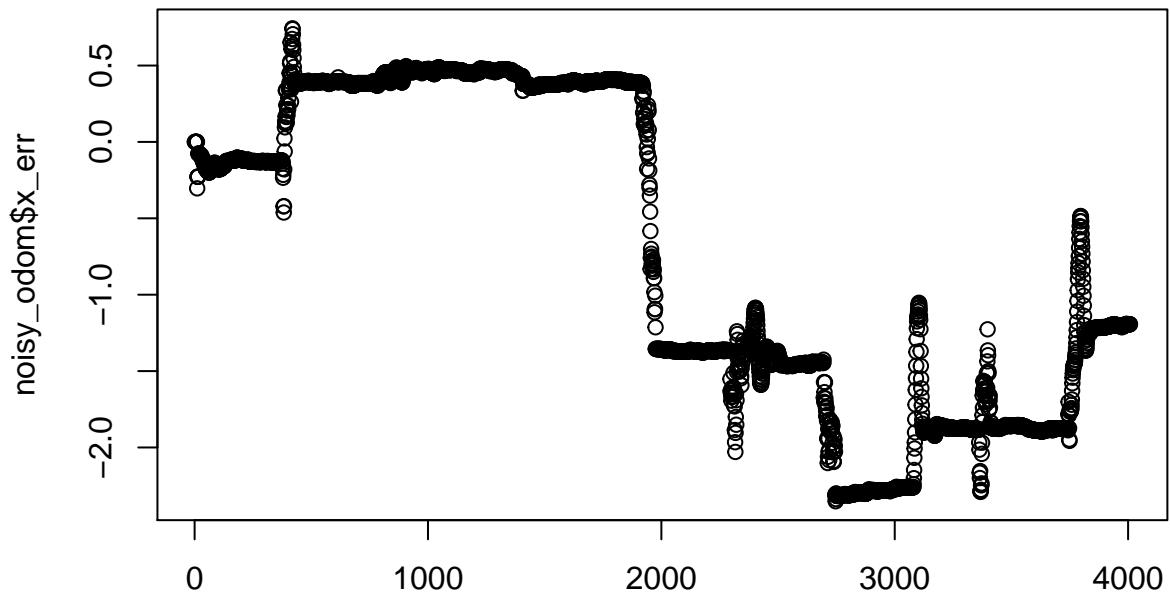
Discrete Filter Y Variance Over Time



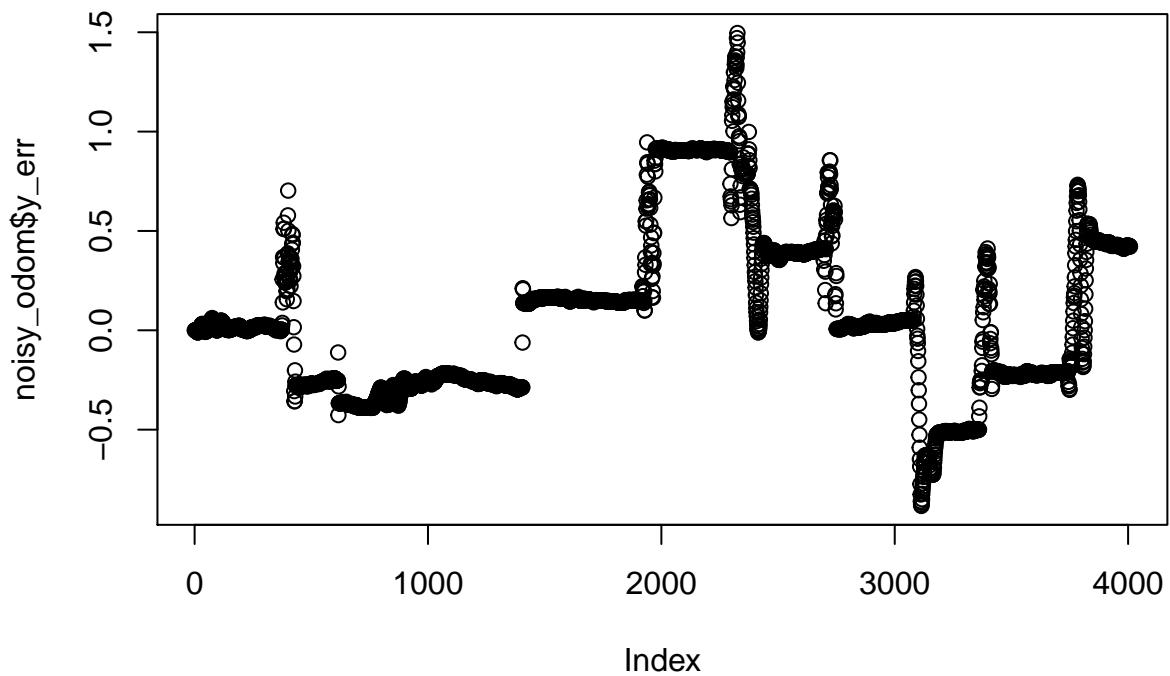
Discrete Filter Yaw Variance Over Time



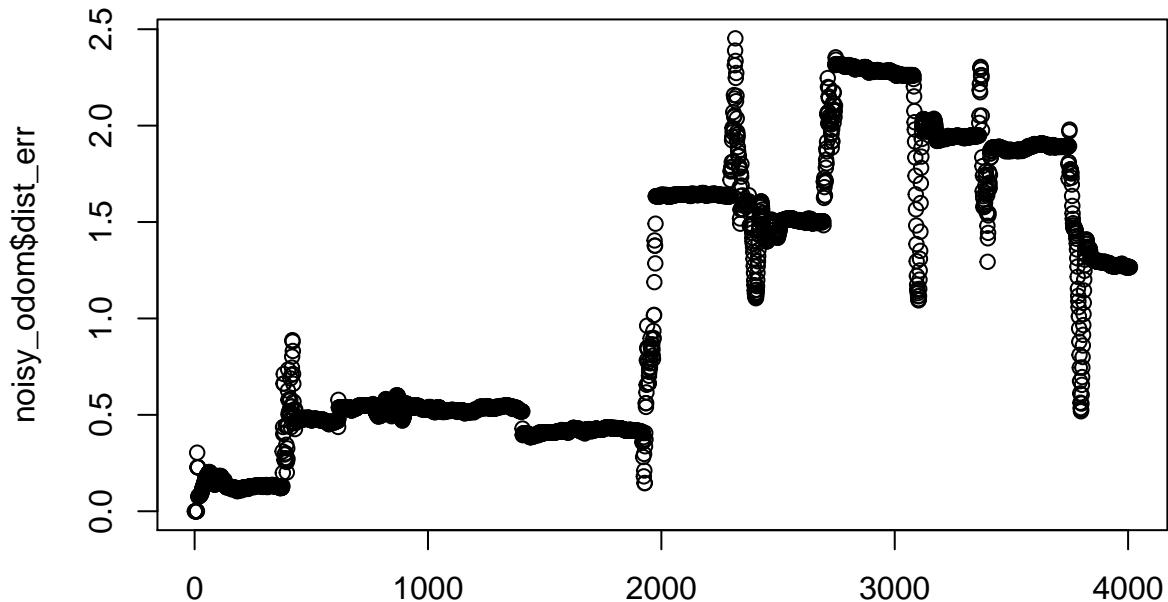
Noisy Odom X Error Over Time



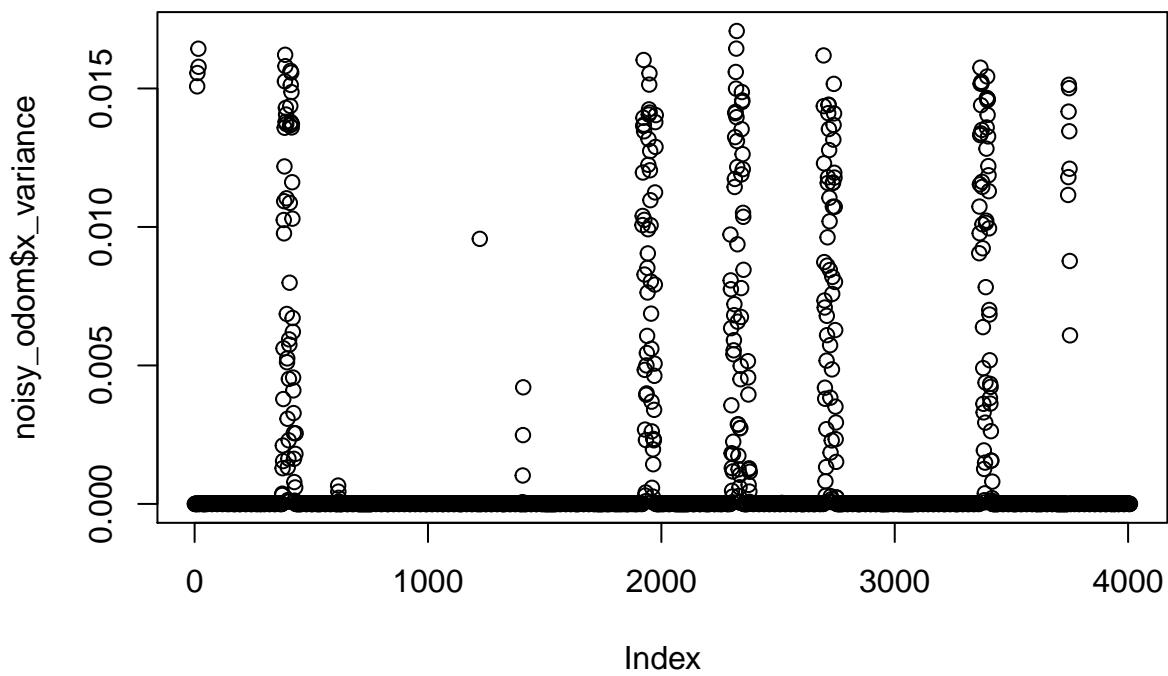
Noisy Odom Y Error Over Time



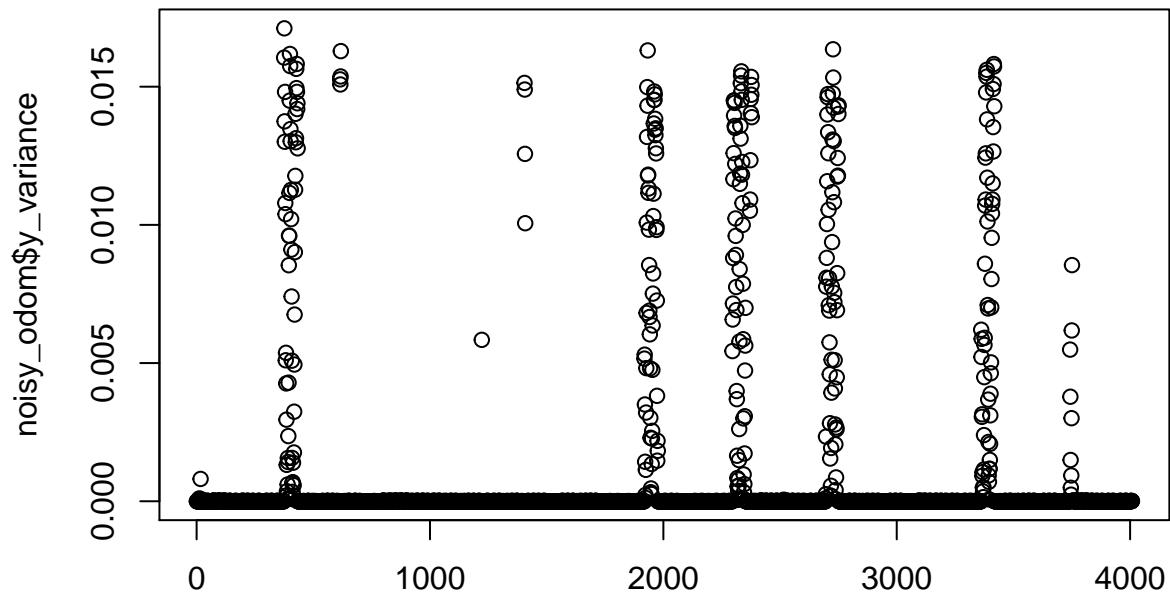
Noisy Odom Horizontal Distance Error Over Time



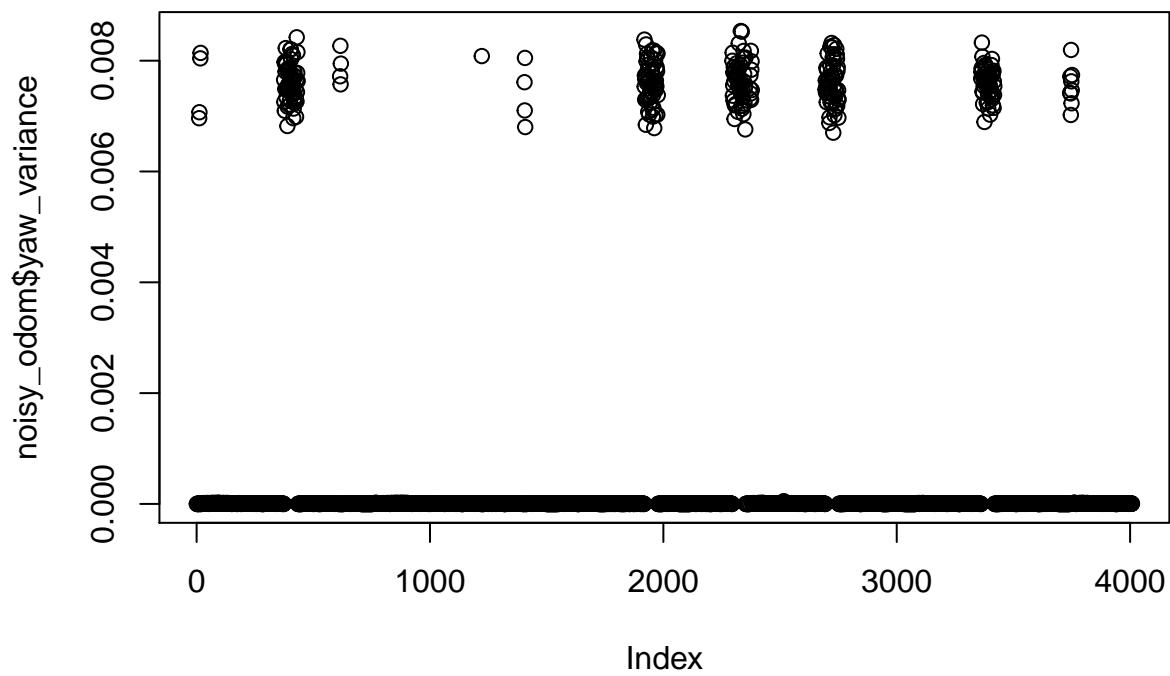
Variance of X Coordinate in Noisy Odometry



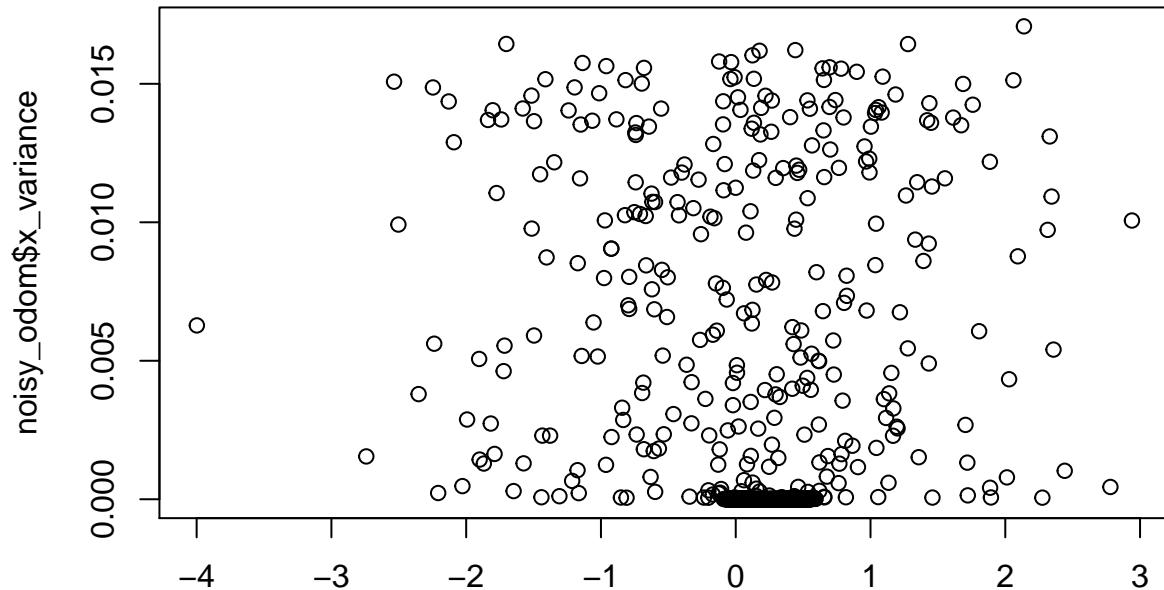
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

