

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, 5 minutes, and 39.8 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.
## -0.004862 3.783000 5.338000 6.154000 7.521000 13.650000

summary(continuous$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -0.7707 15.8300 17.0600 15.9000 18.4500 20.7100

summary(continuous$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -3.14000 -1.48000 0.11110 0.08775 1.76300 3.14100

summary(continuous$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## 0.000015 16.170000 17.630000 17.320000 20.180000 24.380000

summary(discrete$x_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -2.88300 -0.21160 0.01741 0.14800 0.49280 3.20800

summary(discrete$y_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -4.52400 -0.41990 -0.08207 -0.13470 0.11050 3.90600

summary(discrete$yaw_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -3.1360 -1.3890 -0.7281 -0.4204 0.2492 3.1400

summary(discrete$dist_error)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## 0.000015 0.225800 0.541400 0.922200 1.325000 4.846000

summary(noisy_odom$x_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.      Max.
## -2.01400 -0.56330 -0.26400 -0.25650 0.01805 1.15900
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -0.3000  0.1593  0.3281  0.8482  1.6260  3.0090

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.0000042 0.4164000 0.7160000 1.0860000 2.0390000 3.0980000

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

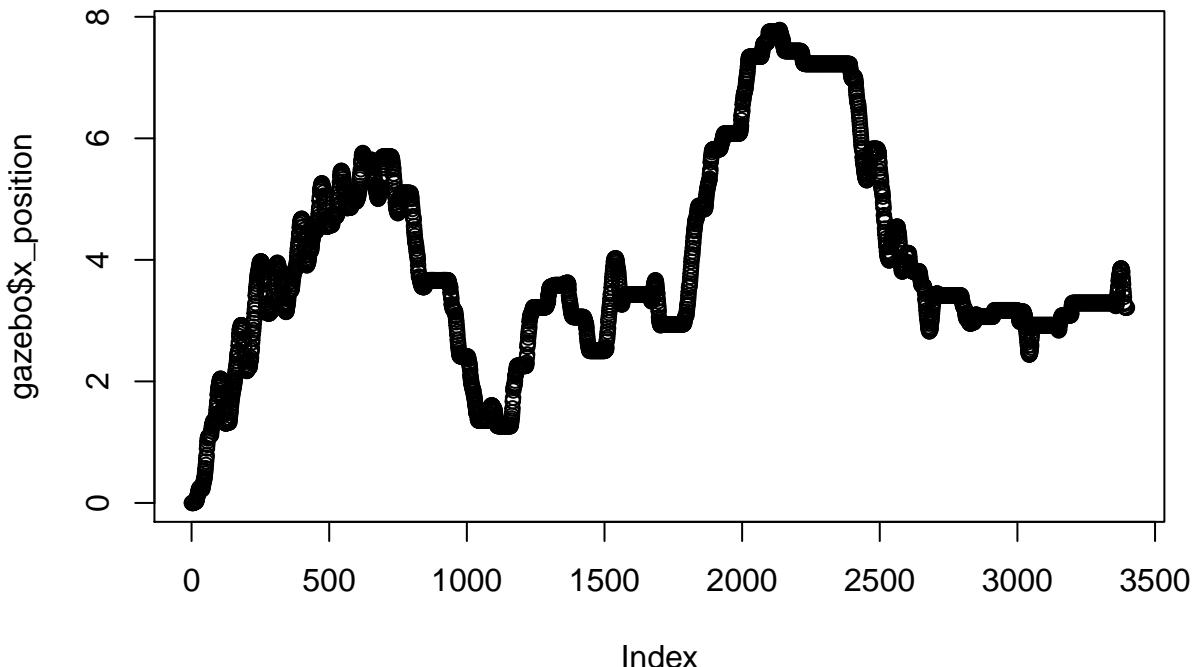
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 1.746   7.864   8.747   8.465  10.000  11.900

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

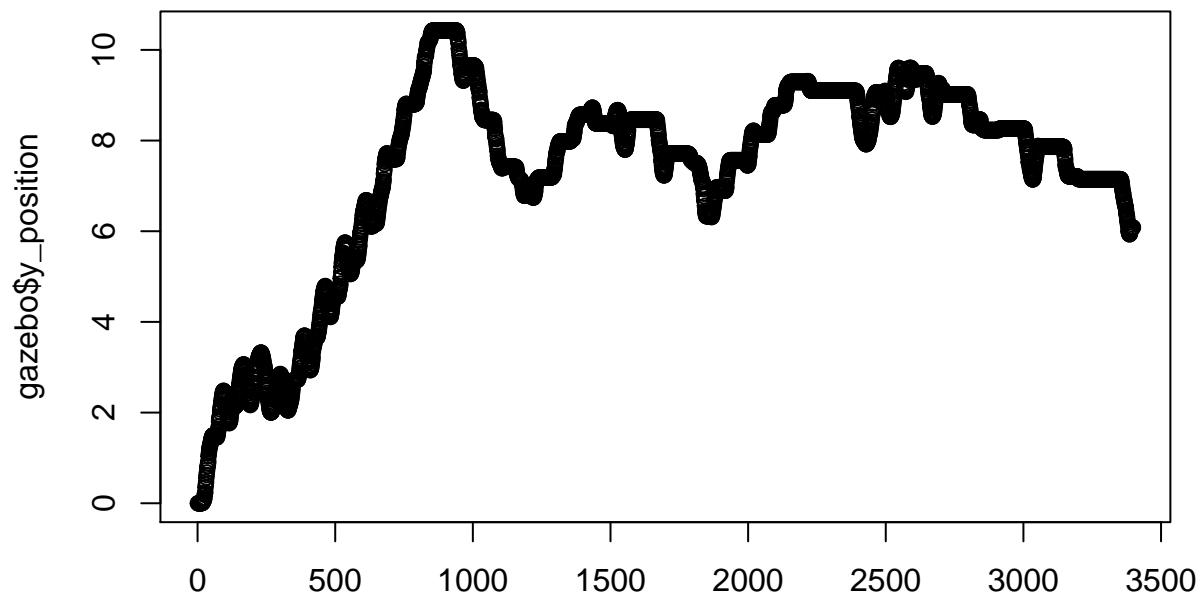
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000e+00 2.021e-06 4.350e-06 2.480e-04 7.229e-06 8.675e-03

```

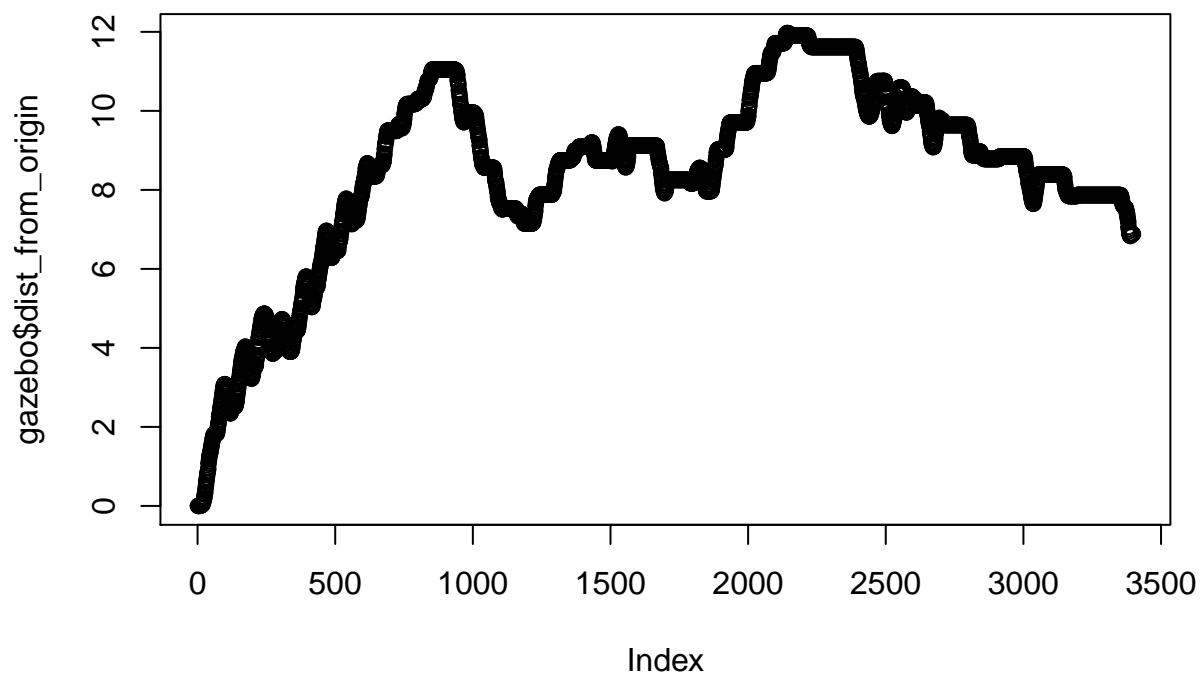
X coordinate of robot over time



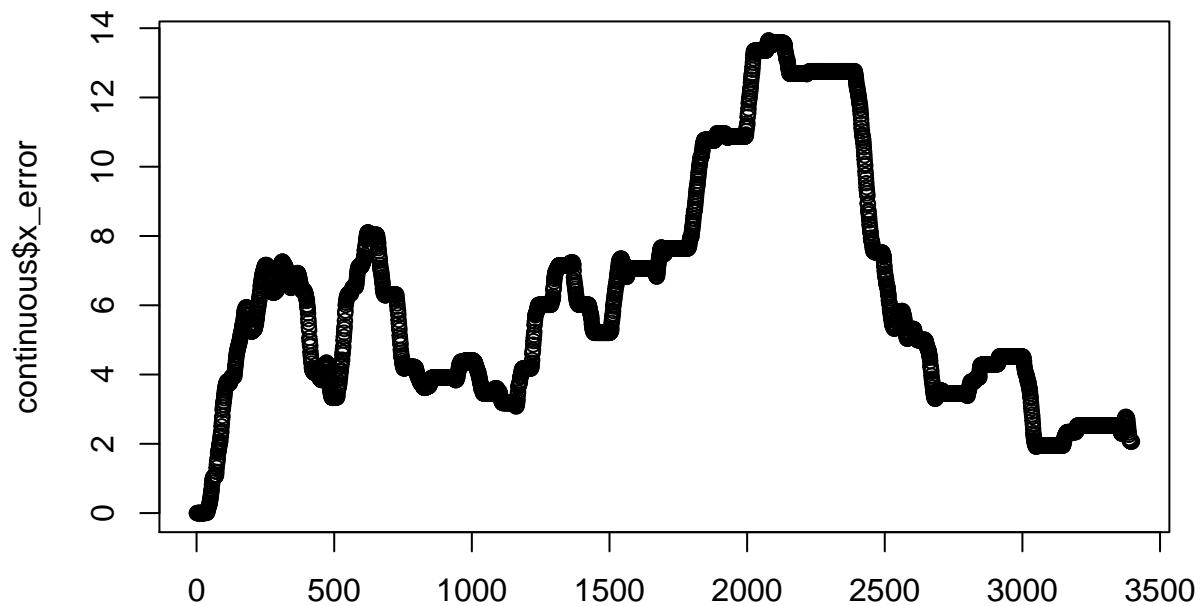
Y coordinate of robot over time



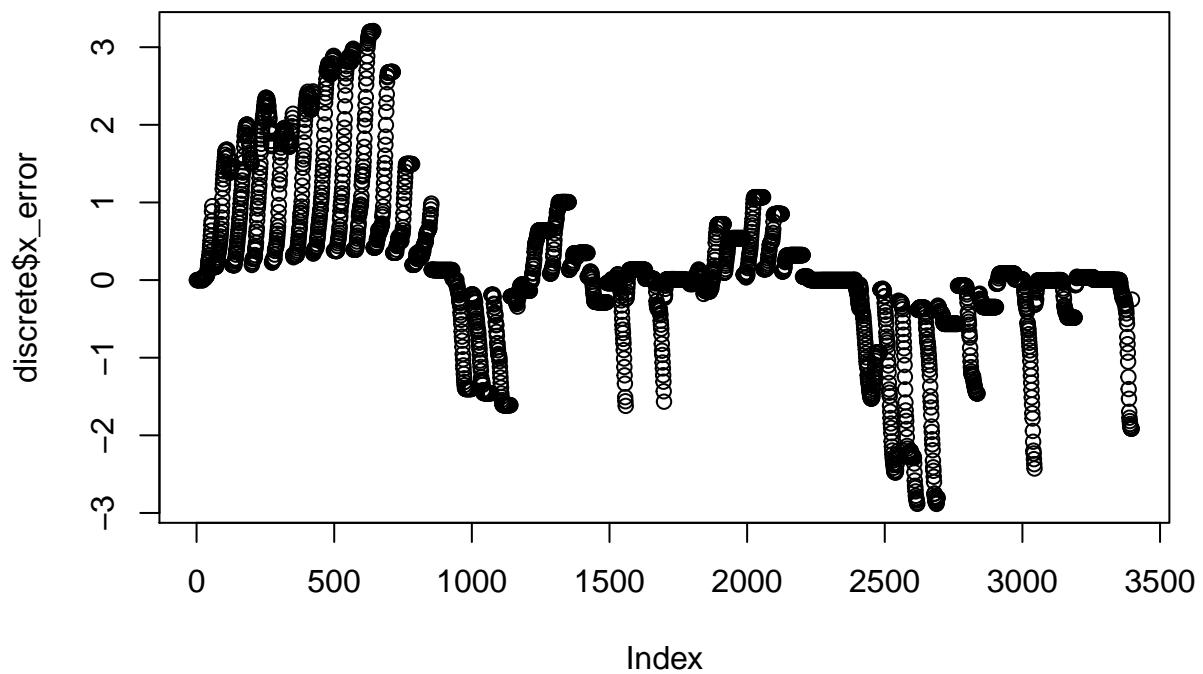
Distance from origin vs. time



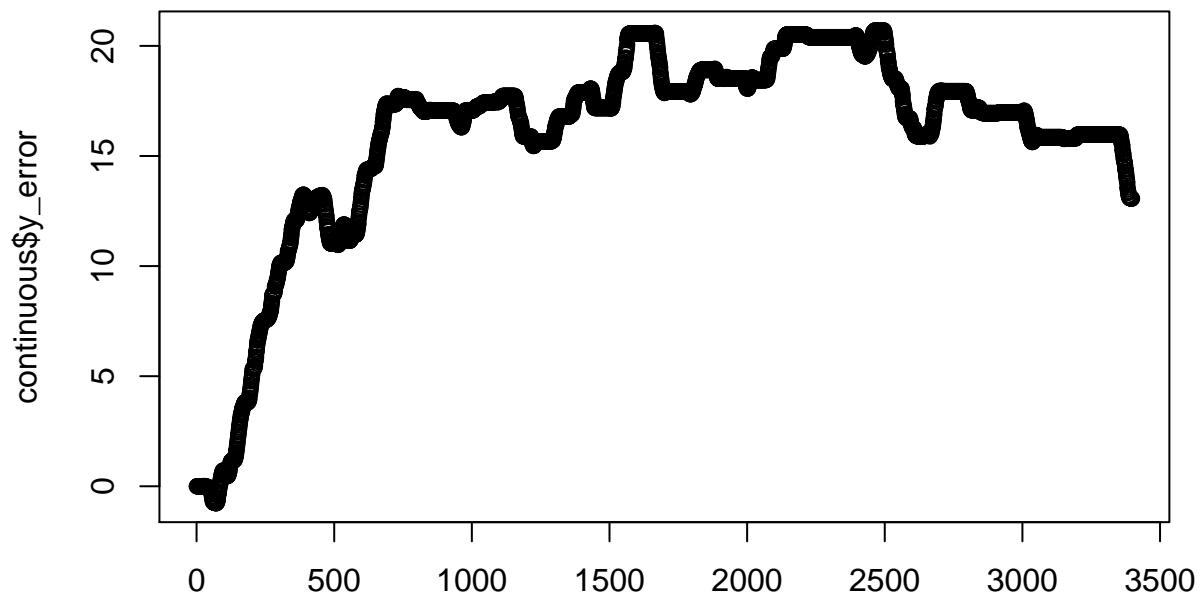
Continuous x_error over time



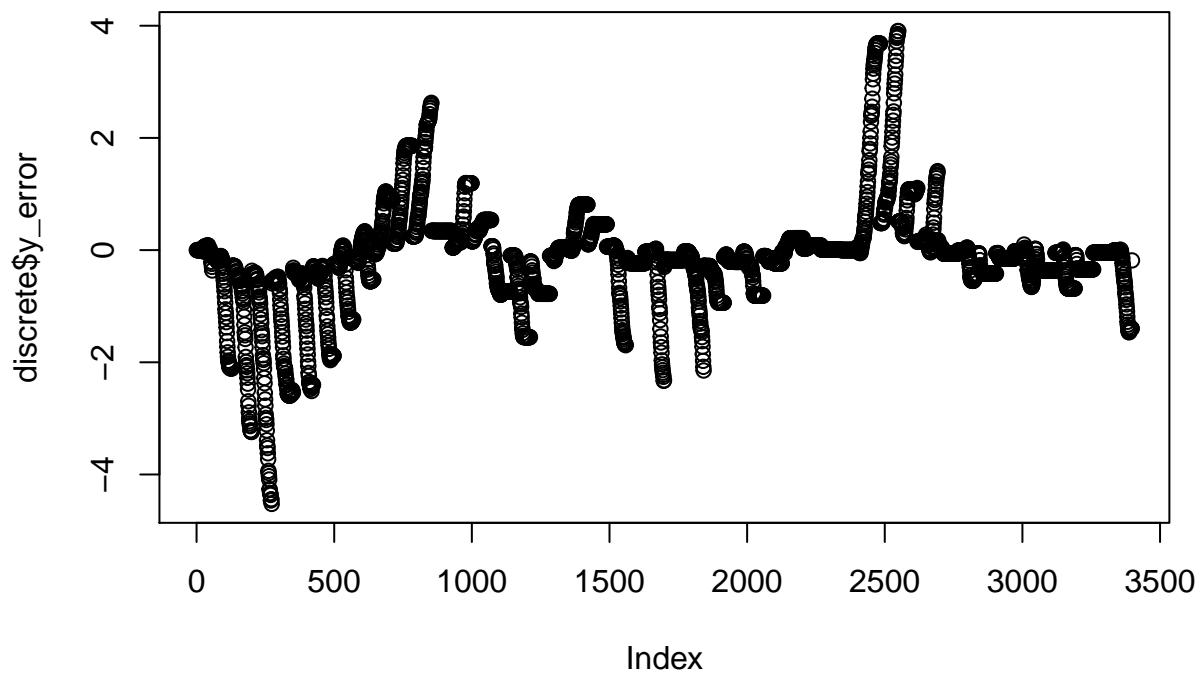
Discrete x_error over time



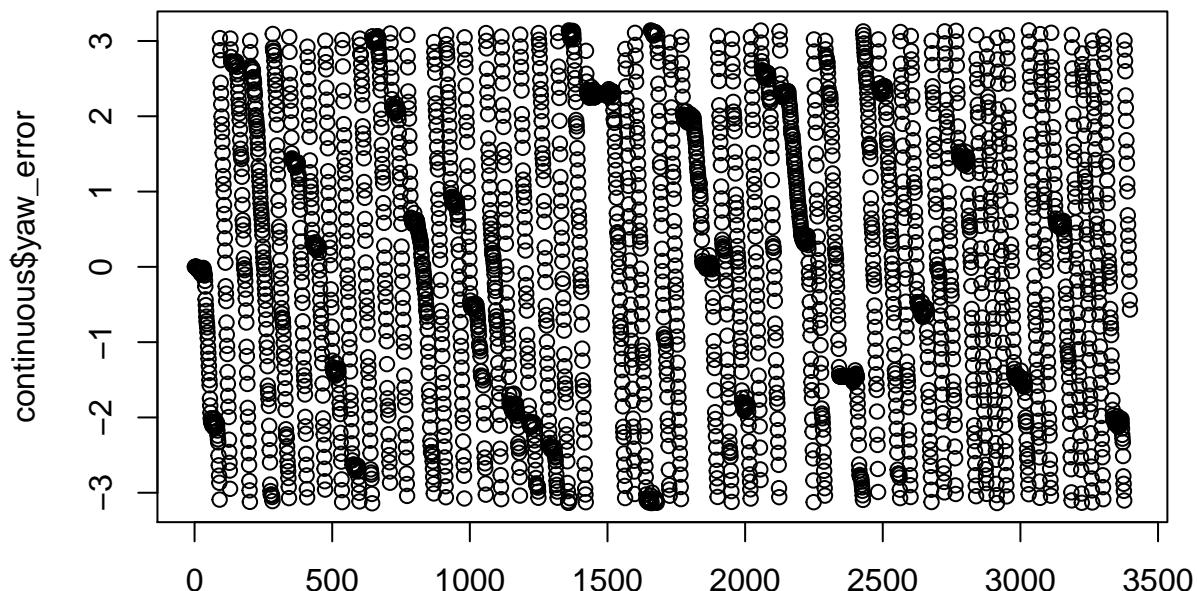
Continuous y_error over time



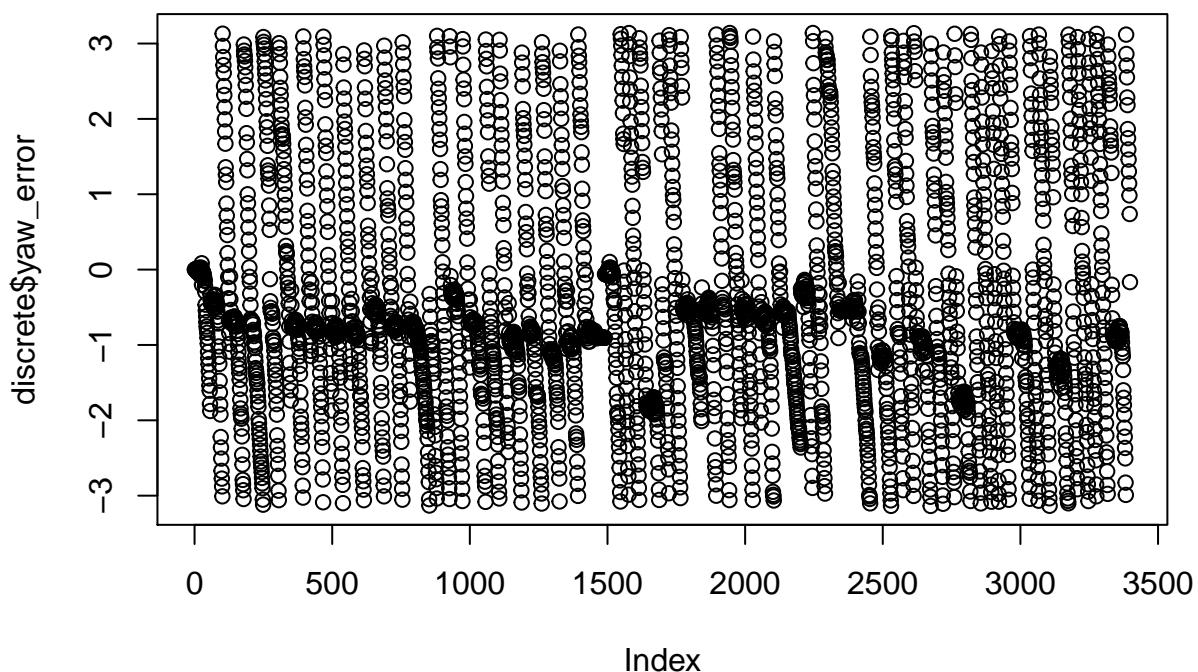
Discrete y_error over time



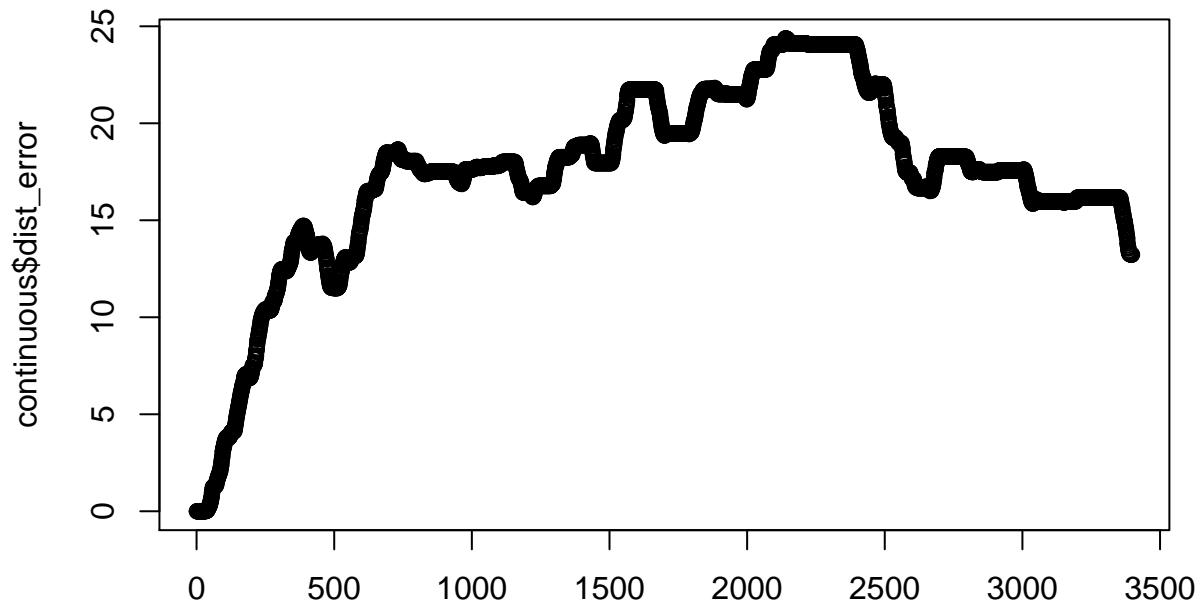
Continuous yaw error over time



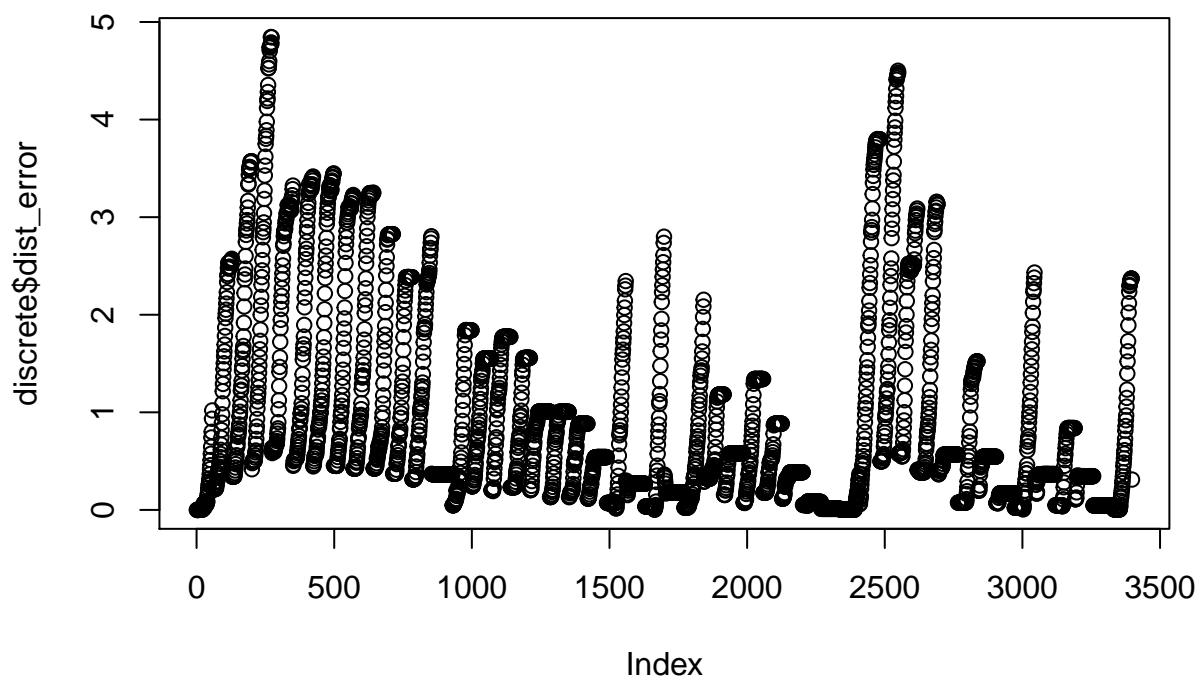
Discrete yaw error over time



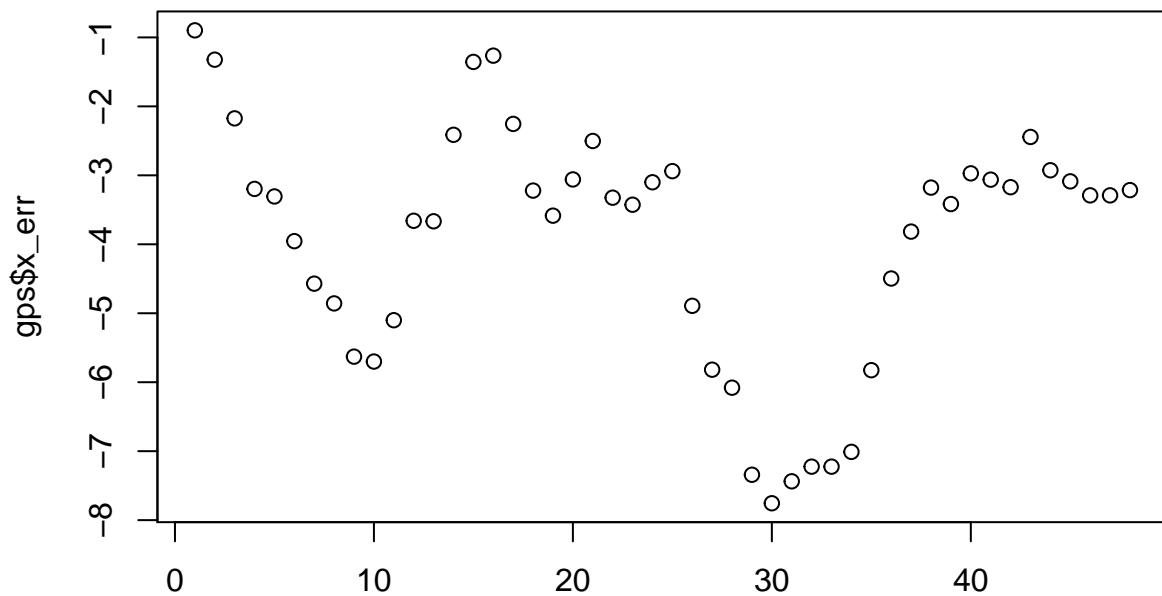
Continuous total distance error over time



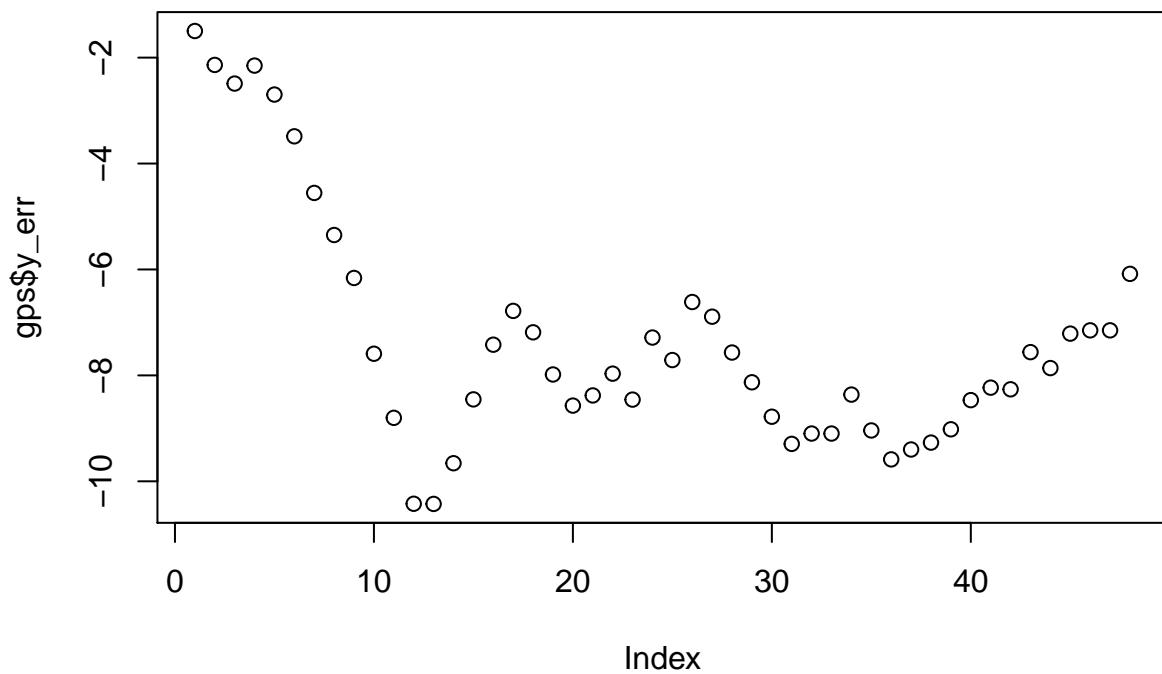
Discrete total distance error over time



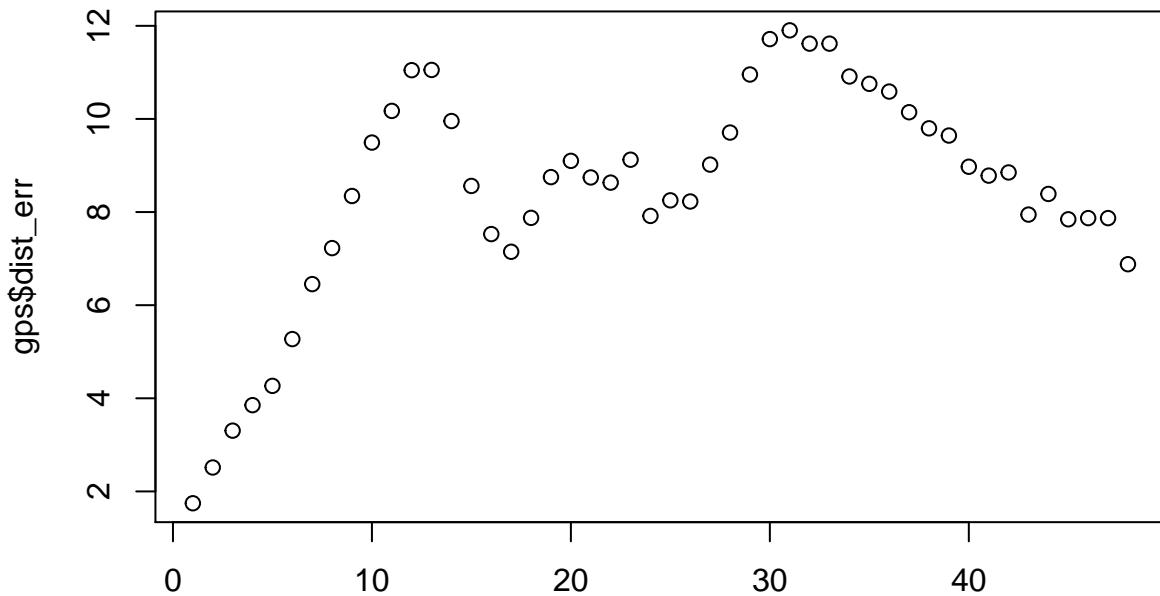
GPS X Error Over Time



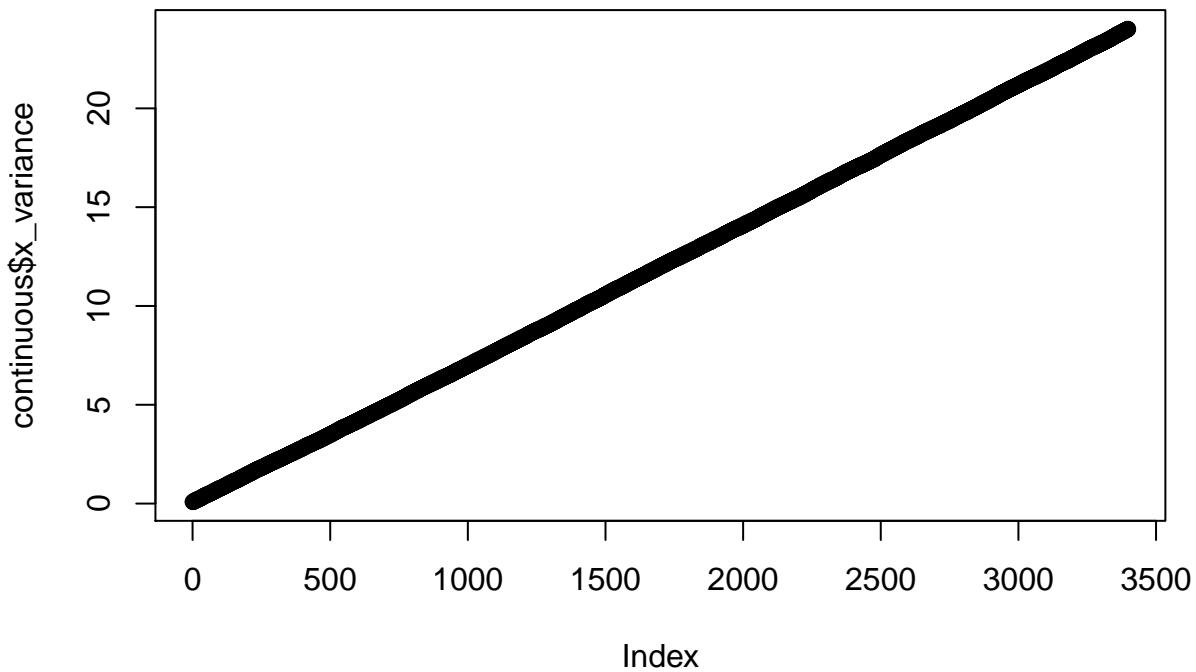
GPS Y Error Over Time



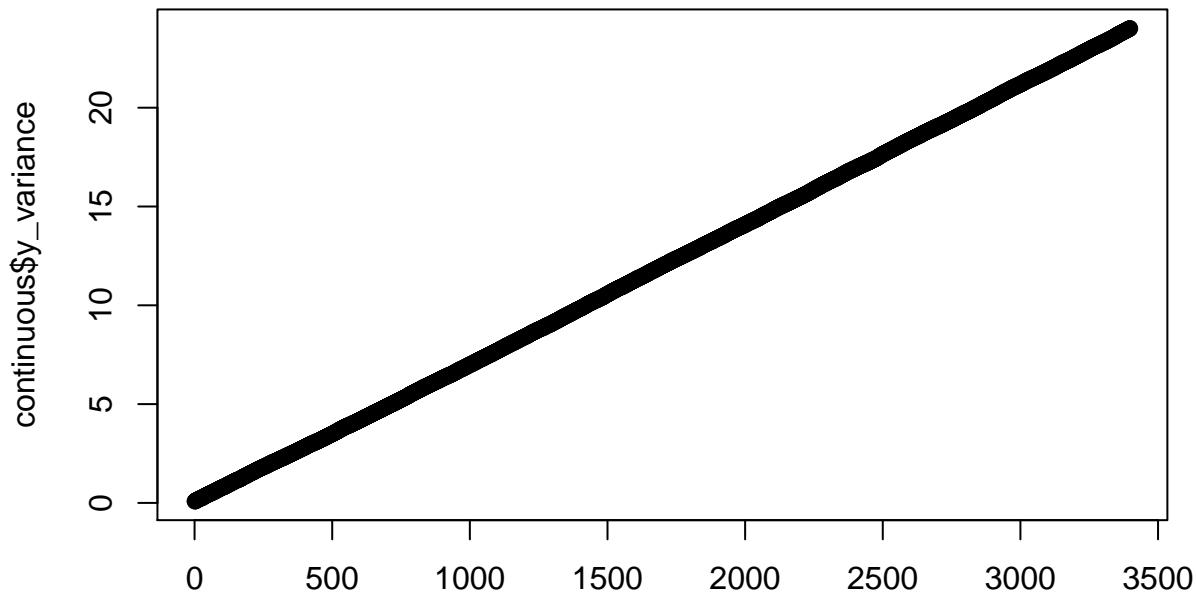
GPS Horizontal Distance Error Over Time



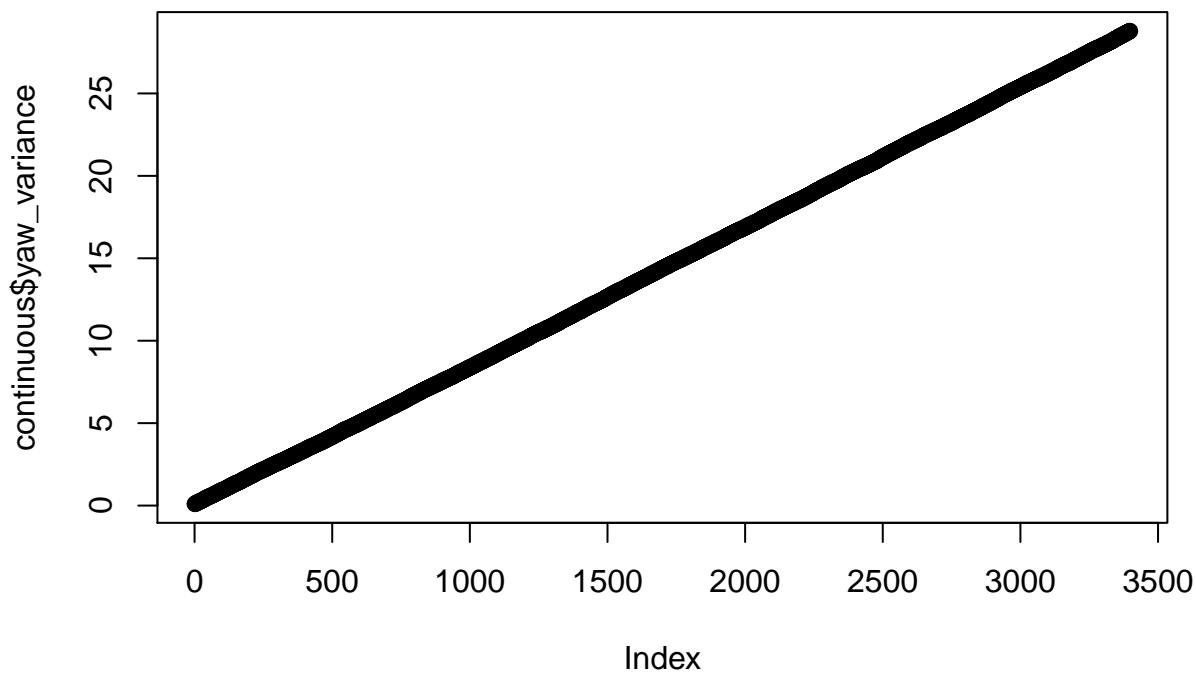
Continuous Filter X Variance Over Time



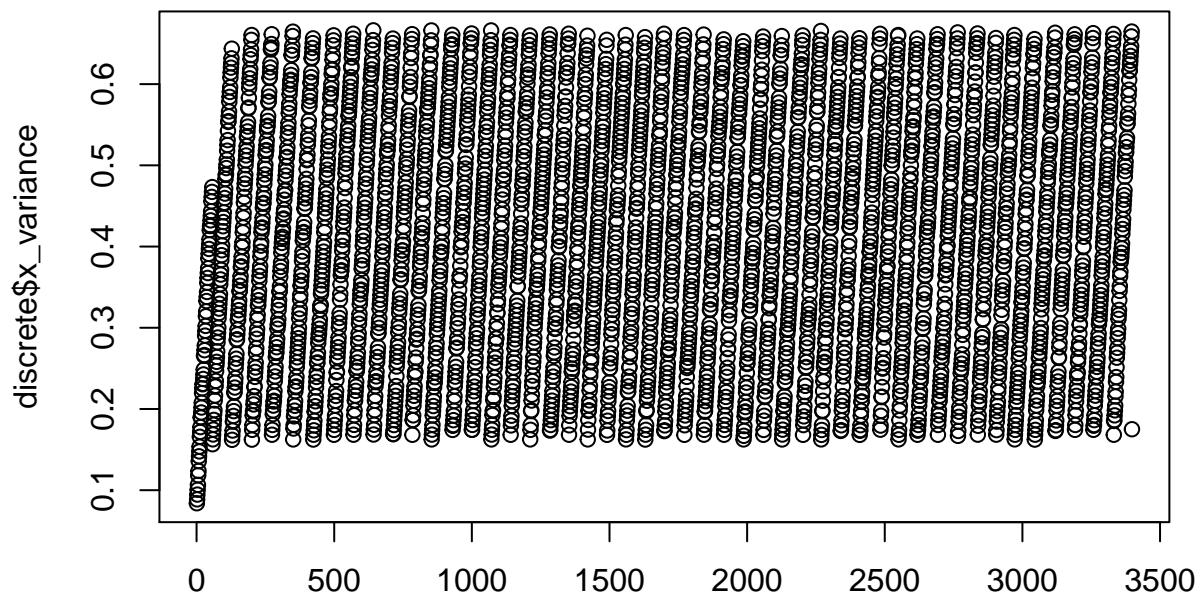
Continuous Filter Y Variance Over Time



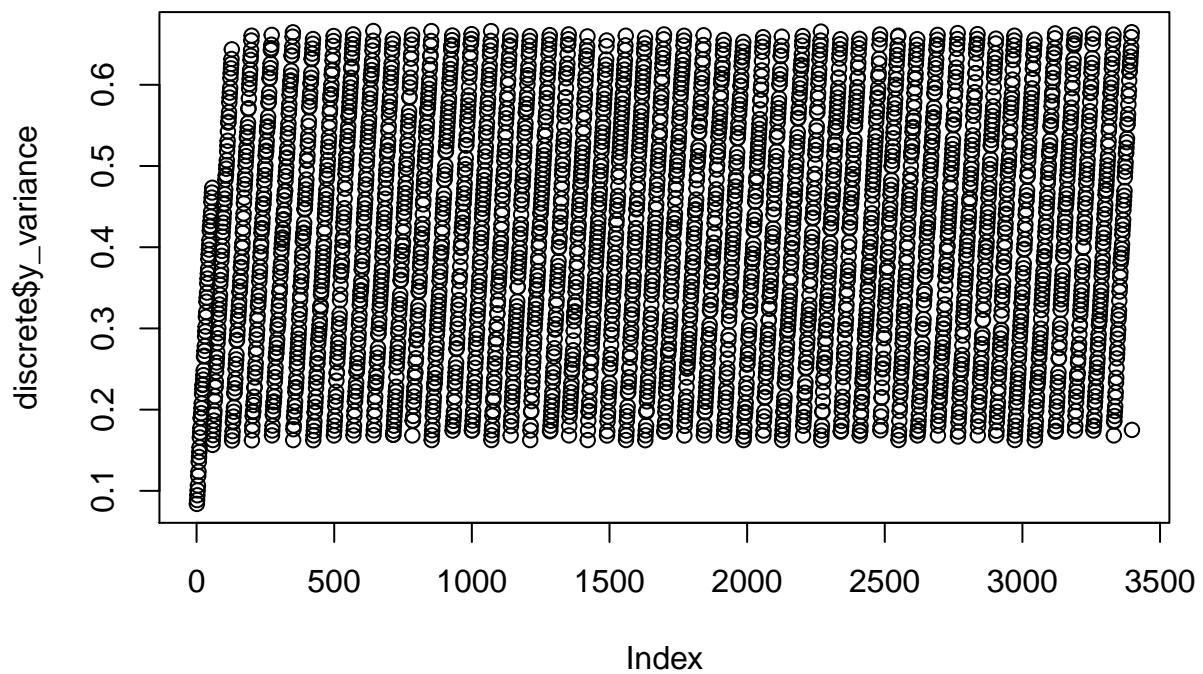
Continuous Filter Yaw Variance Over Time



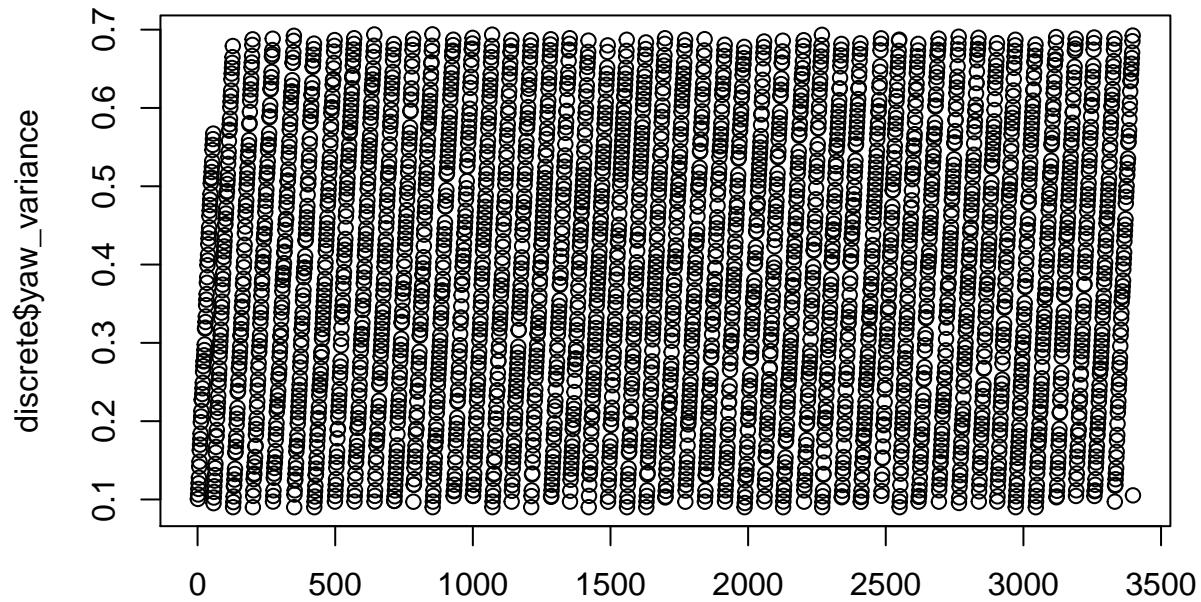
Discrete Filter X Variance Over Time



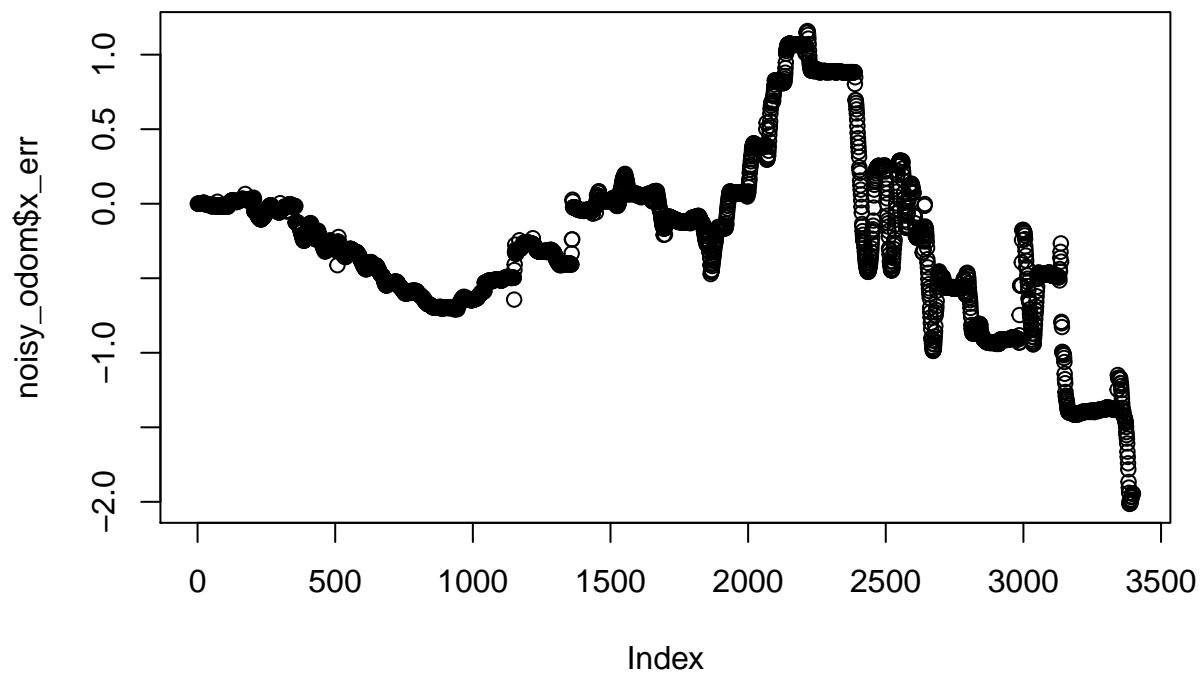
Discrete Filter Y Variance Over Time



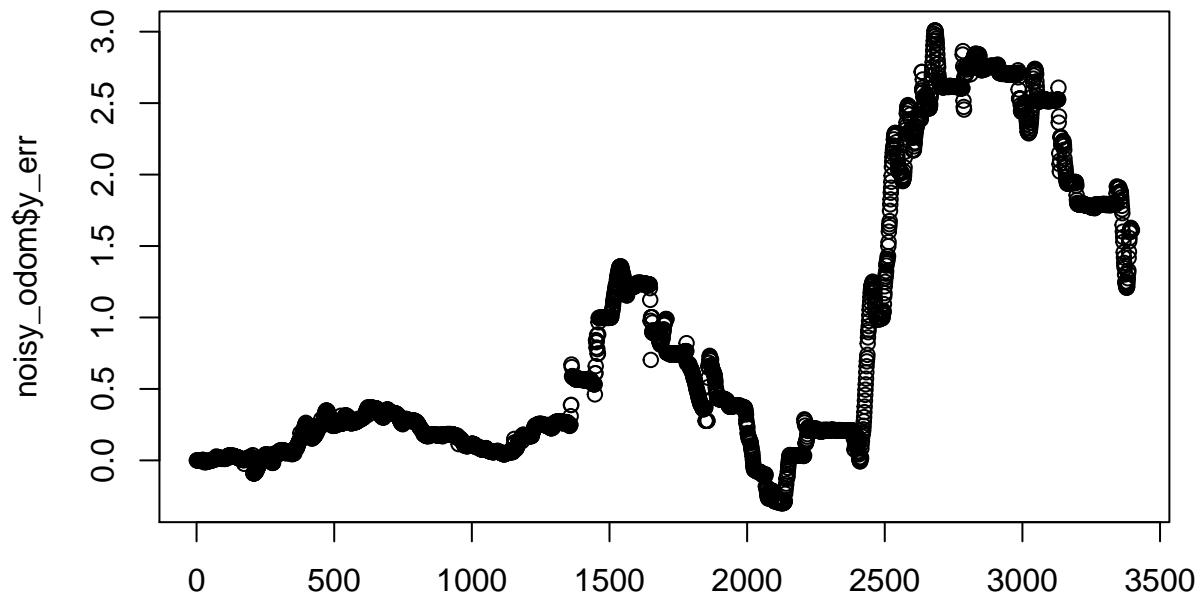
Discrete Filter Yaw Variance Over Time



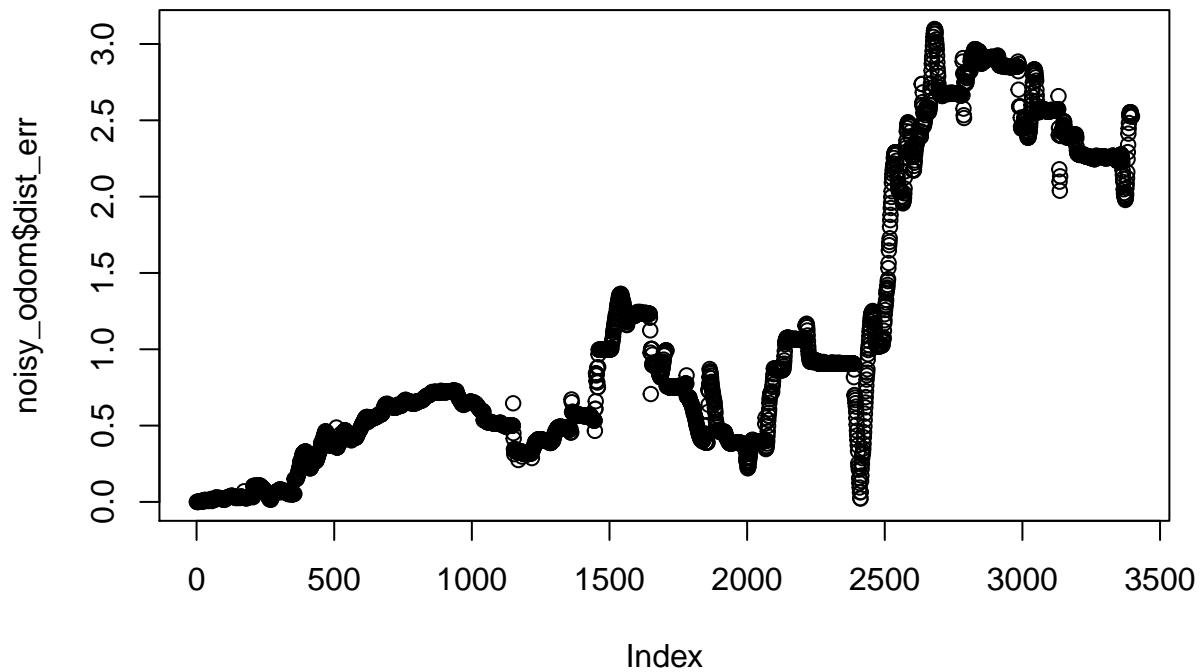
Noisy Odom X Error Over Time^{Index}



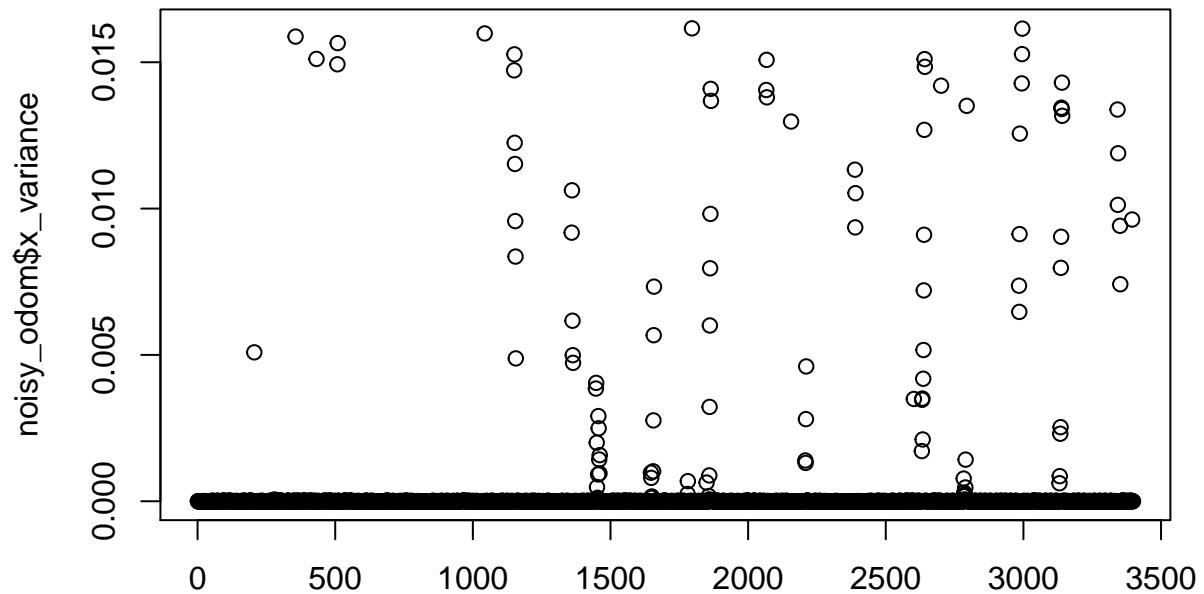
Noisy Odom Y Error Over Time



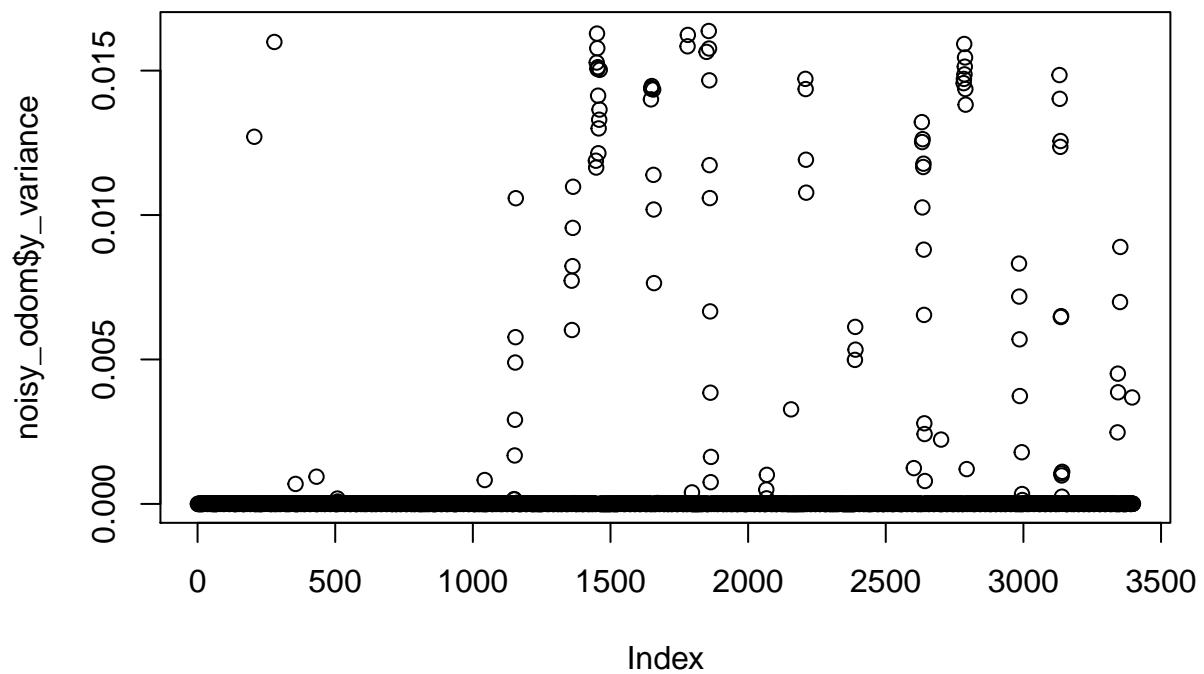
Noisy Odom Horizontal Distance Error Over Time



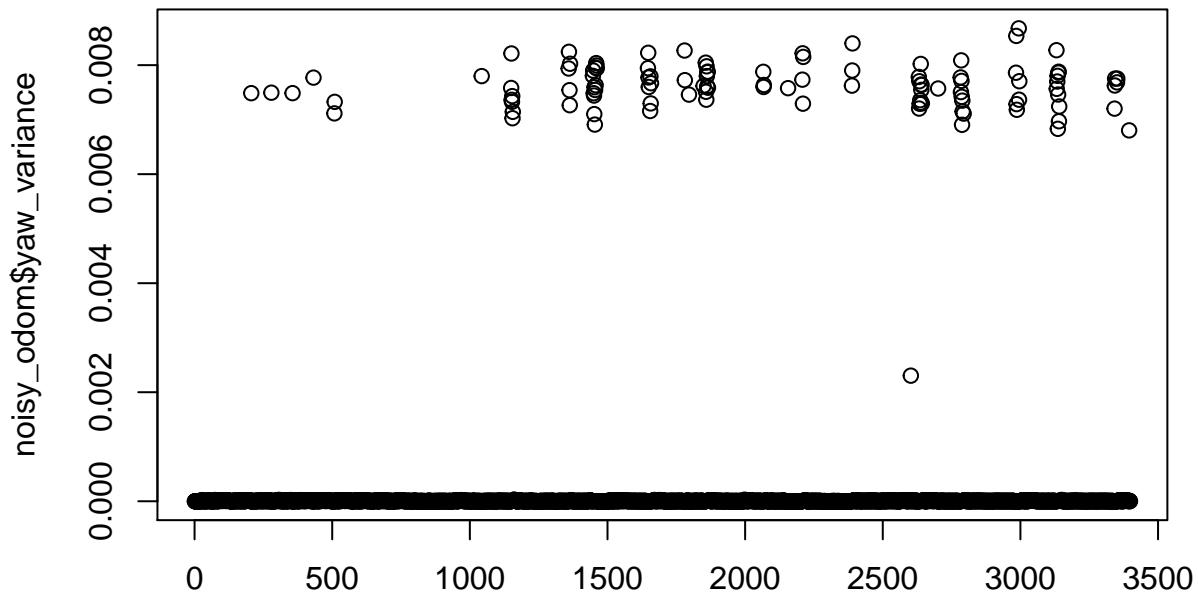
Variance of X Coordinate in Noisy Odometry



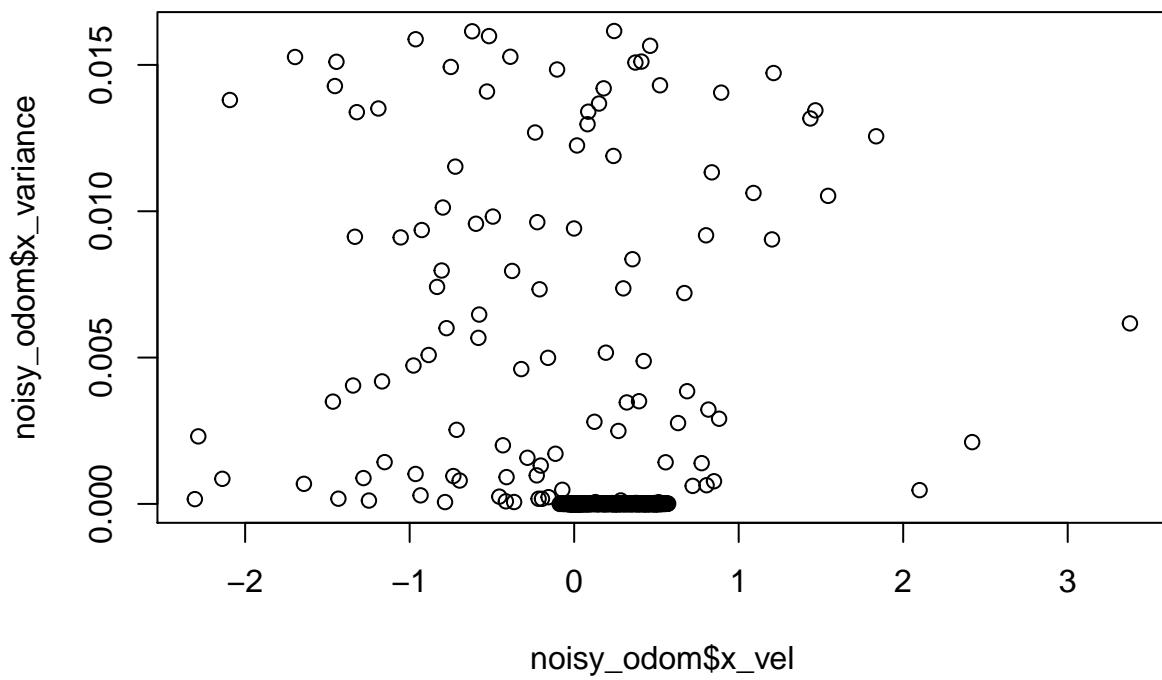
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

