

two_mobile_no_gps Turtlebot 2 Report

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This is a summary of the data from the two_mobile_no_gps experiment, Turtlebot #2.

The runtime of this experiment was 0 hours, 6 minutes, and 42 seconds.

The total number of external pose measurements received by the robot during this time was 832 which means poses were received at an average of 2.0696517 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. 
## -171.80000 -122.80000 -78.57000 -78.13000 -31.50000 0.00004
```

```
summary(continuous$y_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -88.36  -63.11  -40.34  -40.12  -16.11    0.00
```

```
summary(continuous$yaw_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -3.141000 -1.560000 -0.006193  0.012160  1.600000  3.141000
```

```
summary(continuous$dist_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.00001  35.38000  88.32000  87.83000 138.10000 193.20000
```

```
summary(discrete$x_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -615.4000 -481.5000 -348.4000 -341.8000 -212.6000  0.2716
```

```
summary(discrete$y_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -158.20000 -118.60000 -77.82000 -78.29000 -37.11000 -0.00267
```

```
summary(discrete$yaw_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -3.1410000 -1.5450000  0.0000967  0.0252500  1.6120000  3.1410000
```

```
summary(discrete$dist_error)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## 0.0255 215.80000 356.90000 350.80000 495.90000 635.4000
```

```
summary(noisy_odom$x_err)
```

```
##      Min.   1st Qu.   Median   Mean   3rd Qu.   Max. 
## -11.06000 -8.74000 -4.01600 -4.45700 -0.01343  2.08900
```

```

summary(noisy_odom$y_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## -4.1290 -1.9430 -0.5635 -0.6517  0.4514  2.7560

summary(noisy_odom$dist_err)

##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000019 1.944000 4.140000 5.129000 9.004000 11.120000

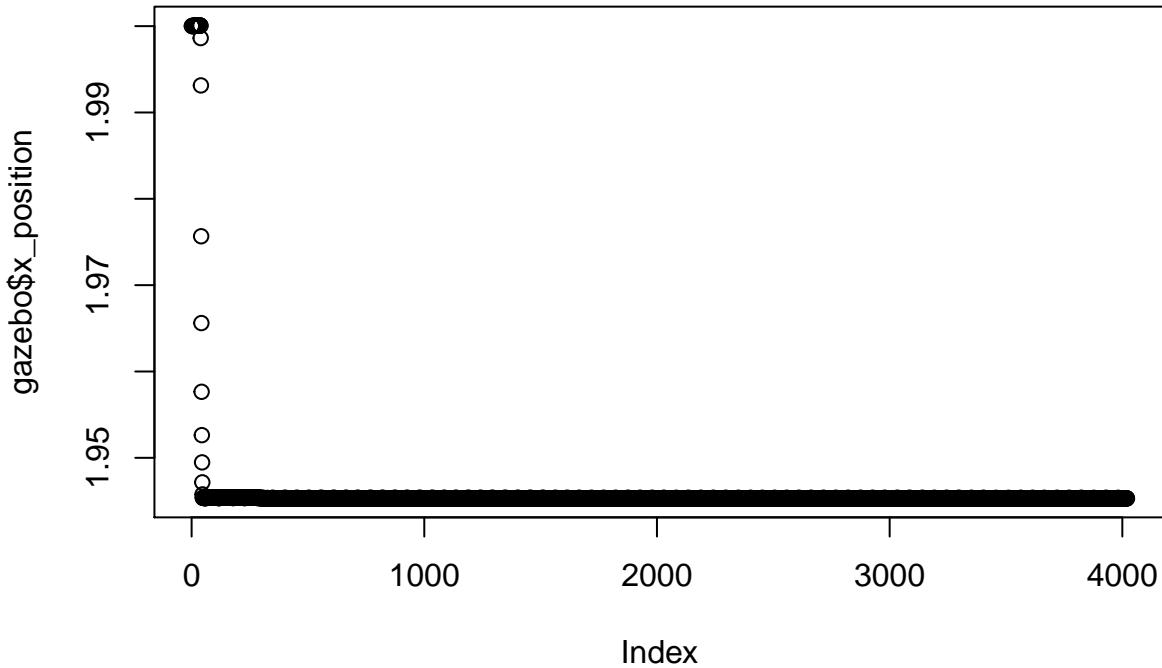
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

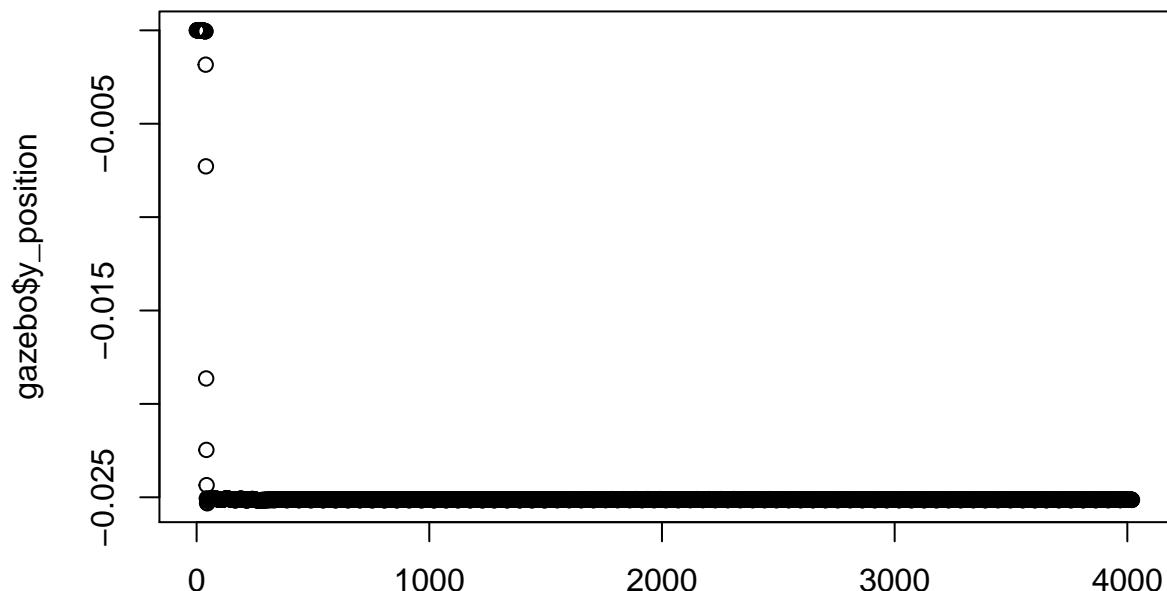
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.000000 0.007294 0.007553 0.006971 0.007798 0.008827

```

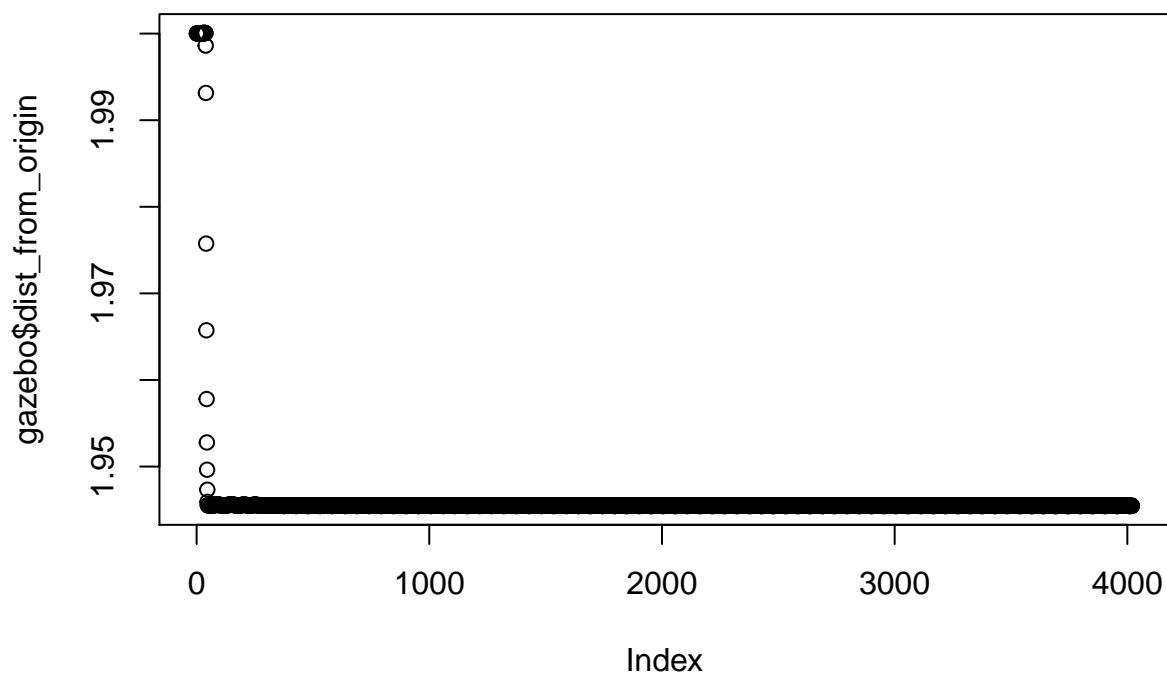
X coordinate of robot over time



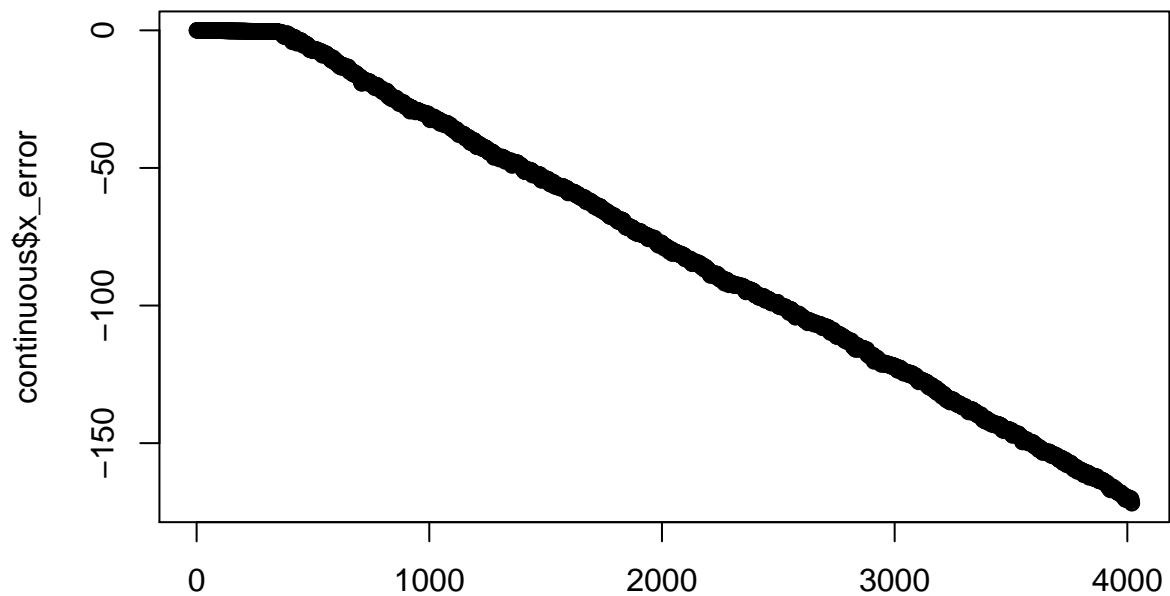
Y coordinate of robot over time



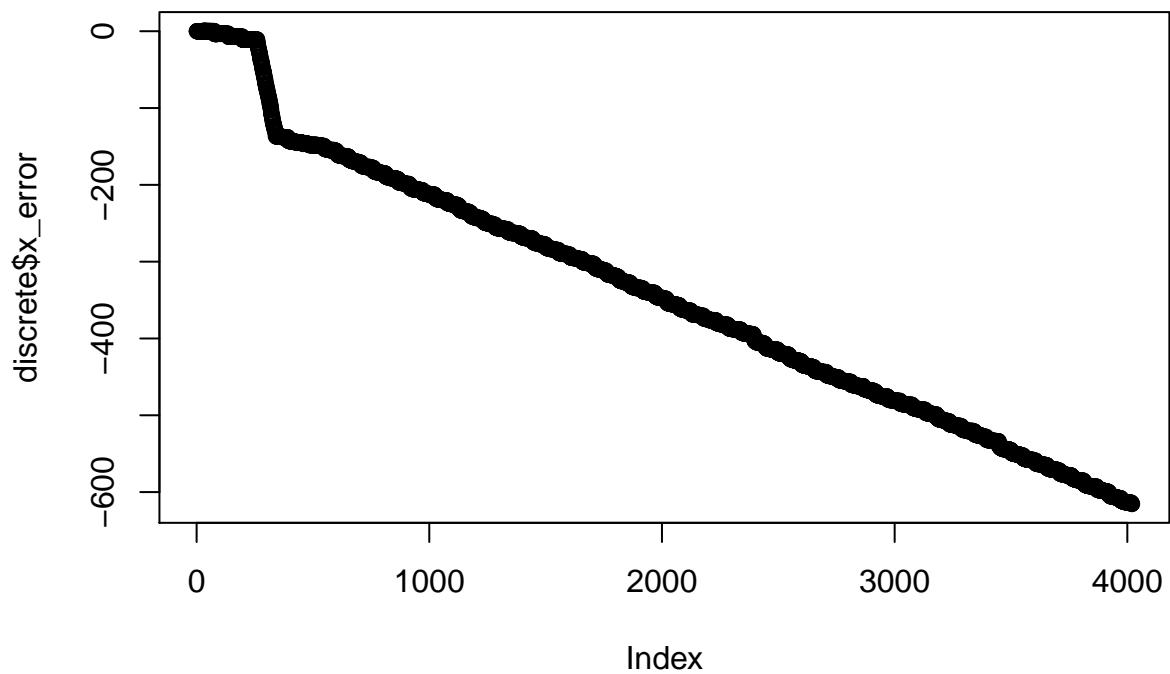
Distance from origin vs. time



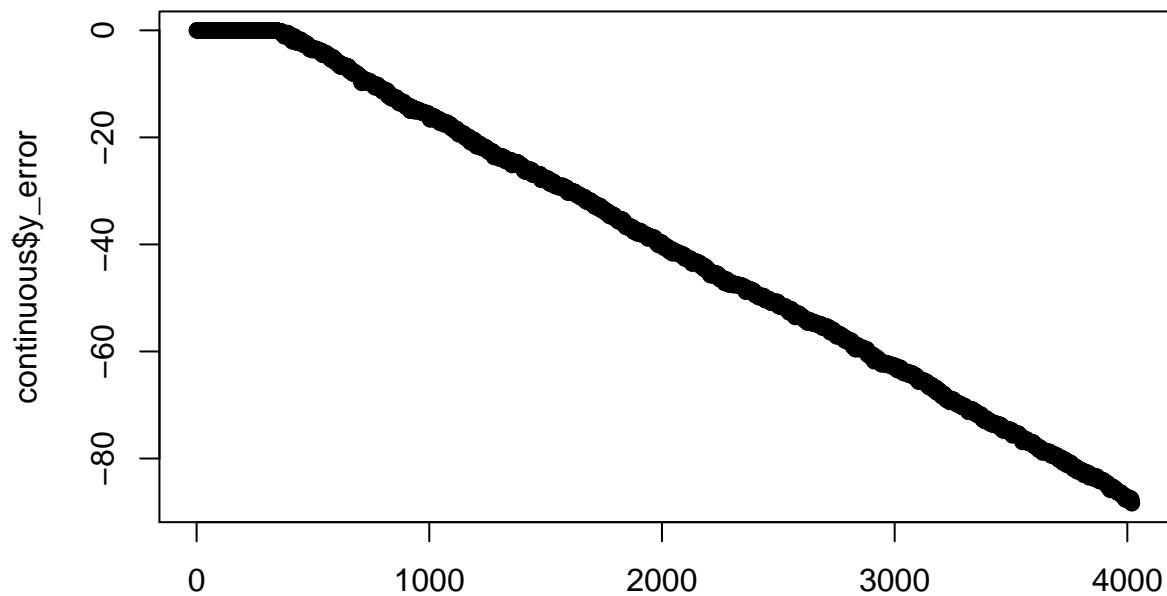
Continuous x_error over time



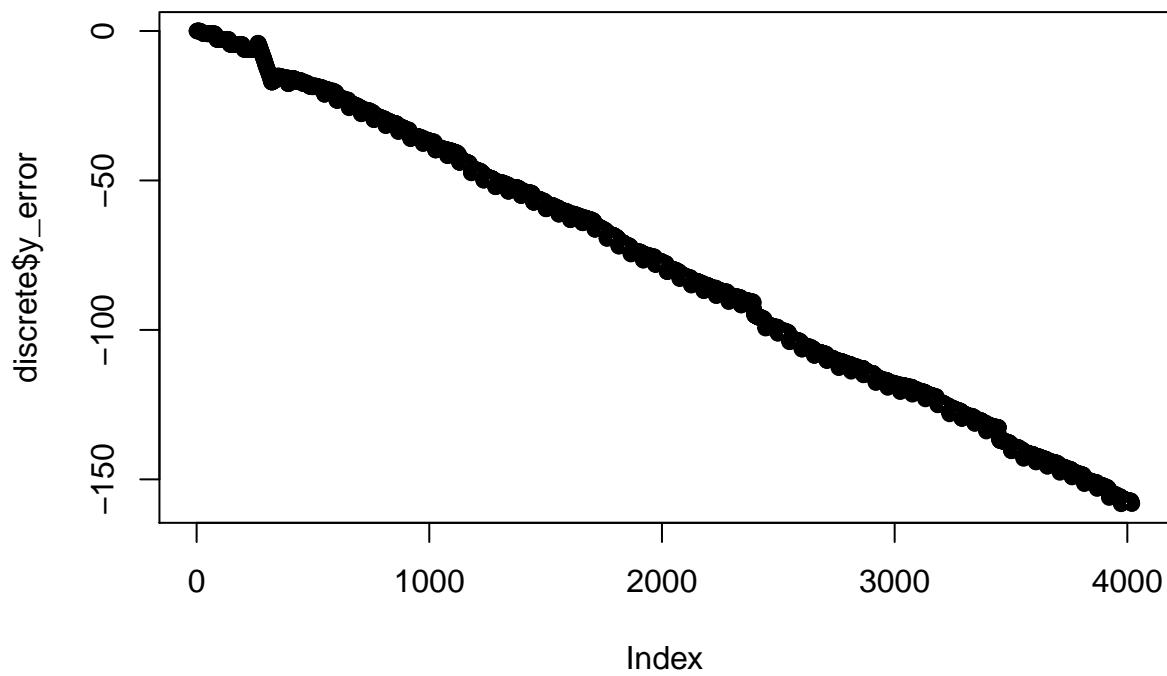
Discrete x_error over time



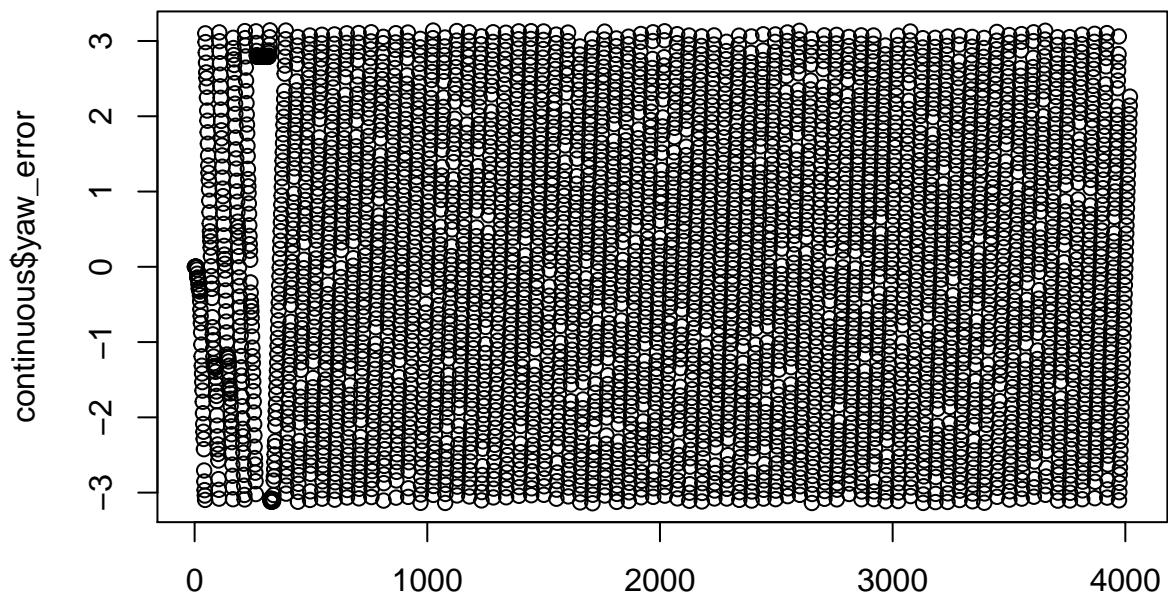
Continuous y_error over time



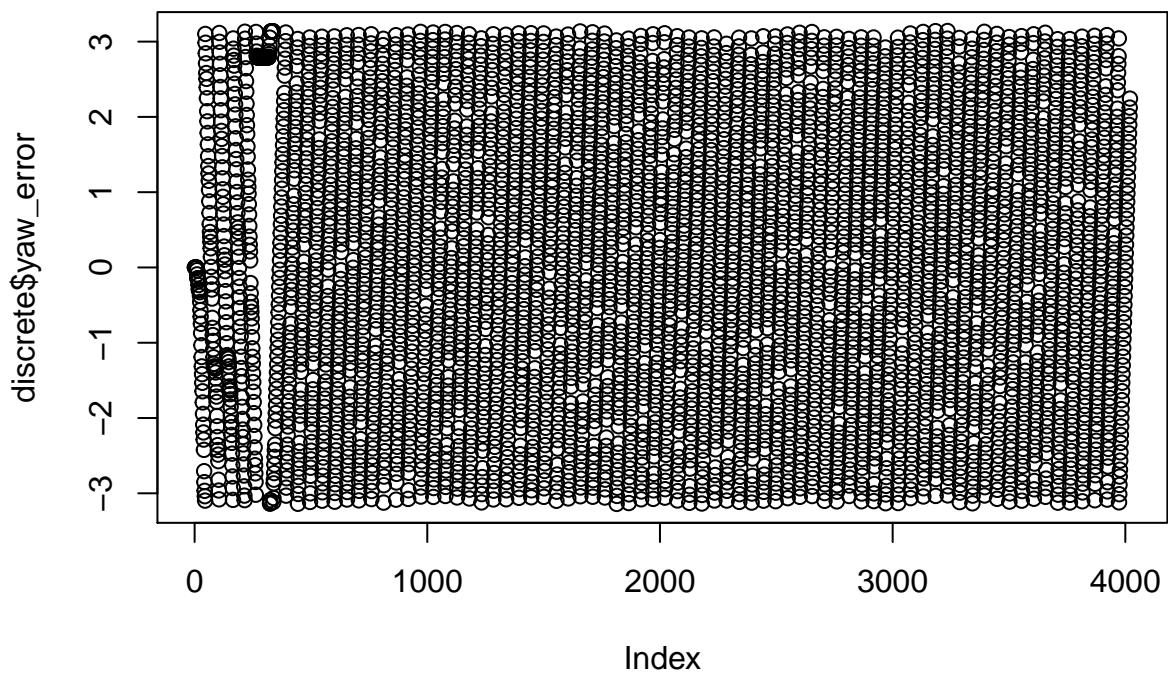
Discrete y_error over time



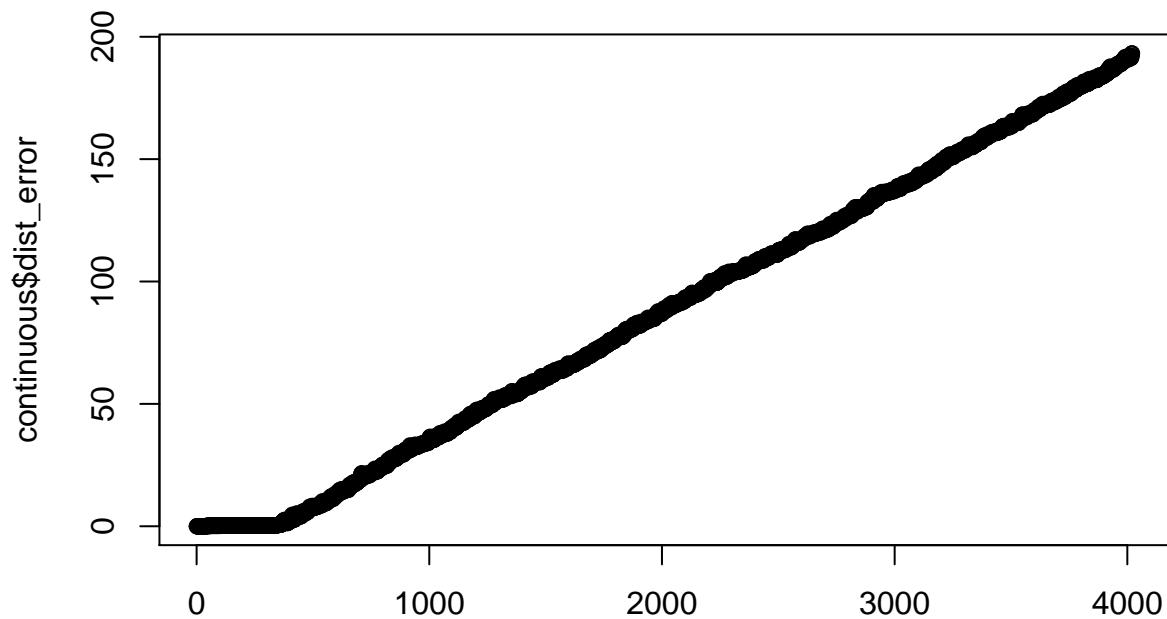
Continuous yaw error over time



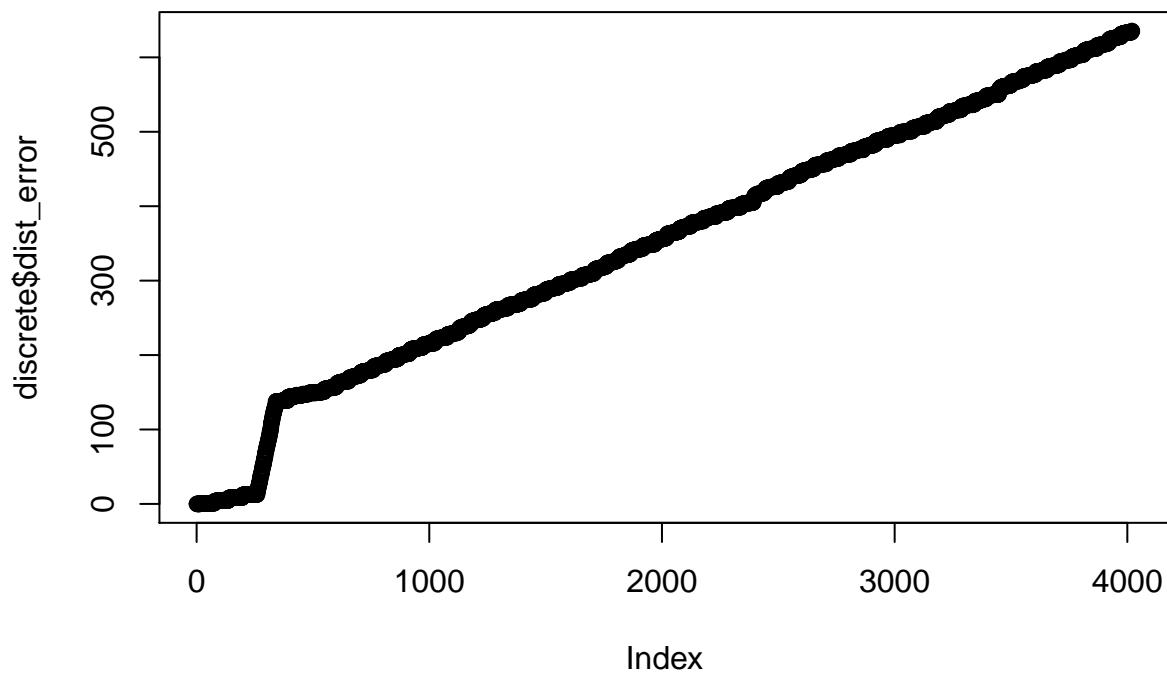
Discrete yaw error over time



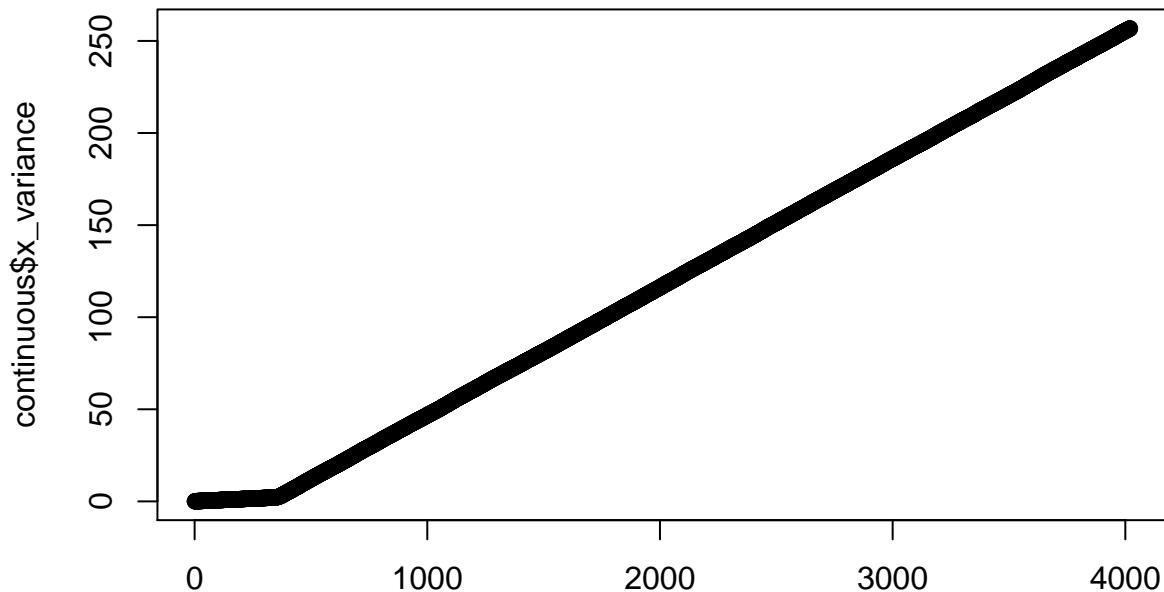
Continuous total distance error over time



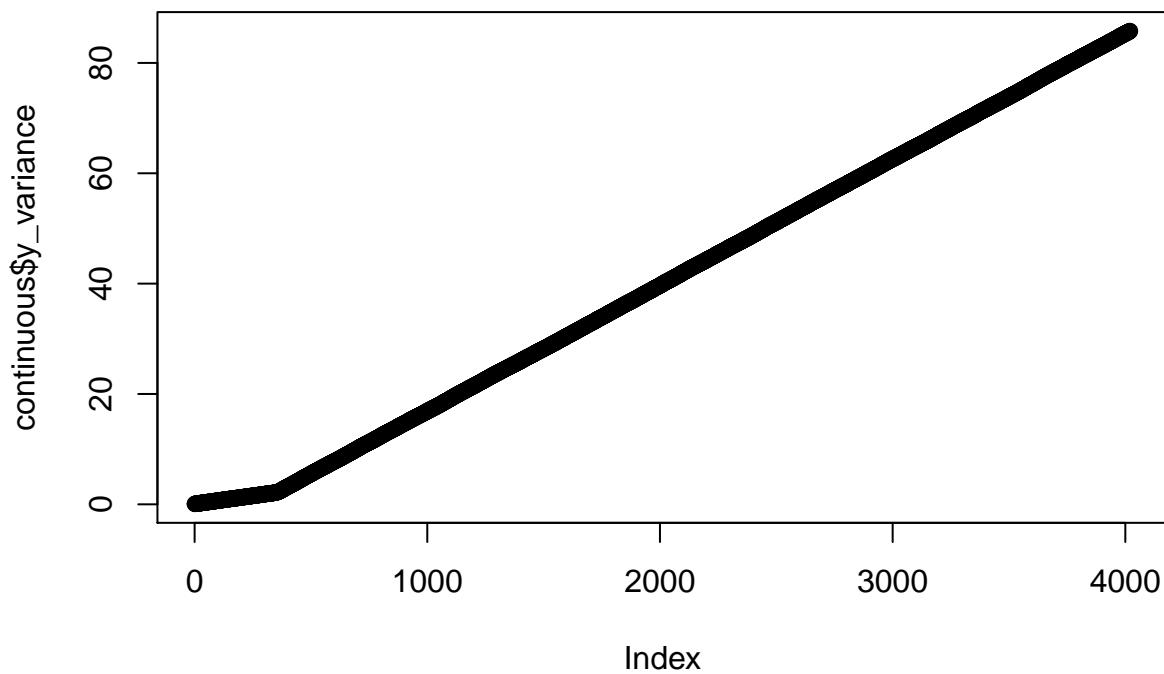
Discrete total distance error over time



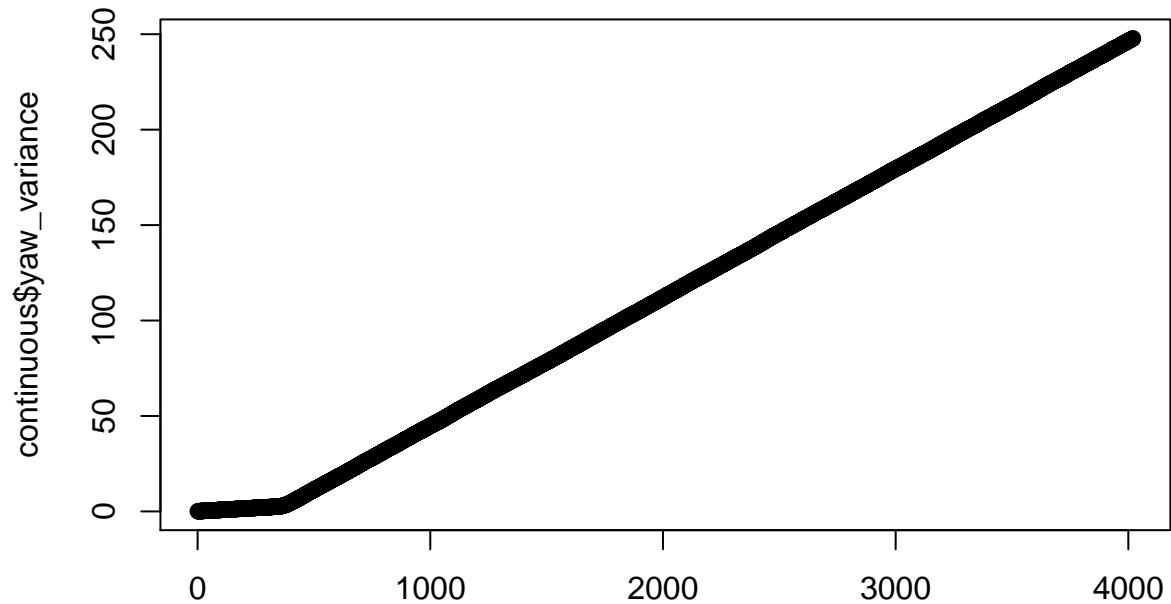
Continuous Filter X Variance Over Time



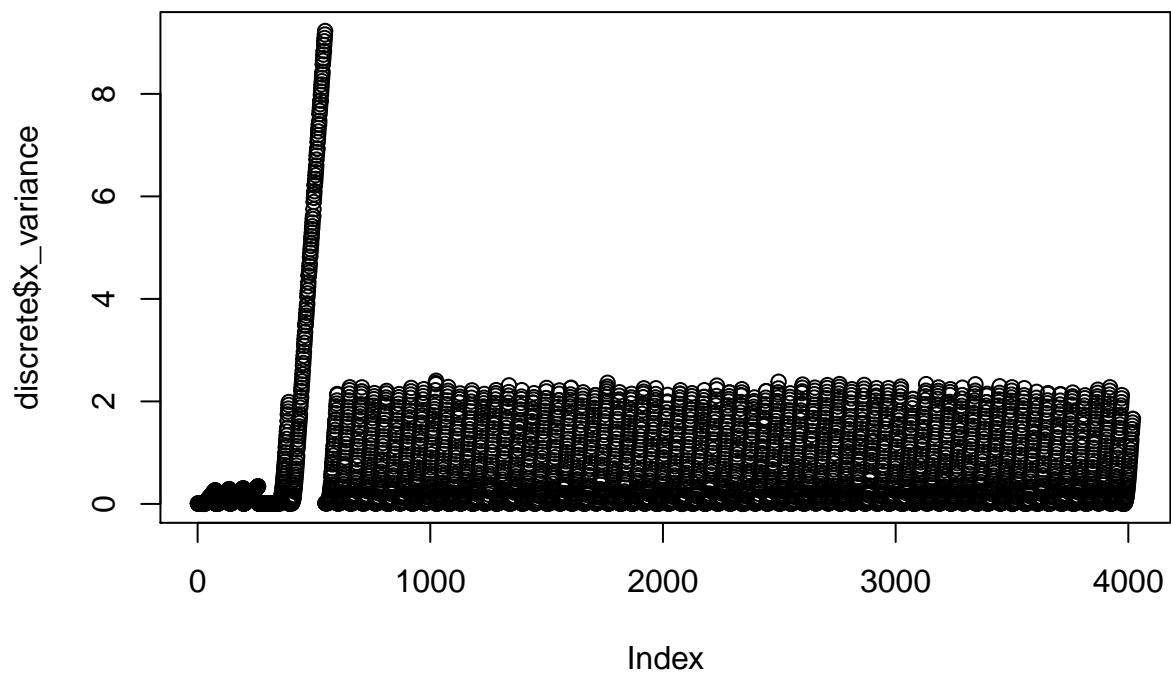
Continuous Filter Y Variance Over Time



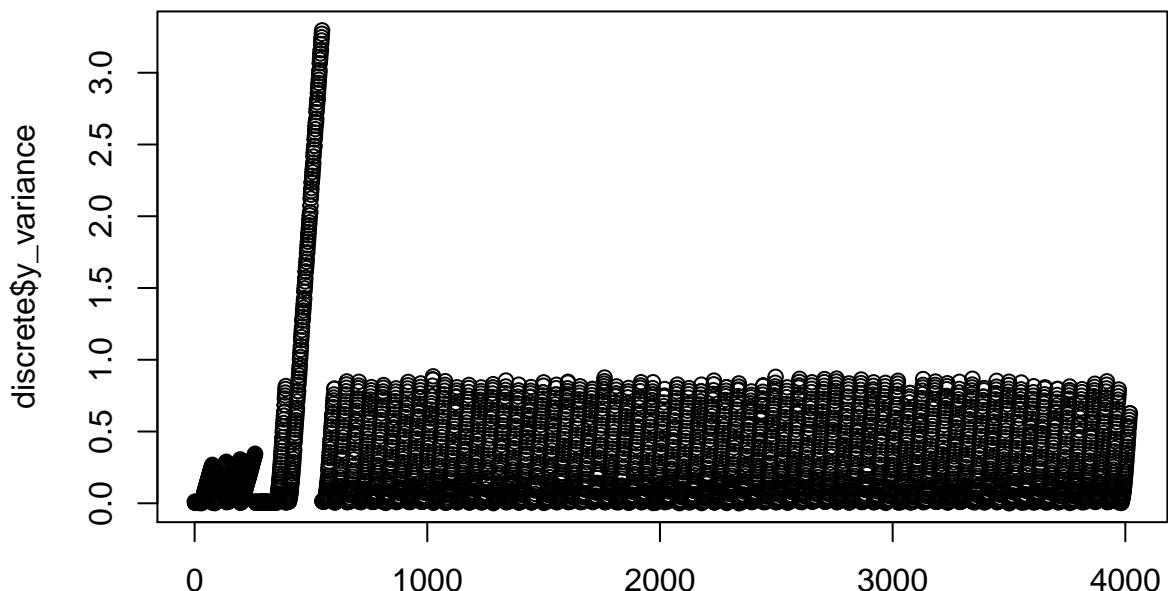
Continuous Filter Yaw Variance Over Time



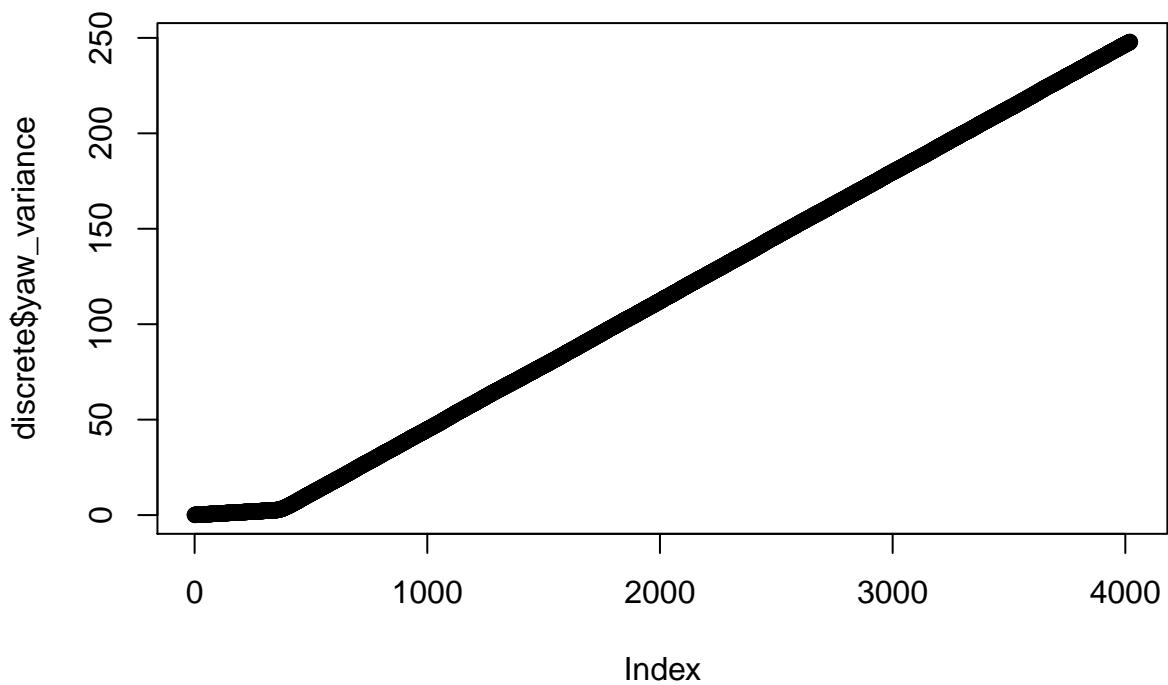
Discrete Filter X Variance Over Time



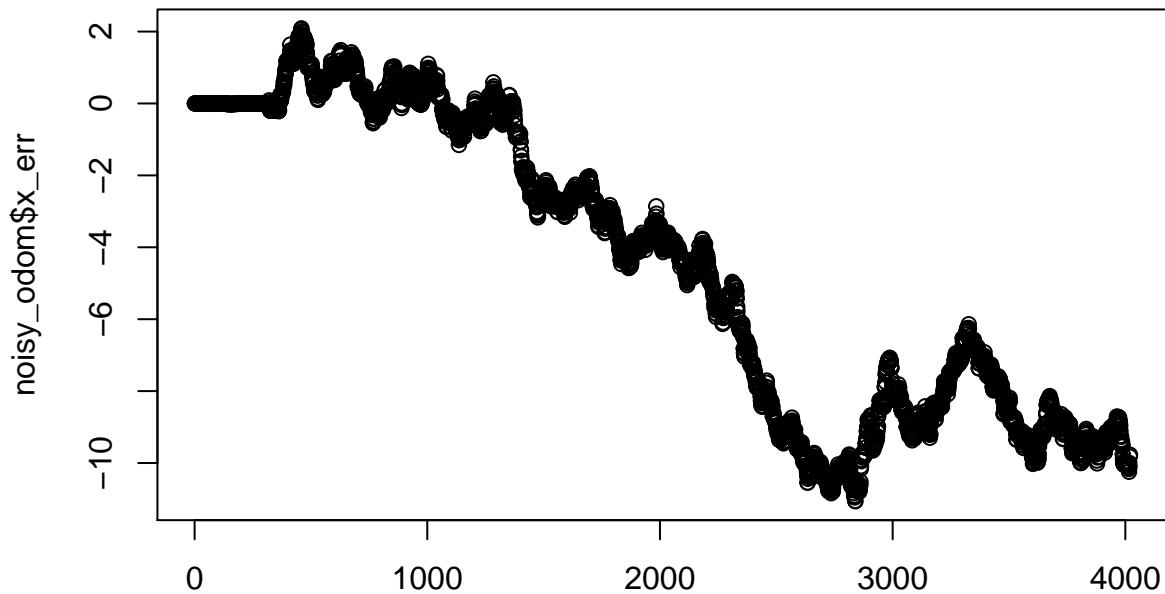
Discrete Filter Y Variance Over Time



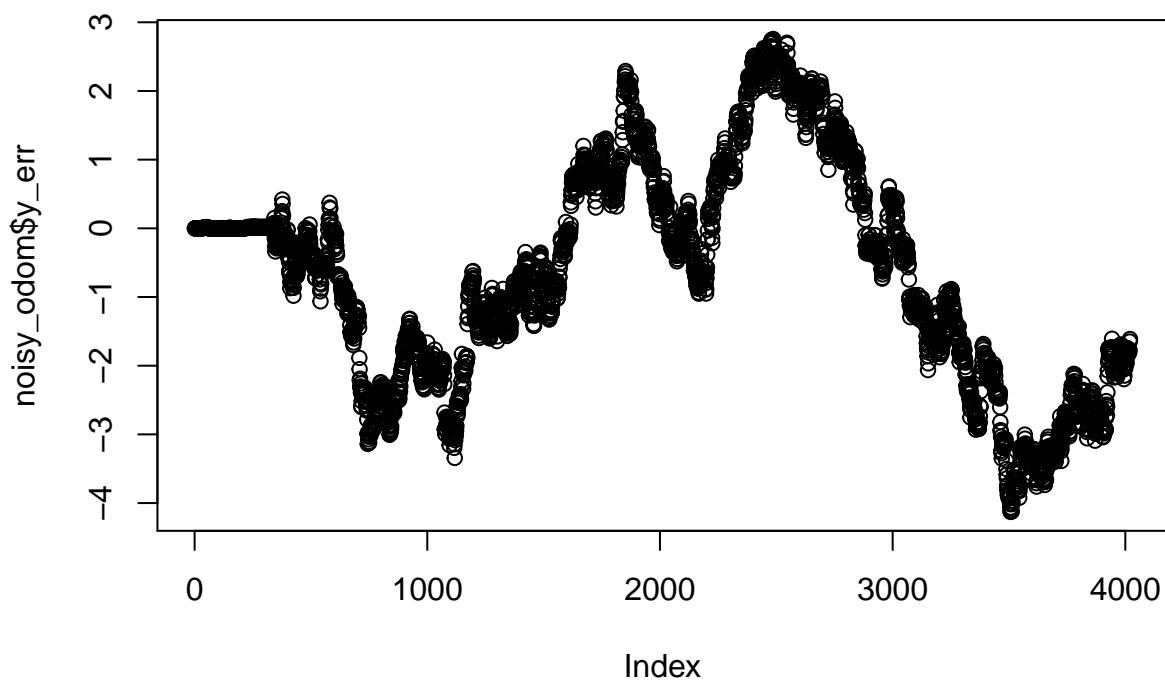
Discrete Filter Yaw Variance Over Time



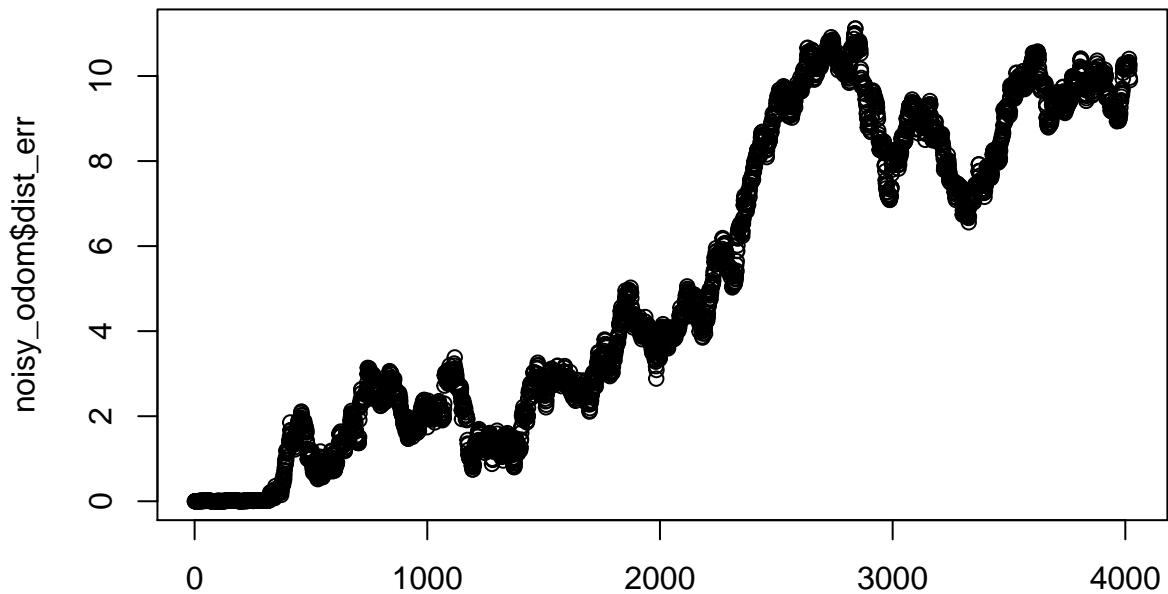
Noisy Odom X Error Over Time



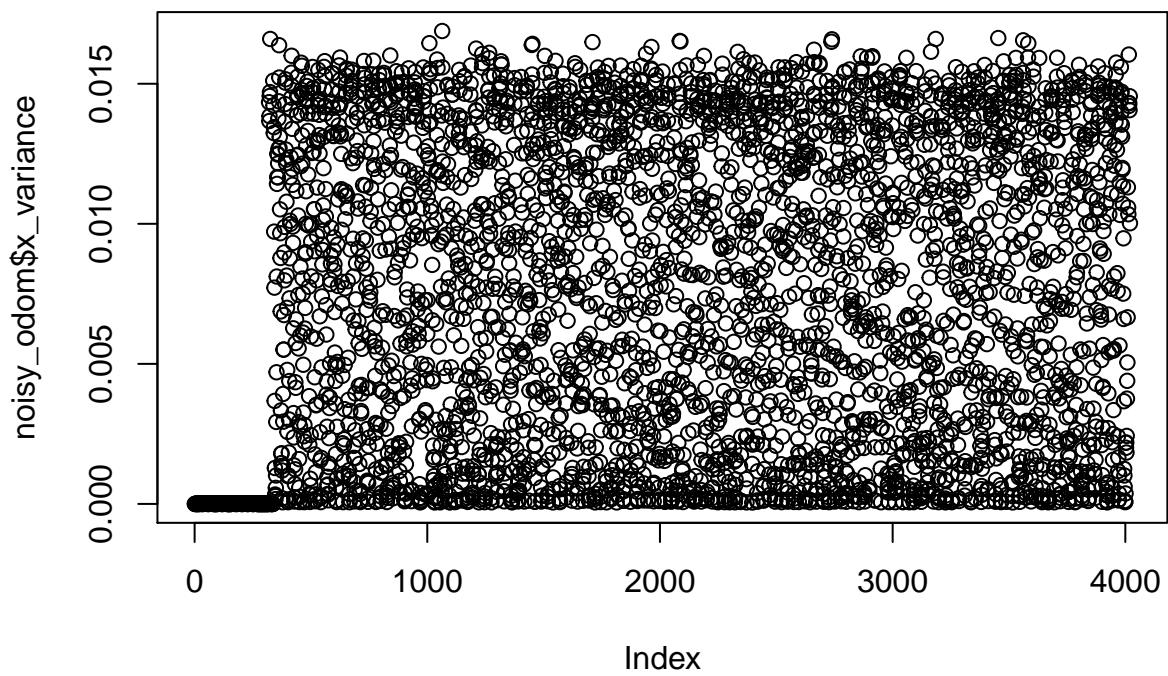
Noisy Odom Y Error Over Time



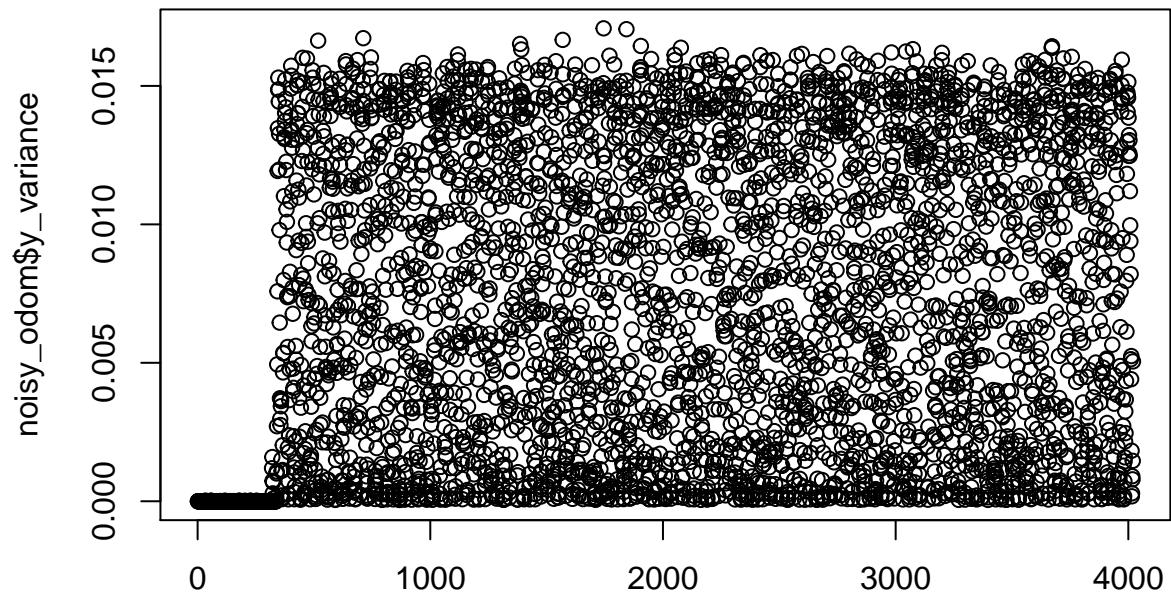
Noisy Odom Horizontal Distance Error Over Time



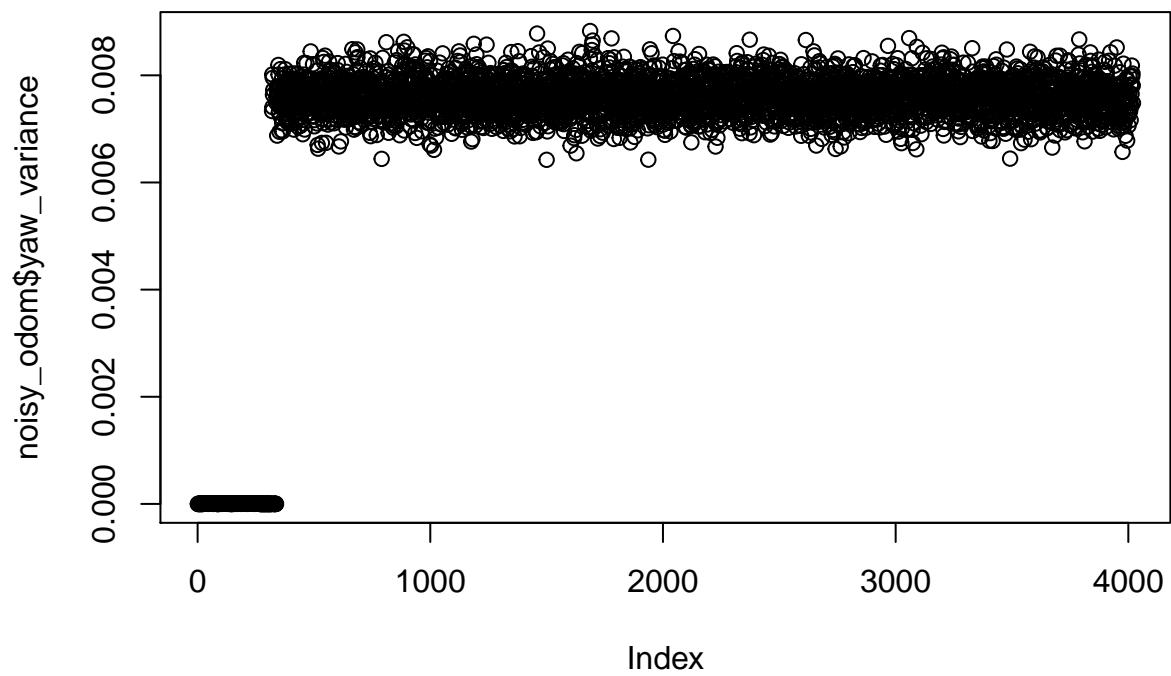
Variance of X Coordinate in Noisy Odometry
Index



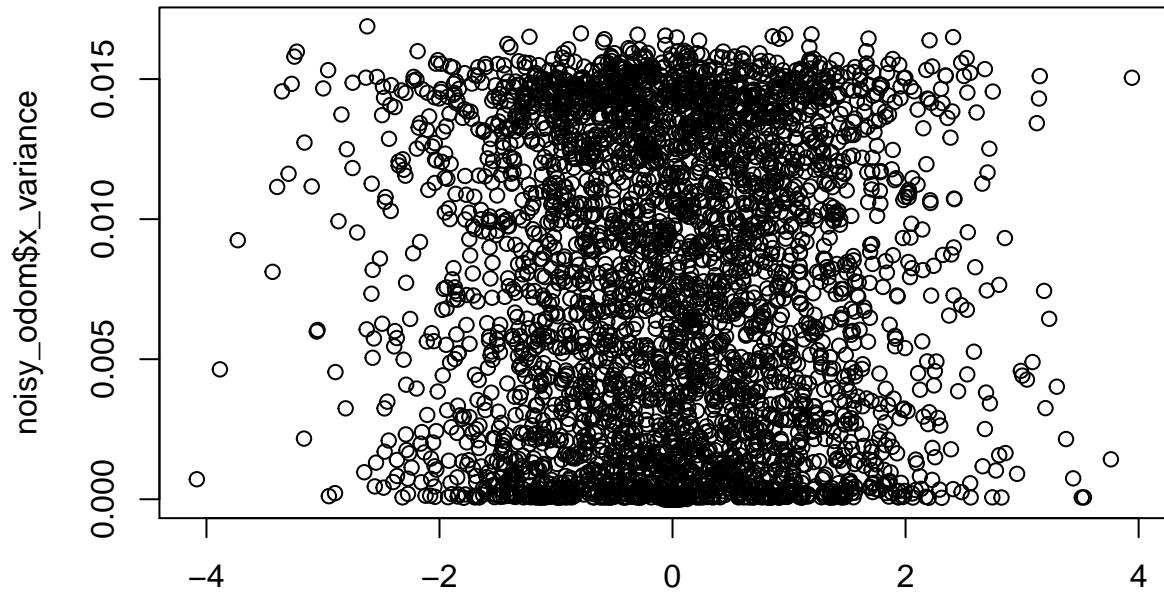
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

