

one_mobile_no_gps Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 25 minutes, and 11.8 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.  
## -4.385  2.316 113.800 138.500 253.300 388.000
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -358.600 -232.400 -101.700 -126.200 -1.378  4.359
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -3.1400000 -1.5490000  0.0005932  0.0078680  1.5720000 3.1420000
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
##    0.000  3.609 152.600 188.400 343.800 528.300
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -4.230  2.456 100.500 122.100 223.100 341.500
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -403.300 -261.700 -115.100 -142.300 -1.394  3.709
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -3.1420000 -1.5530000  0.0000936  0.0070620  1.5780000 3.1410000
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
##    0.000  3.325 152.700 188.500 343.900 528.400
```

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

```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.  
## -22.7100 -16.8900 -11.5000 -9.8160 -0.3251  0.2092
```

```

summary(noisy_odom$y_err)

##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## -19.26000 -10.92000  -6.21500  -7.20900  -3.30000  0.00333

summary(noisy_odom$dist_err)

##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## 0.0000001  3.654000 12.800000 12.530000 20.110000 26.920000

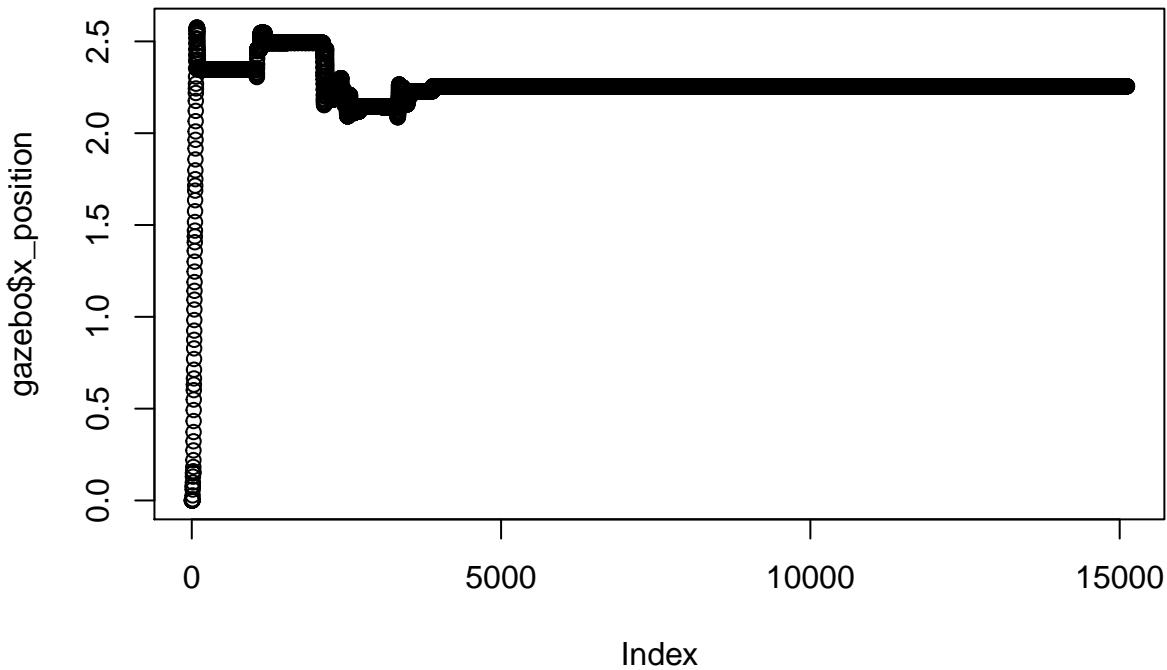
if (NROW(gps) > 0) {
  summary(gps$x_err)
  summary(gps$y_err)
  summary(gps$dist_err)
}

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

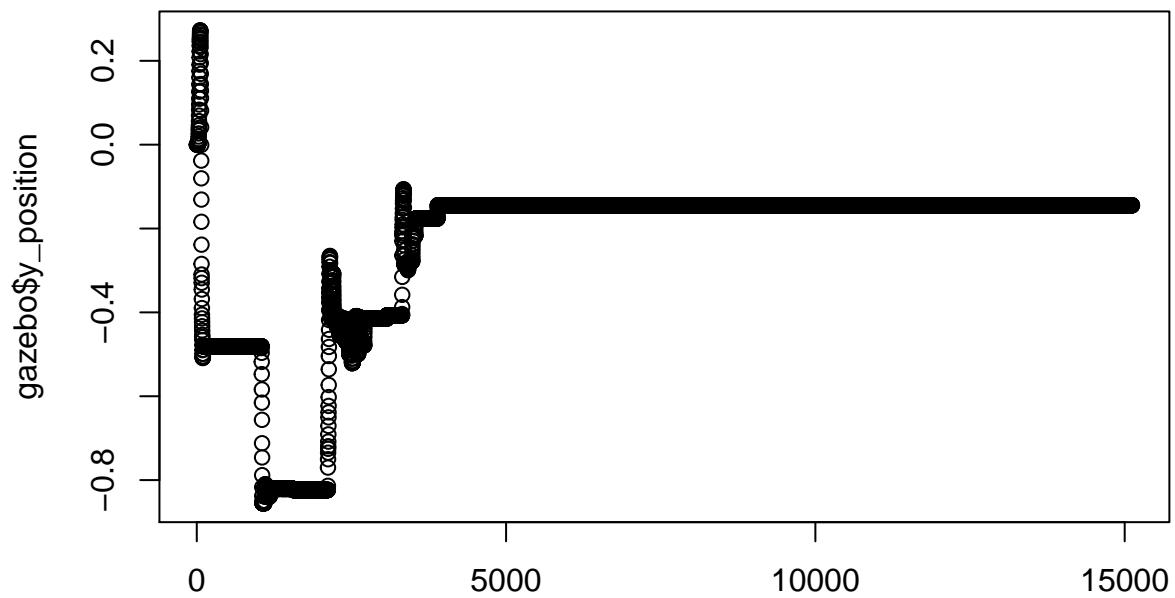
##      Min.   1st Qu.    Median     Mean   3rd Qu.   Max.
## 0.000e+00 5.376e-06 7.423e-03 5.510e-03 7.728e-03 8.830e-03

```

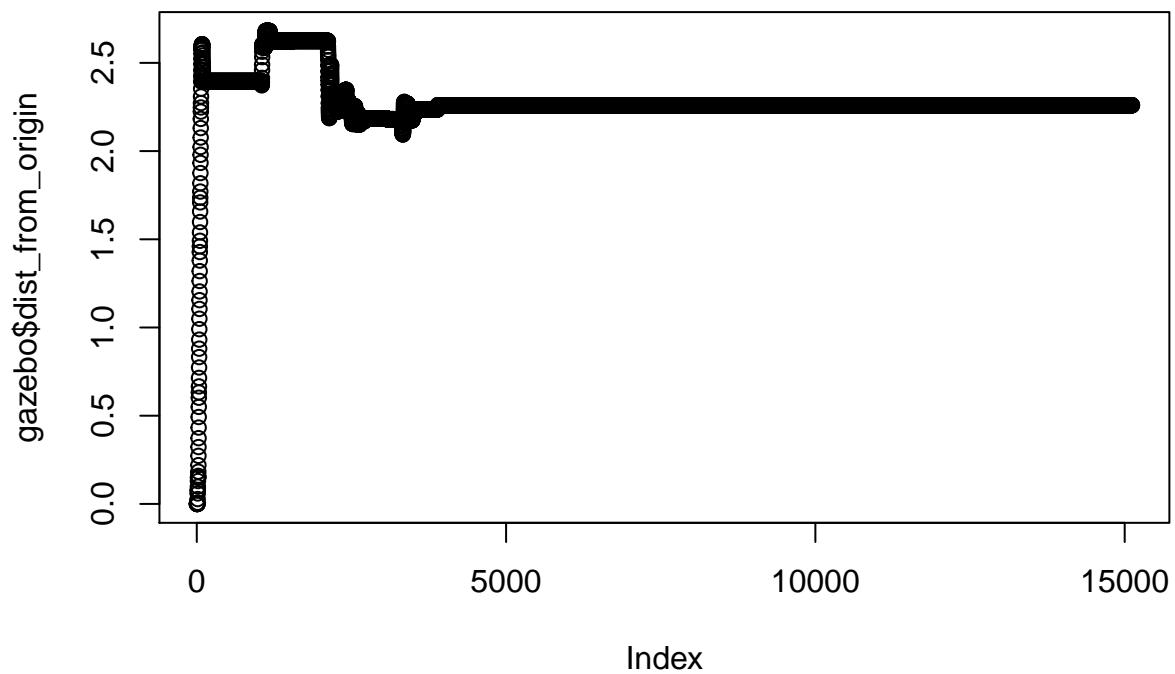
X coordinate of robot over time



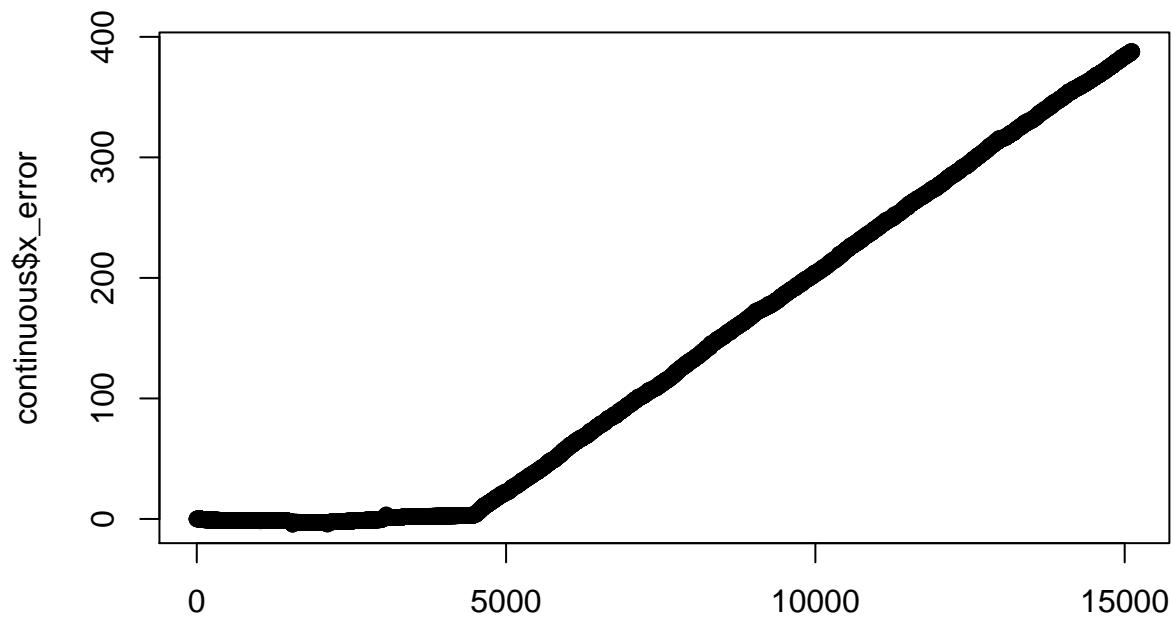
Y coordinate of robot over time



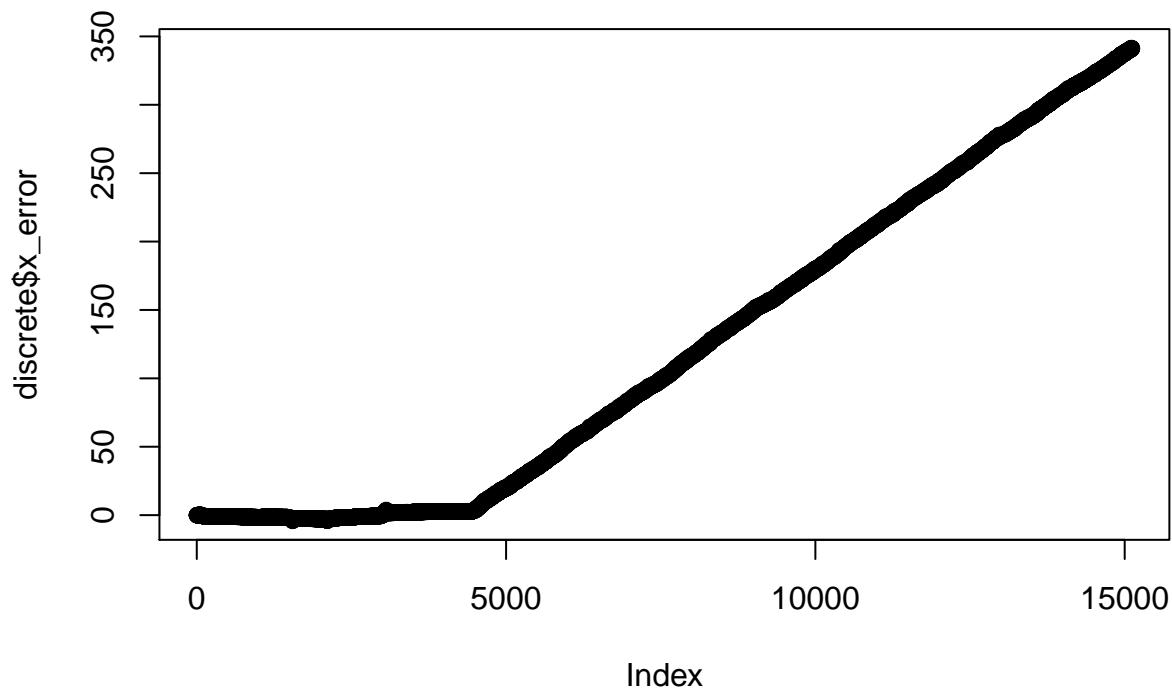
Distance from origin vs. time



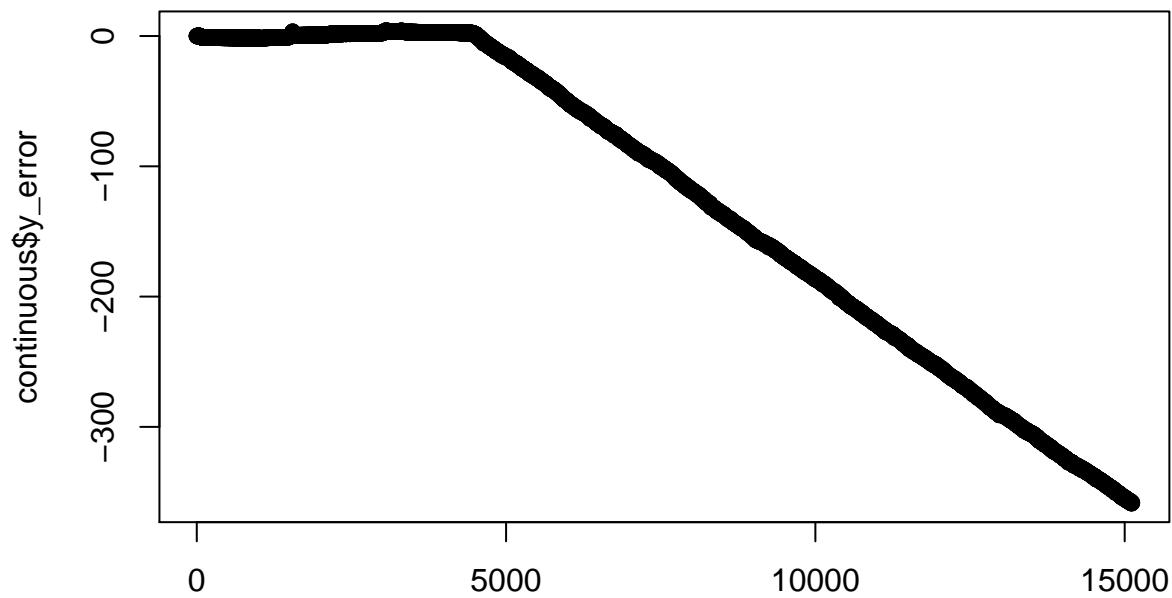
Continuous x_error over time



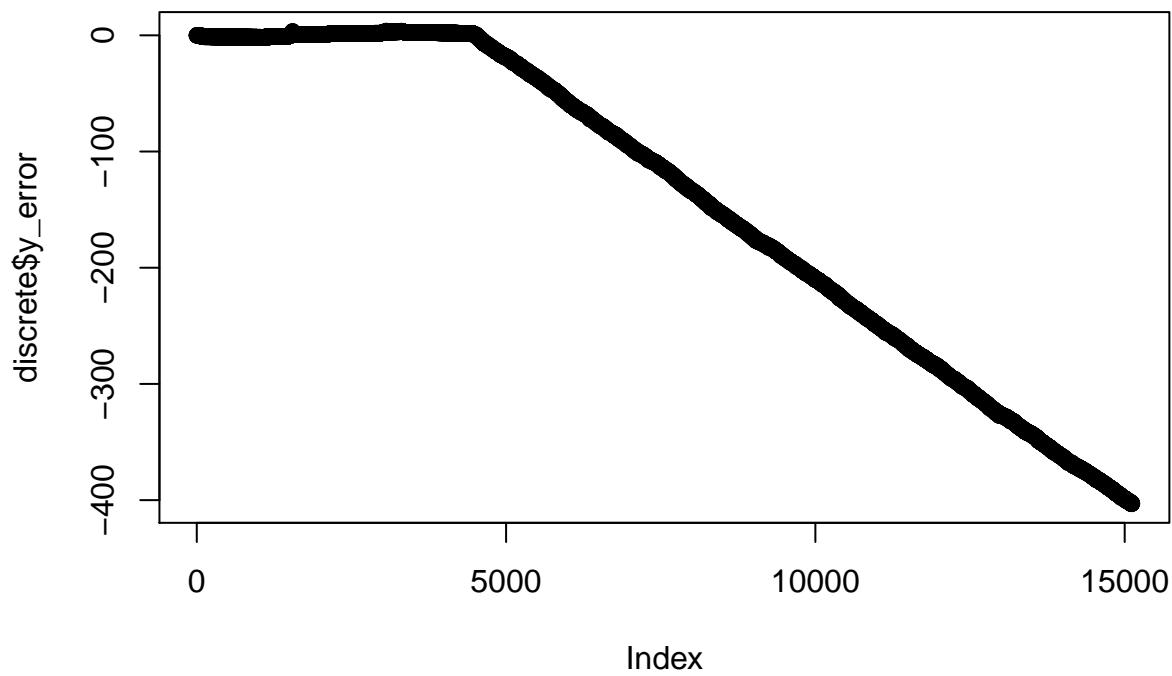
Discrete x_error over time



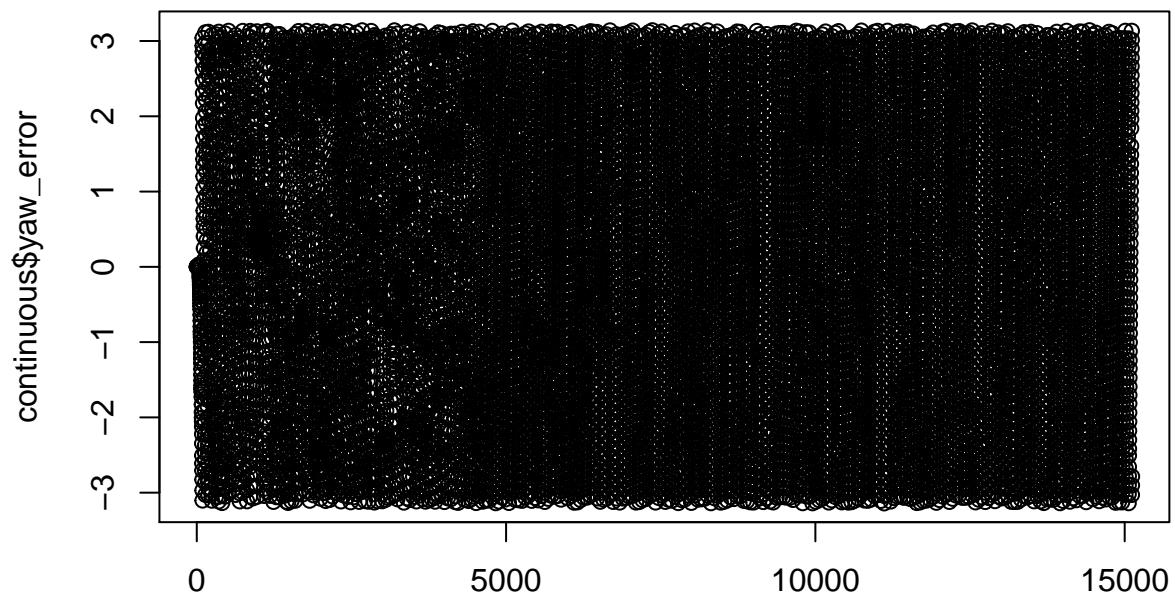
Continuous y_error over time



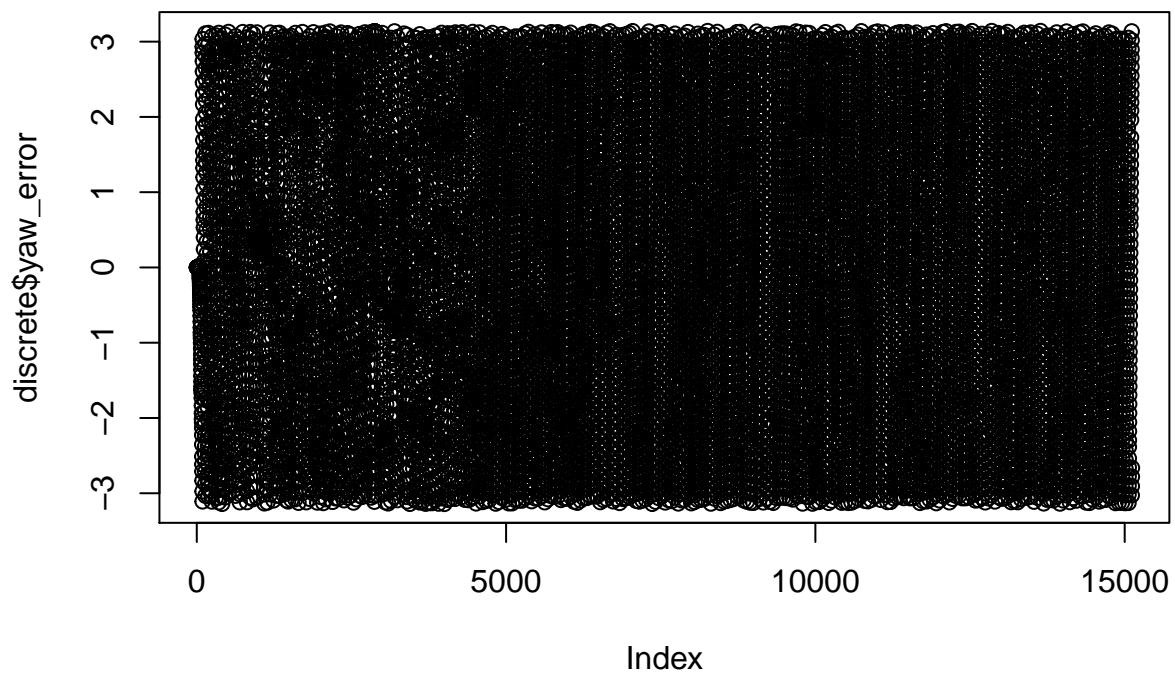
Discrete y_error over time



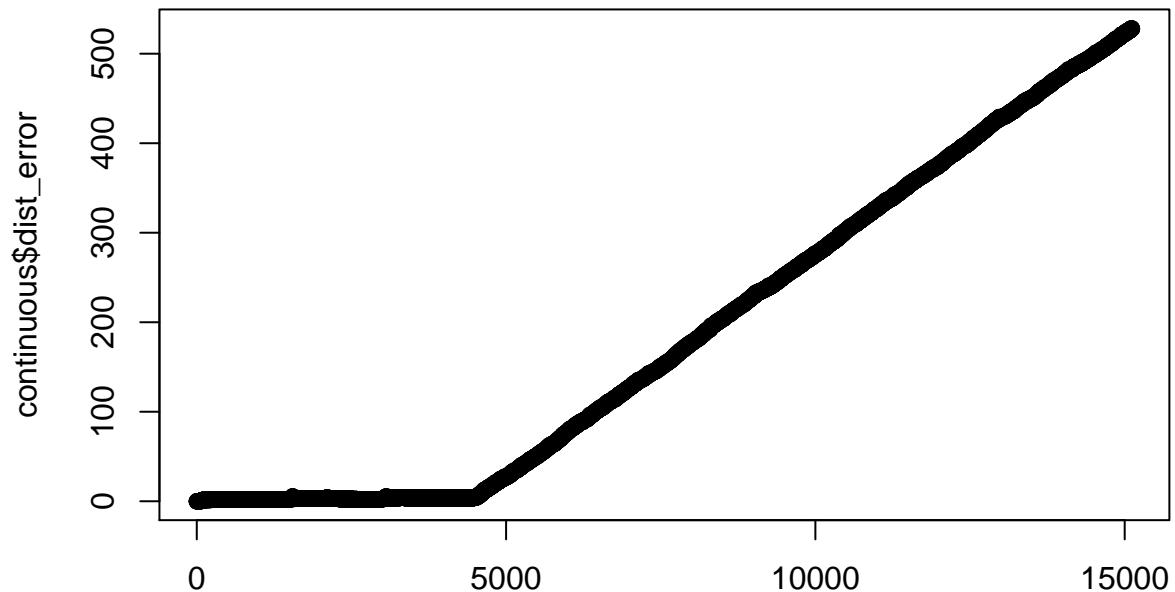
Continuous yaw error over time



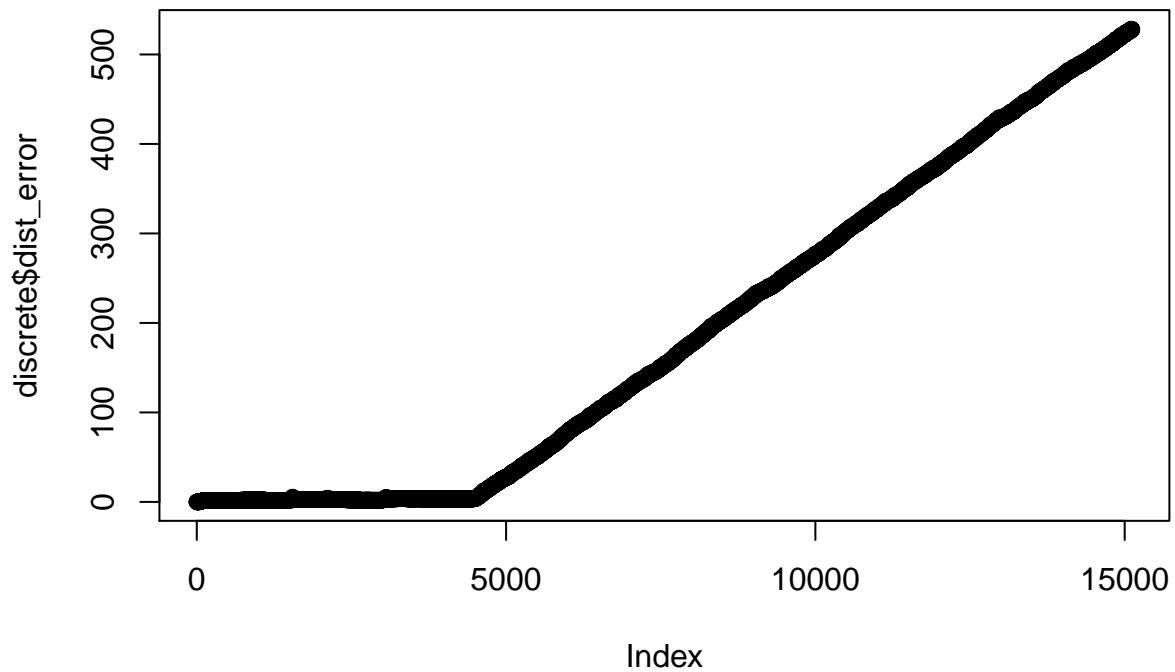
Discrete yaw error over time



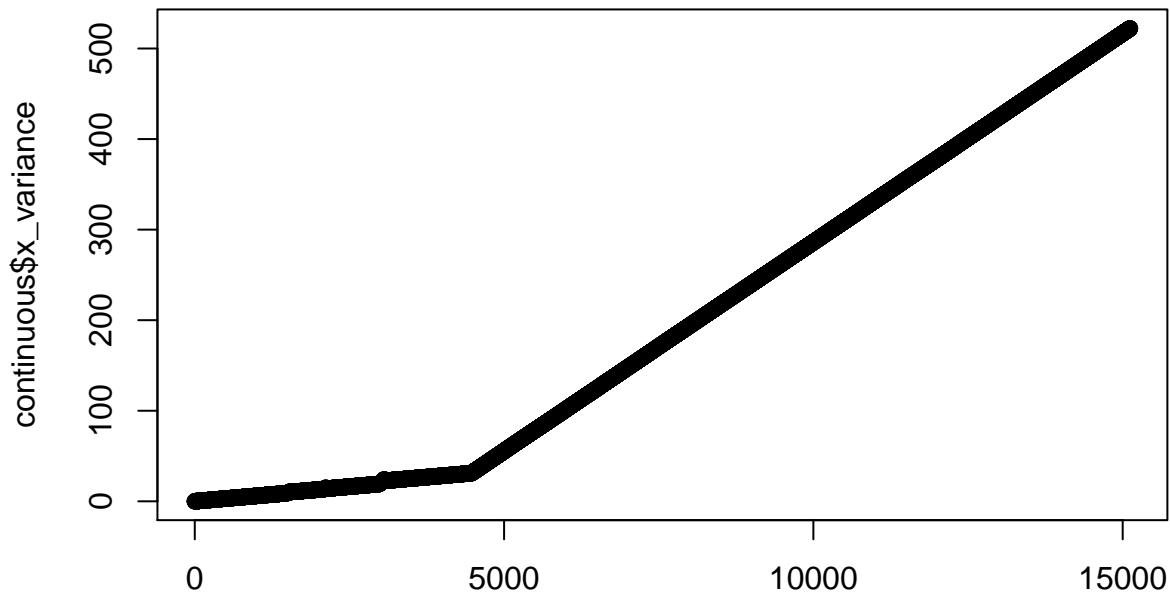
Continuous total distance error over time



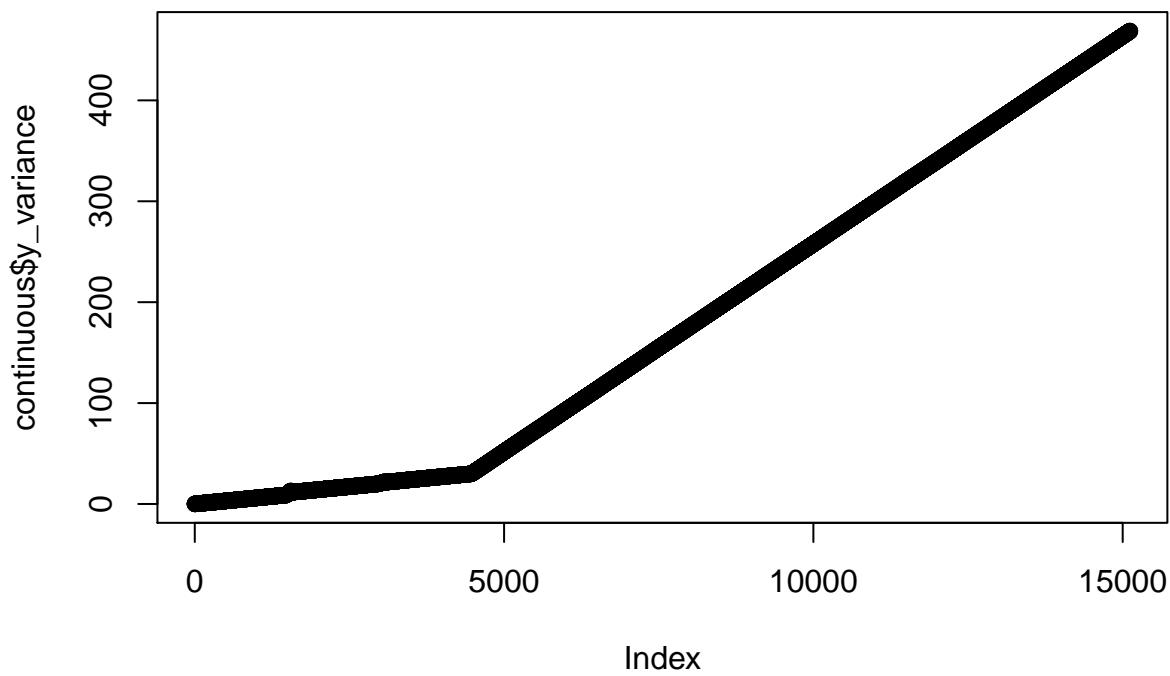
Discrete total distance error over time



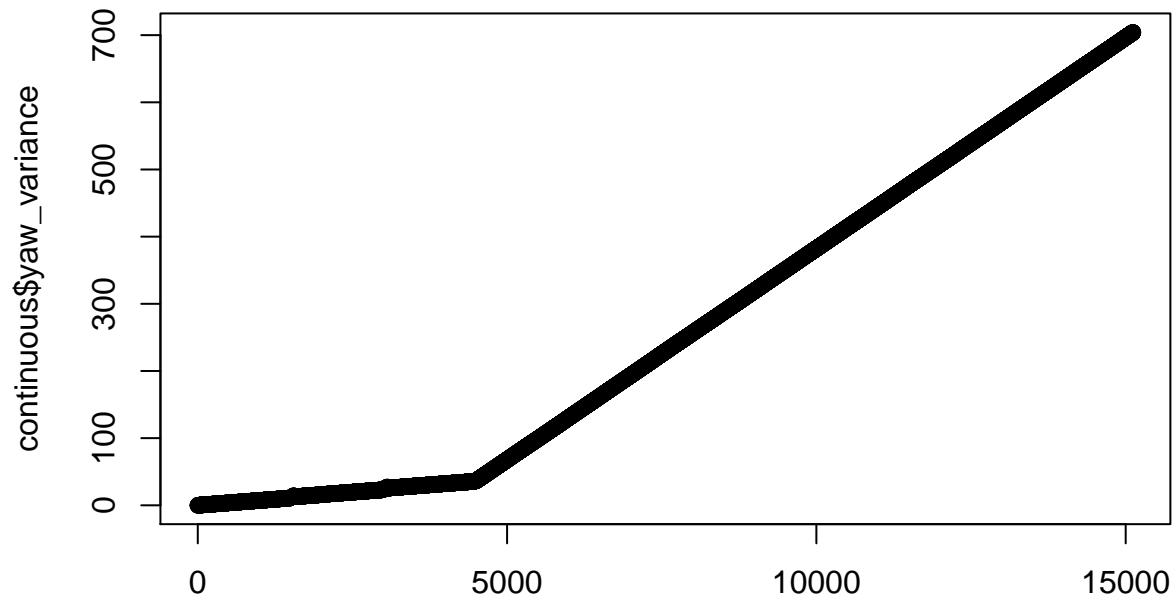
Continuous Filter X Variance Over Time



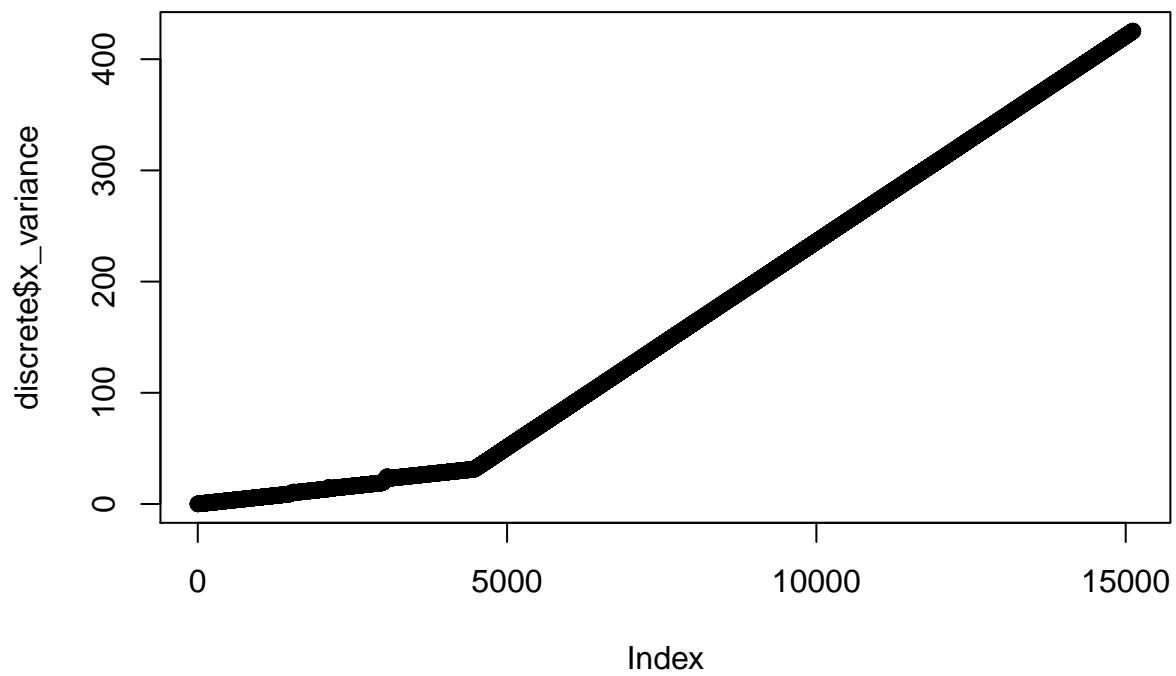
Continuous Filter Y Variance Over Time



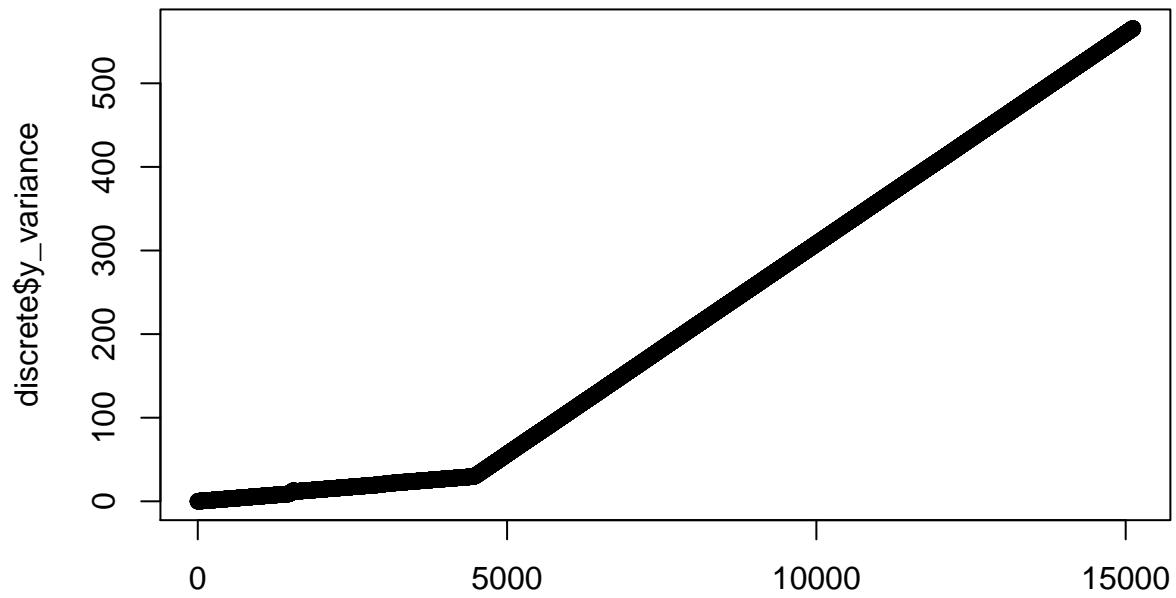
Continuous Filter Yaw Variance Over Time



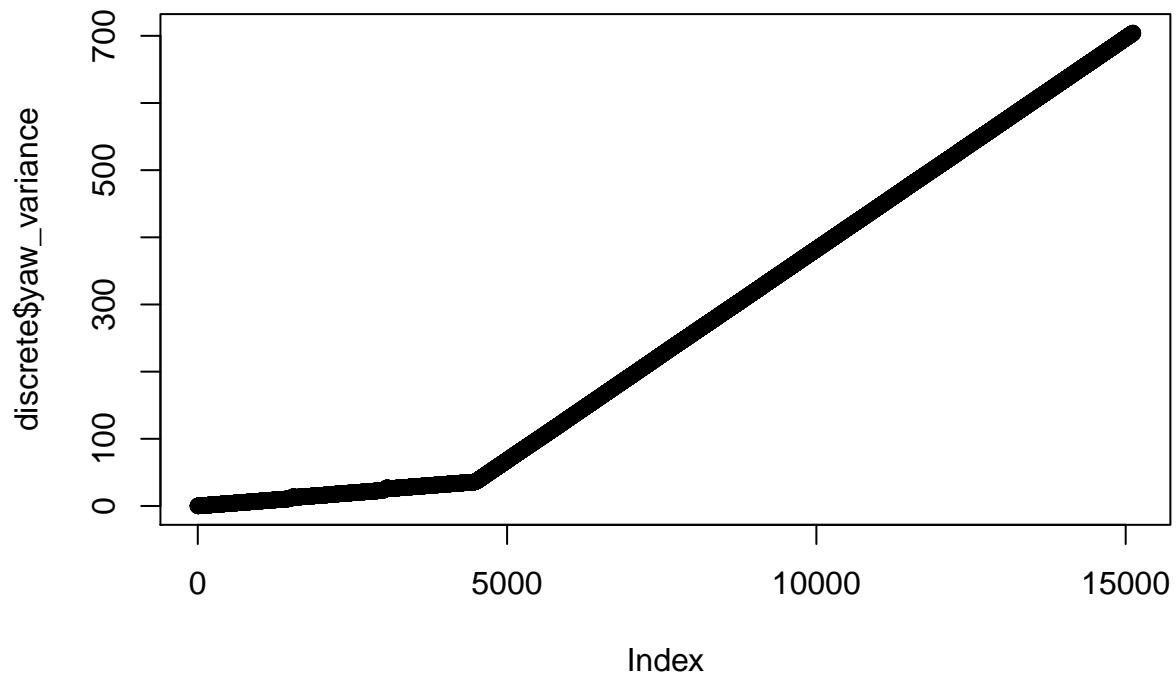
Discrete Filter X Variance Over Time



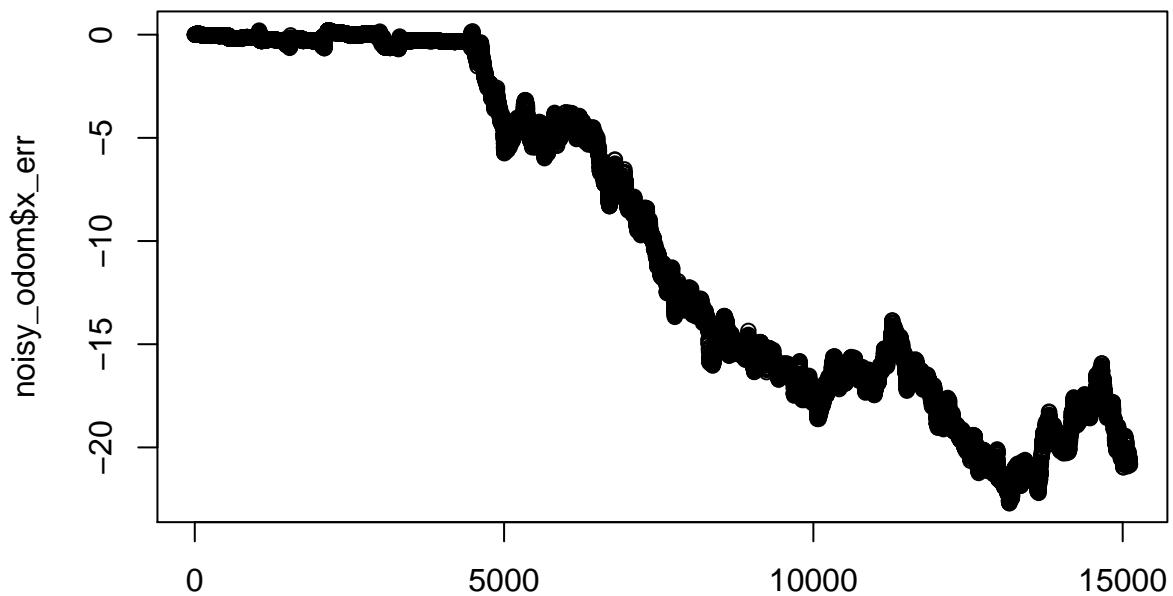
Discrete Filter Y Variance Over Time



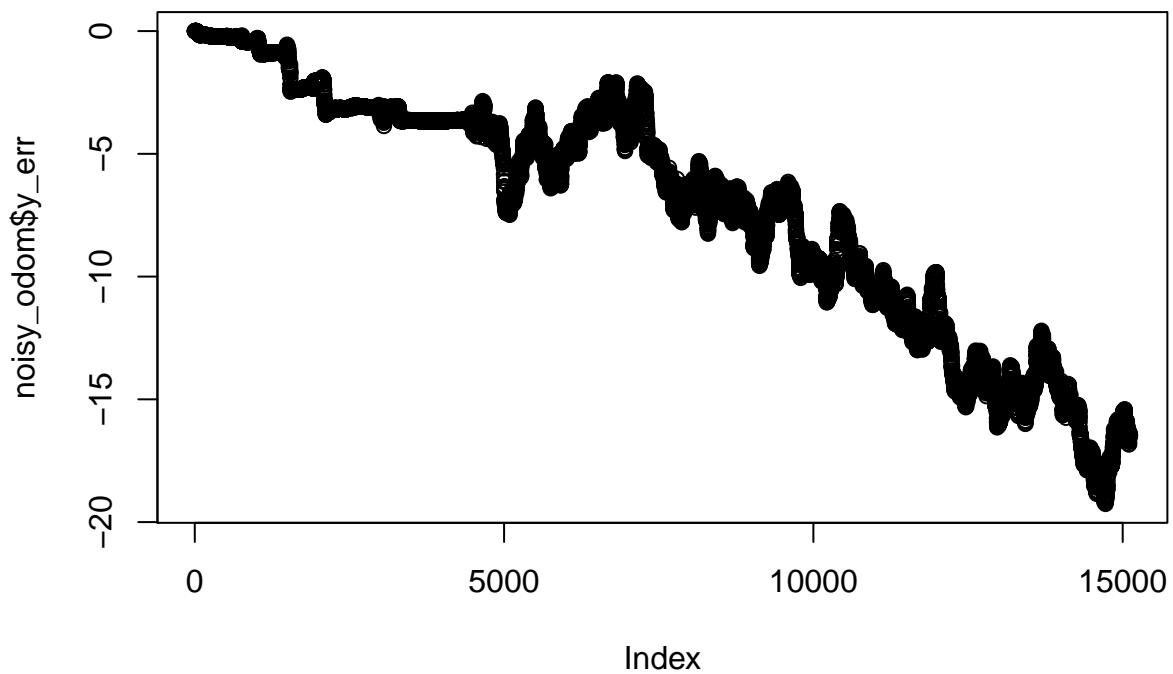
Discrete Filter Yaw Variance Over Time



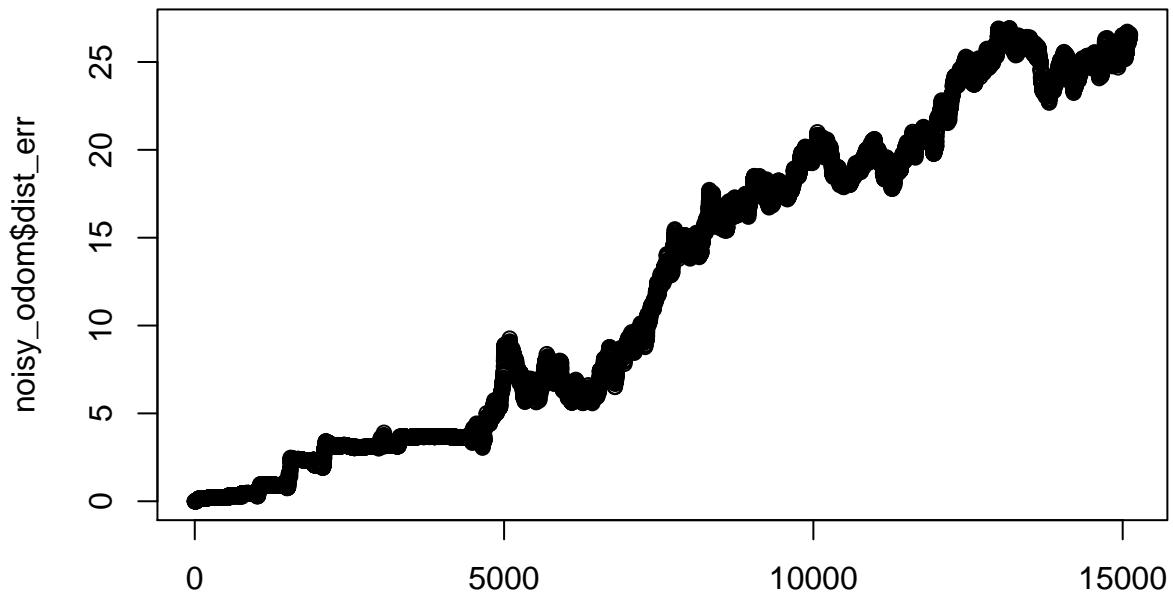
Noisy Odom X Error Over Time



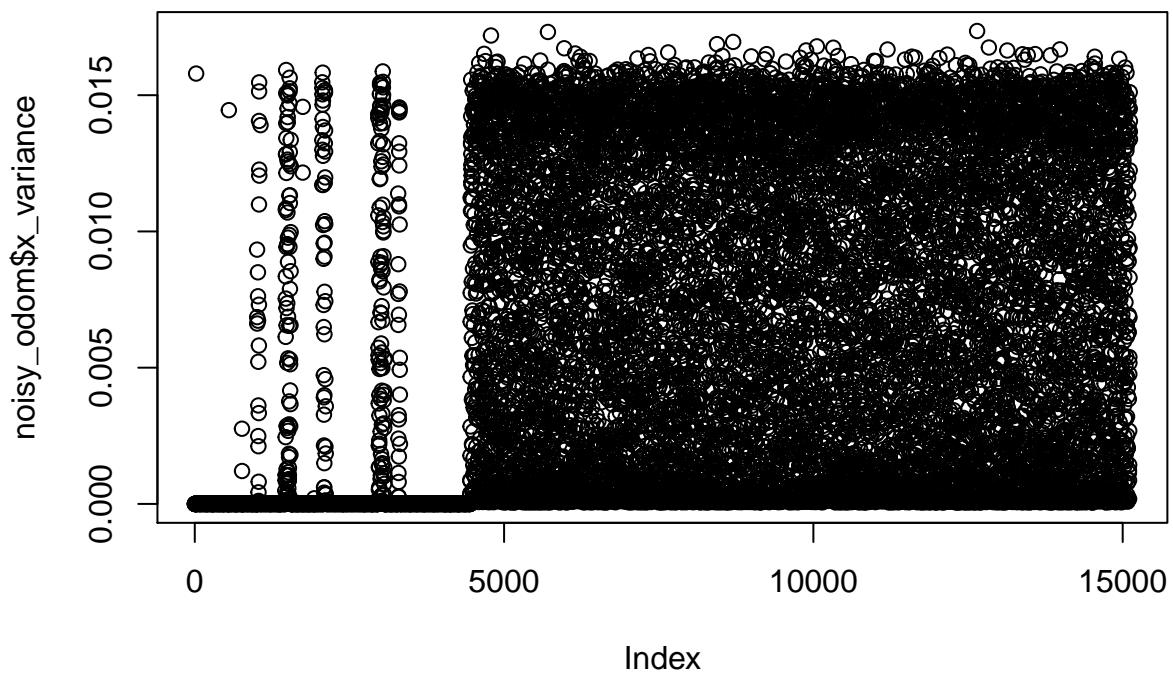
Noisy Odom Y Error Over Time



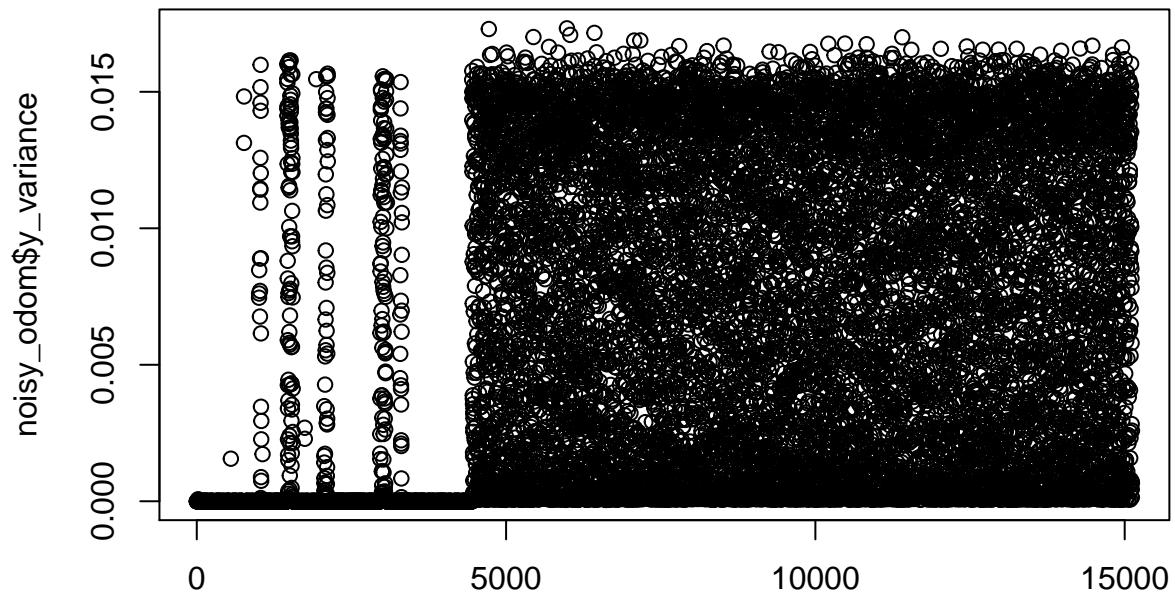
Noisy Odom Horizontal Distance Error Over Time



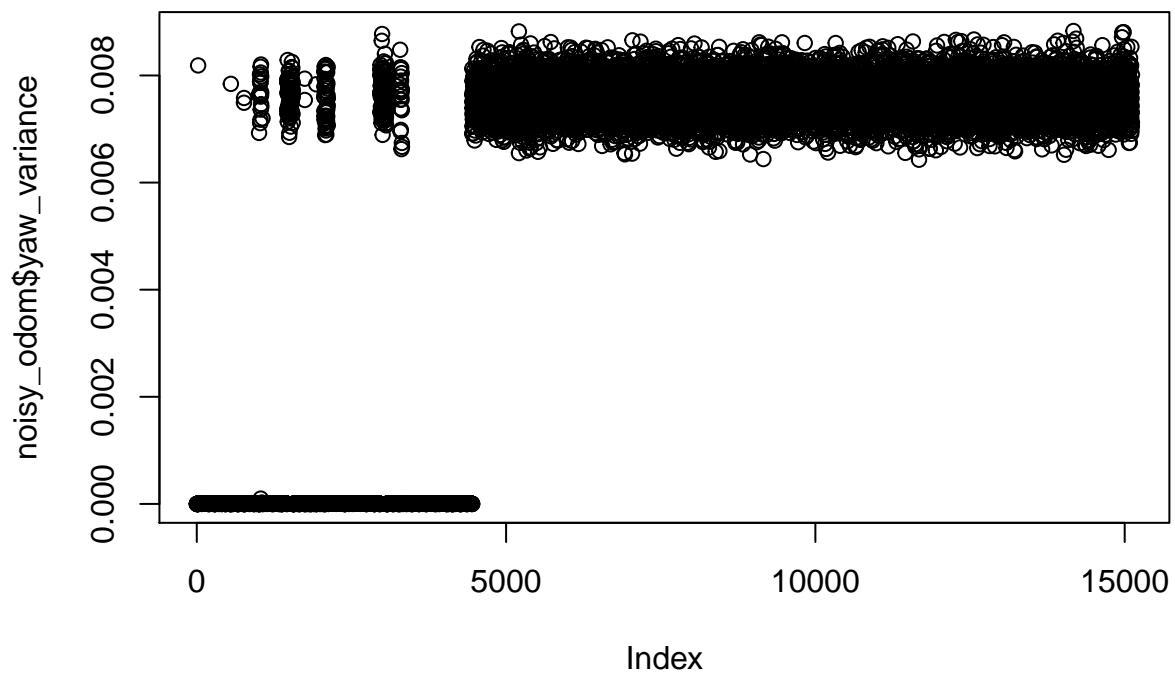
Variance of X Coordinate in Noisy Odometry



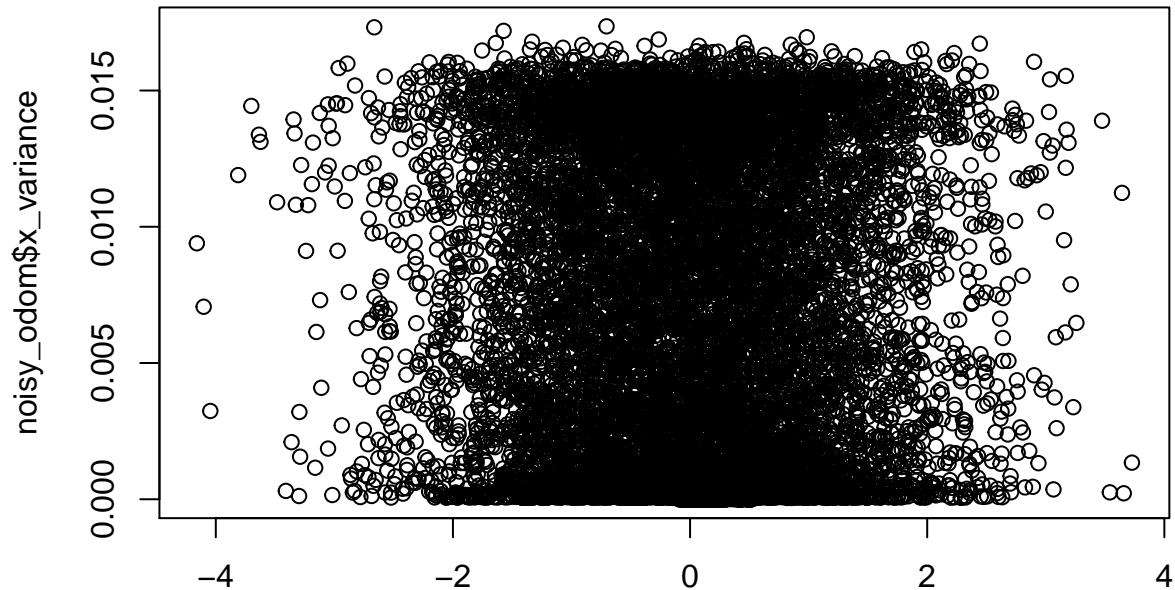
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

