

one_stationary_noiseless_no_gps Turtlebot 1 Report

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

The runtime of this experiment was 0 hours, 0 minutes, and 47.4 seconds.

The total number of external pose measurements recieved 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.
## 1.044e-06 1.145e-06 1.162e-06 1.387e-06 1.337e-06 2.433e-06
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 7.524e-10 1.324e-08 2.506e-08 2.557e-08 3.776e-08 5.149e-08
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 3.325e-05 8.997e-05 1.026e-04 1.025e-04 1.160e-04 1.714e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.044e-06 1.145e-06 1.162e-06 1.387e-06 1.337e-06 2.433e-06
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.044e-06 1.144e-06 1.160e-06 1.352e-06 1.293e-06 2.328e-06
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 7.549e-10 1.316e-08 2.468e-08 2.501e-08 3.688e-08 4.961e-08
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 2.599e-05 8.727e-05 9.809e-05 9.900e-05 1.118e-04 1.678e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.044e-06 1.145e-06 1.161e-06 1.353e-06 1.294e-06 2.328e-06
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.070e-06 2.456e-06 3.793e-06 3.821e-06 4.848e-06 8.109e-06
```

```
summary(noisy_odom$y_err)
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -2.830e-09 -2.200e-09 -1.922e-09 -1.880e-09 -1.454e-09 -6.043e-10
```

```
summary(noisy_odom$dist_err)
```

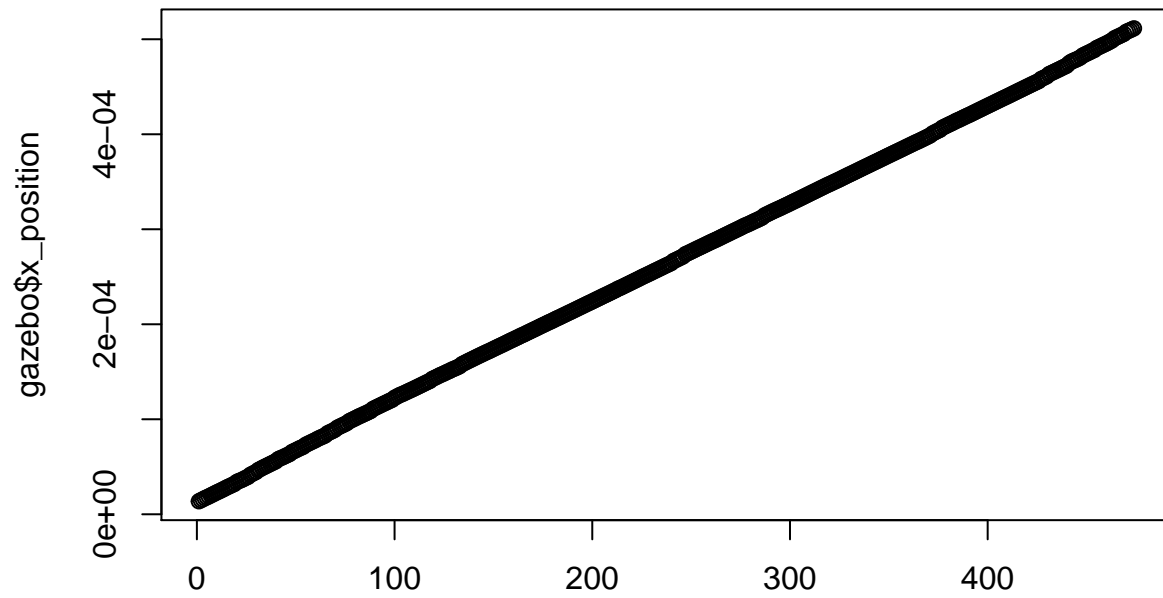
```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.070e-06 2.456e-06 3.793e-06 3.821e-06 4.848e-06 8.109e-06
```

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

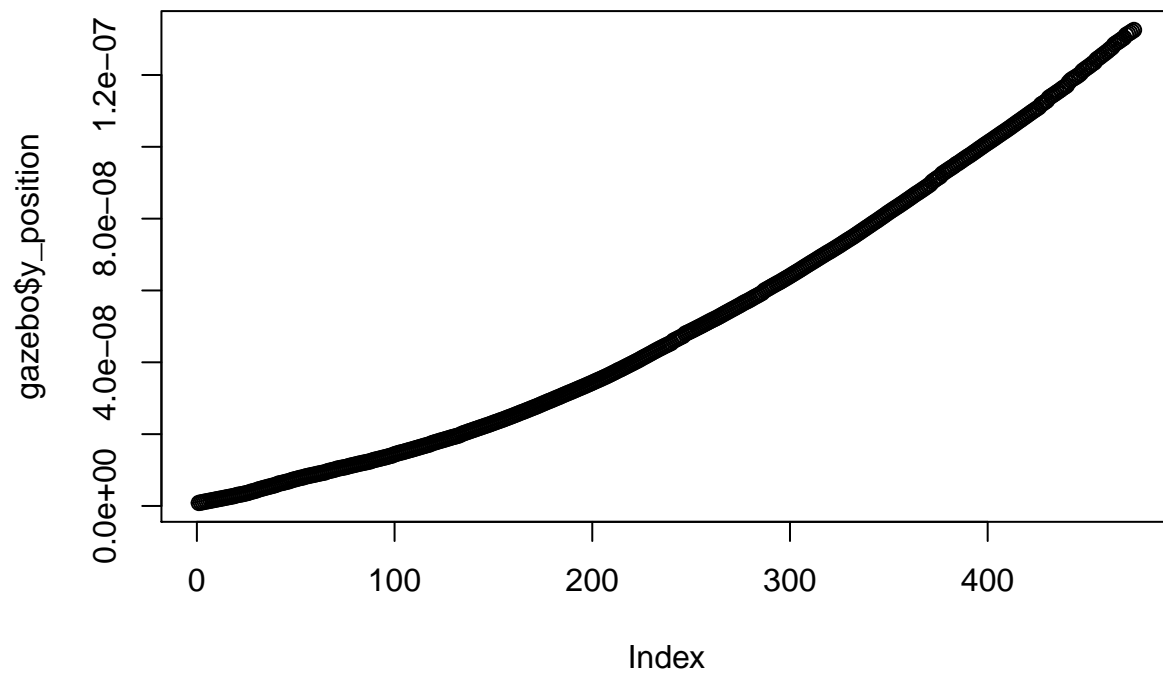
if (NROW(noisy_odom) > 0) {
  summary(noisy_odom$x_variance)
  summary(noisy_odom$y_variance)
  summary(noisy_odom$yaw_variance)
}
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 9.000e-16 9.979e-15 1.964e-14 2.648e-14 3.575e-14 2.817e-13
```

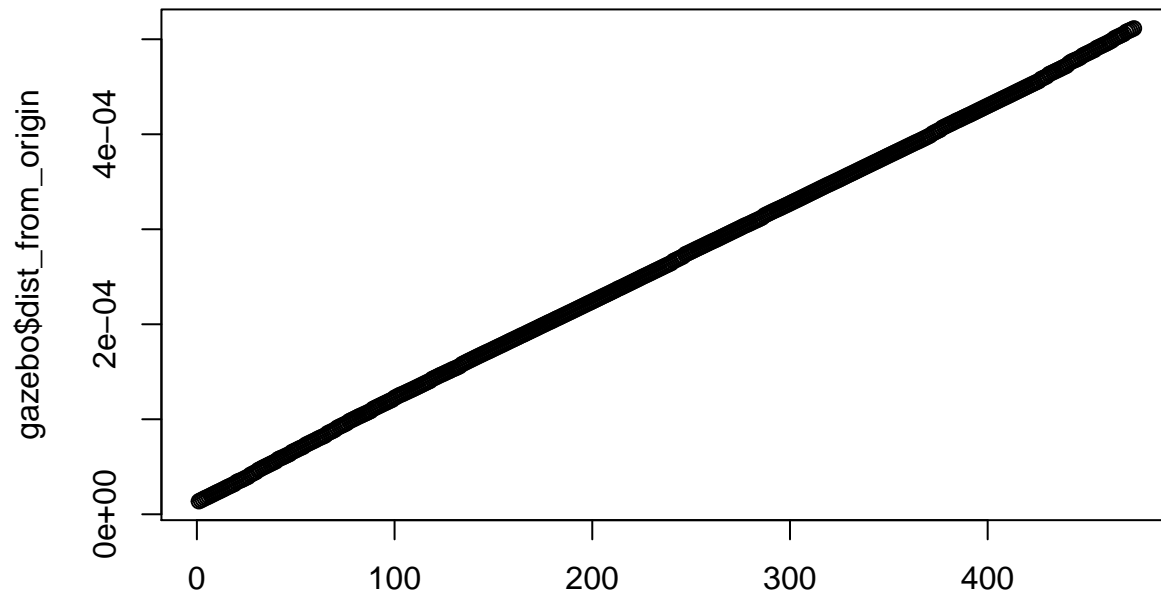
X coordinate of robot over time



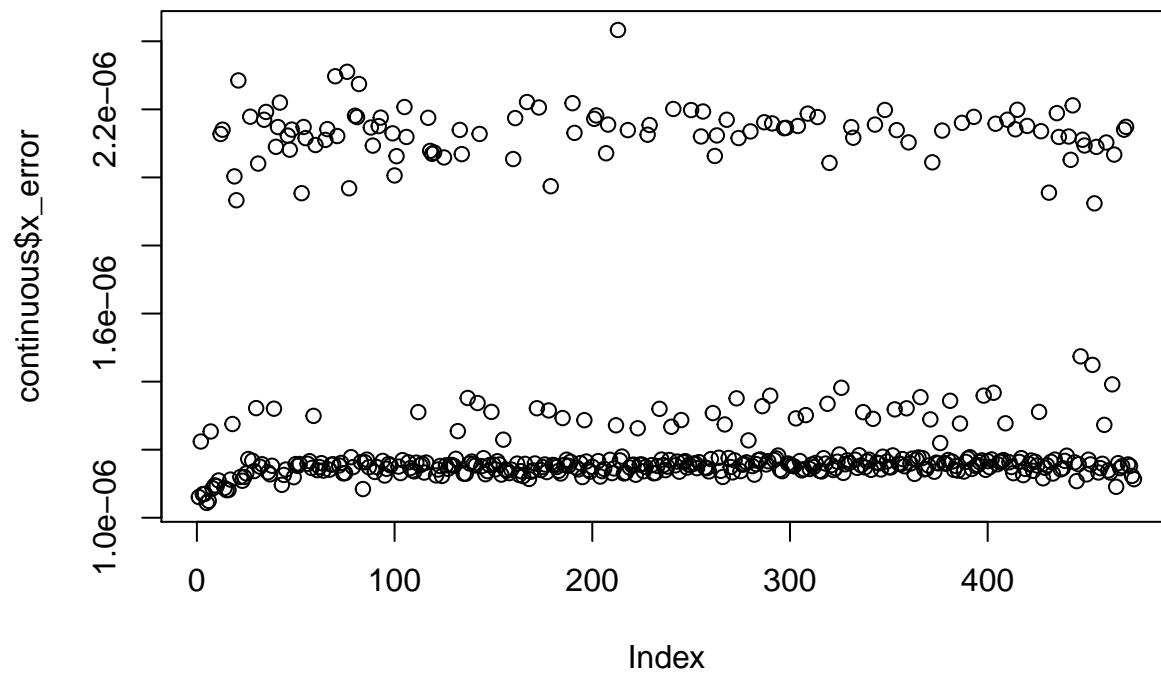
Y coordinate of robot over time



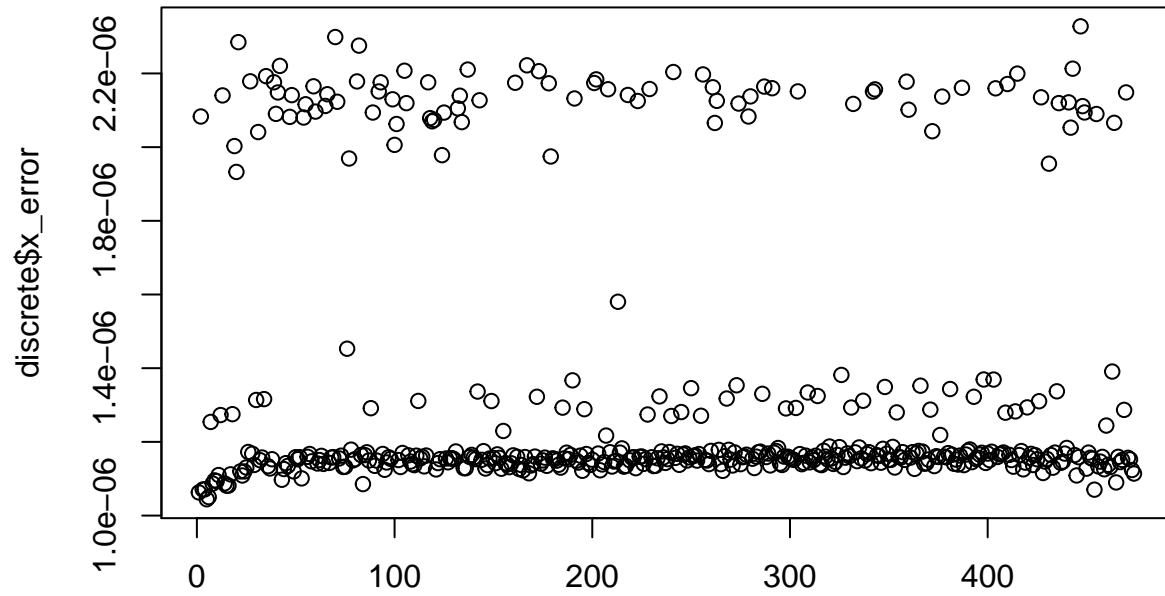
Distance from origin vs. time



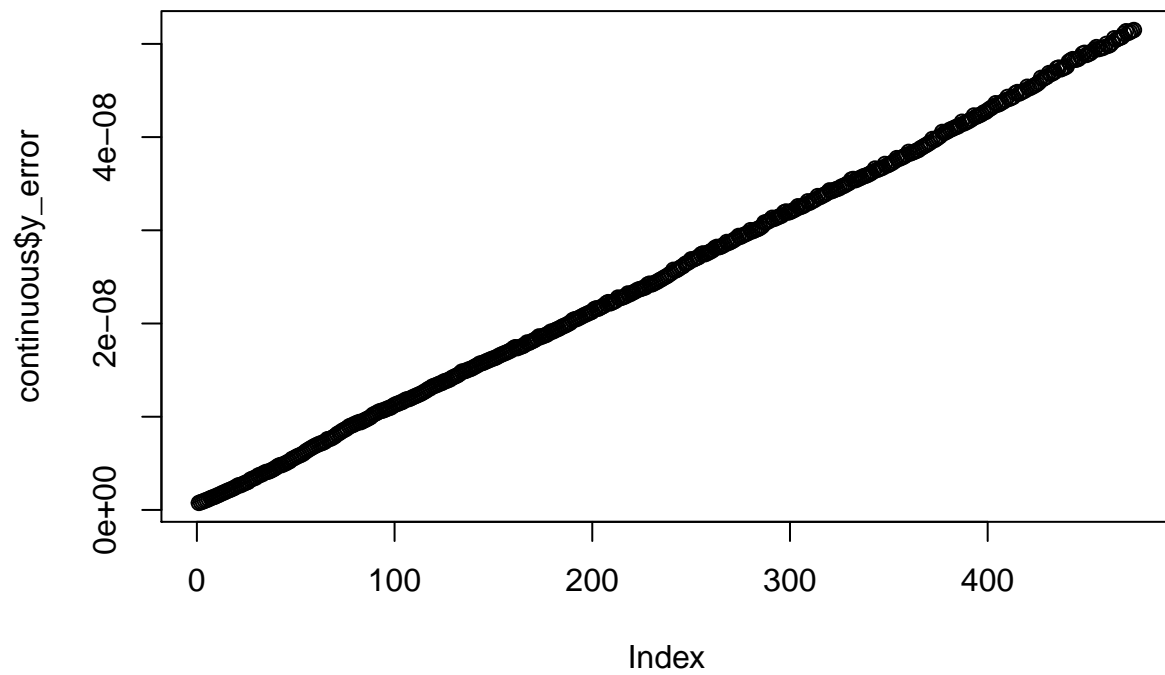
Continuous x_error over time



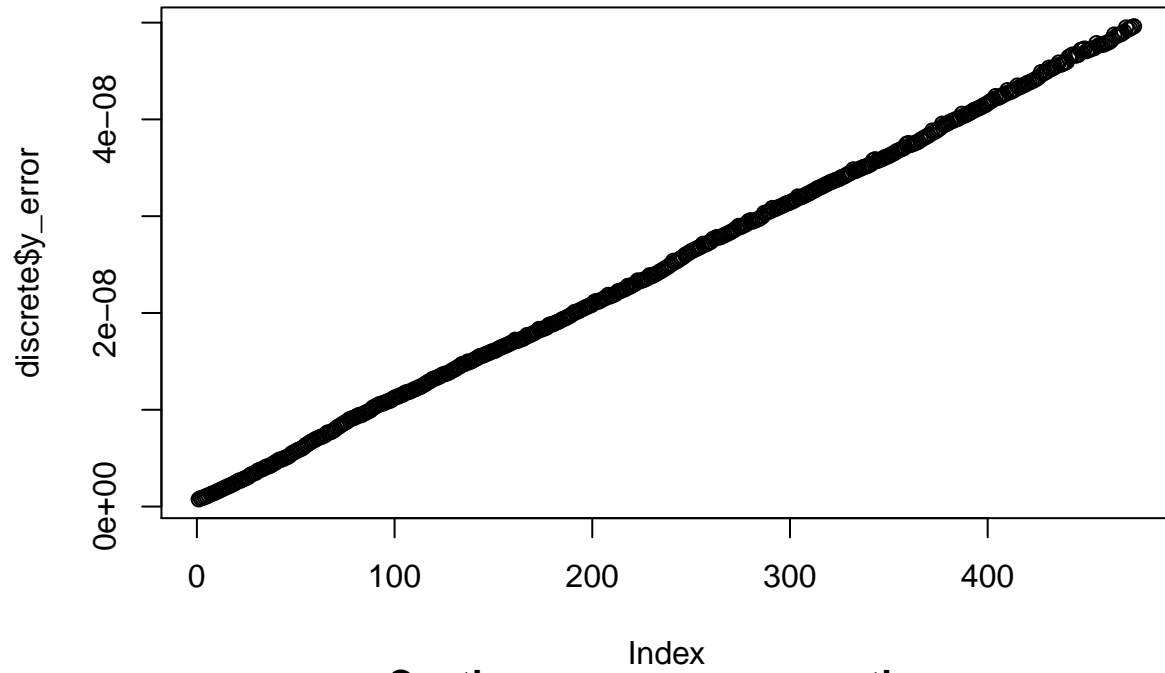
Discrete x_error over time



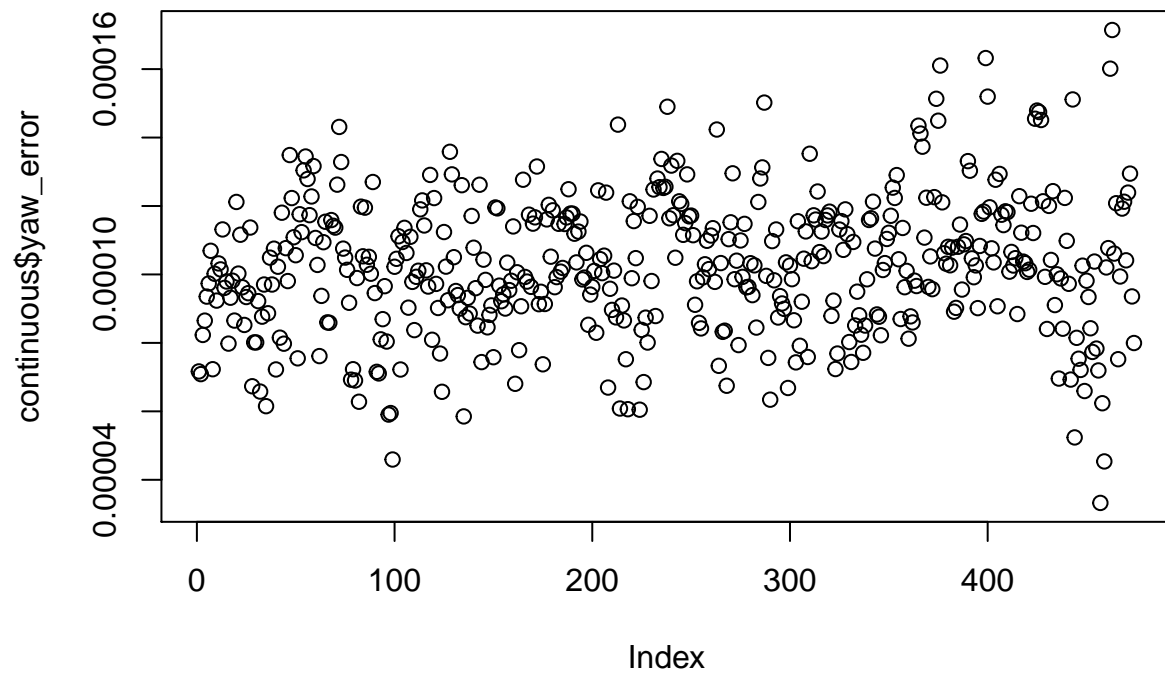
Continuous y_error over time



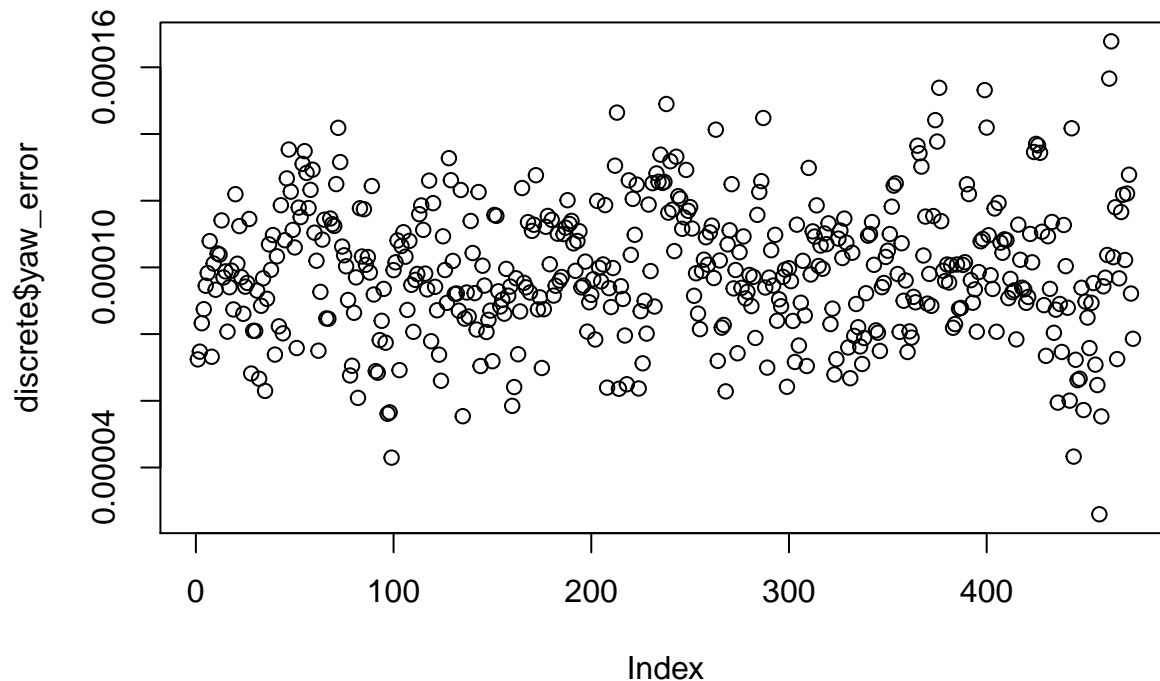
Discrete y_error over time



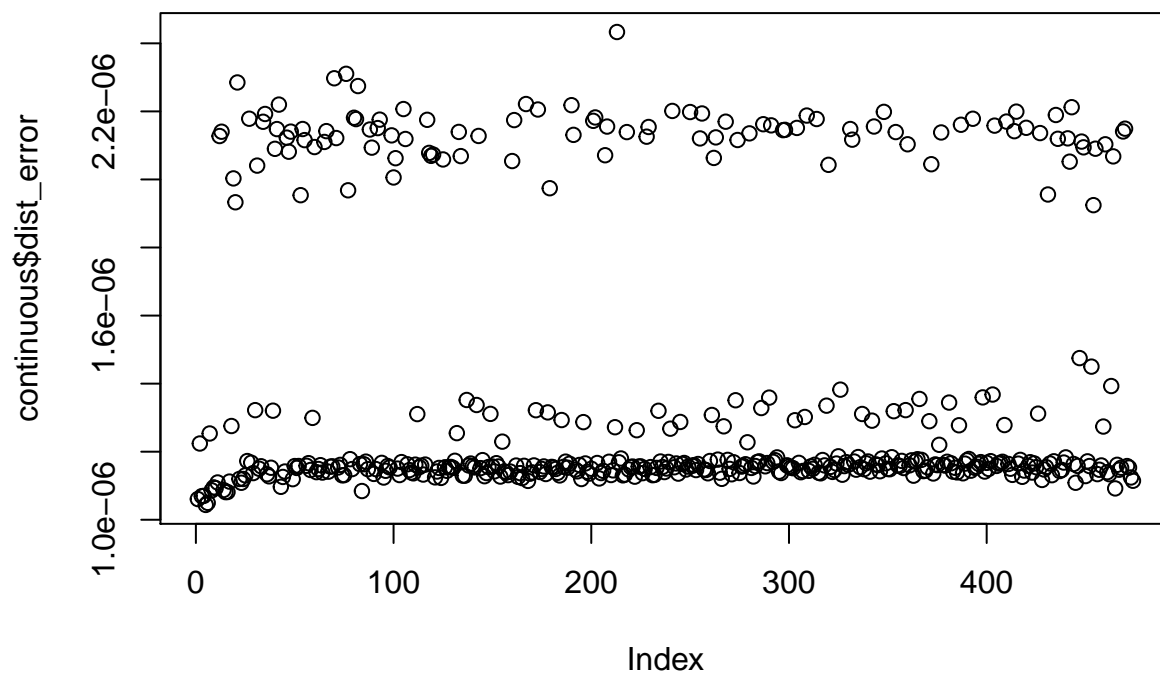
Continuous yaw error over time



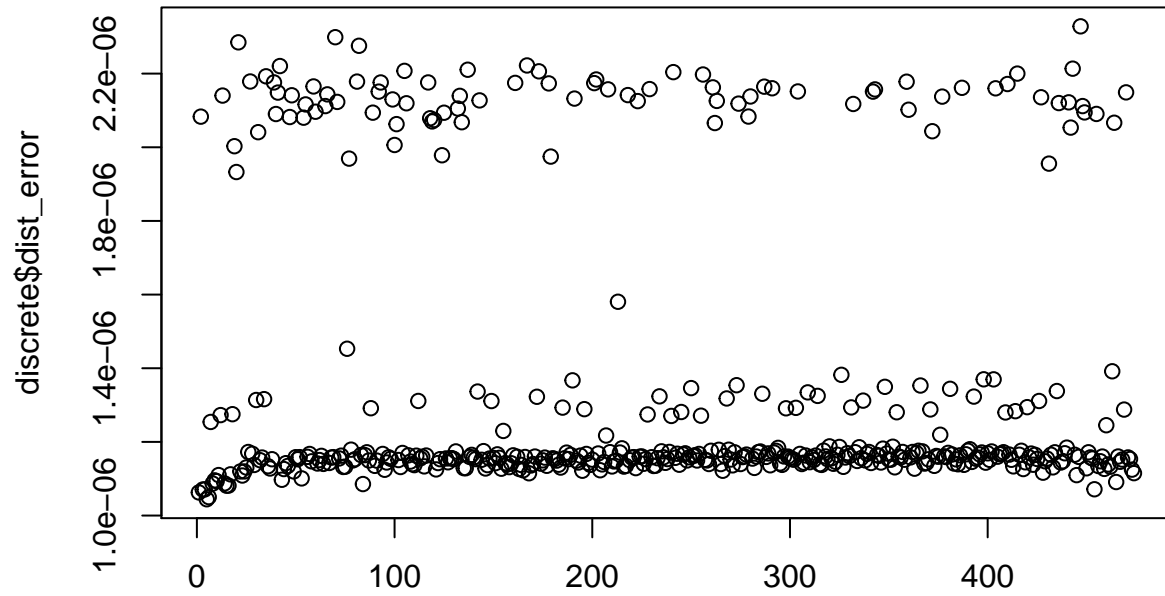
Discrete yaw error over time



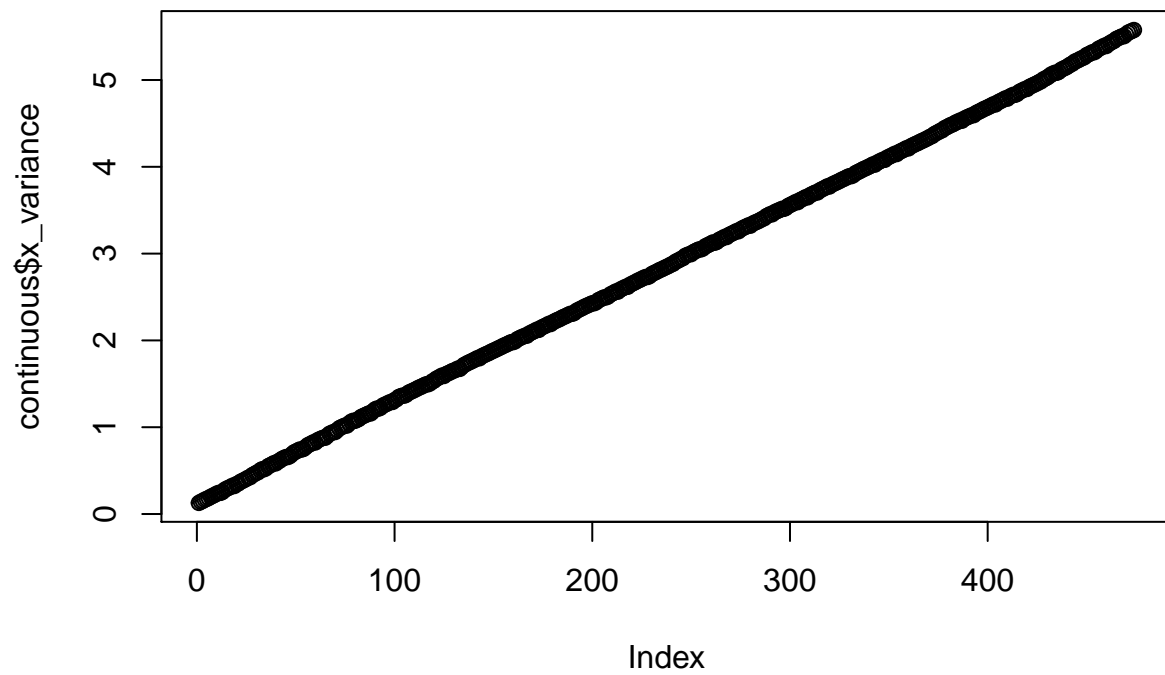
Continuous total distance error over time



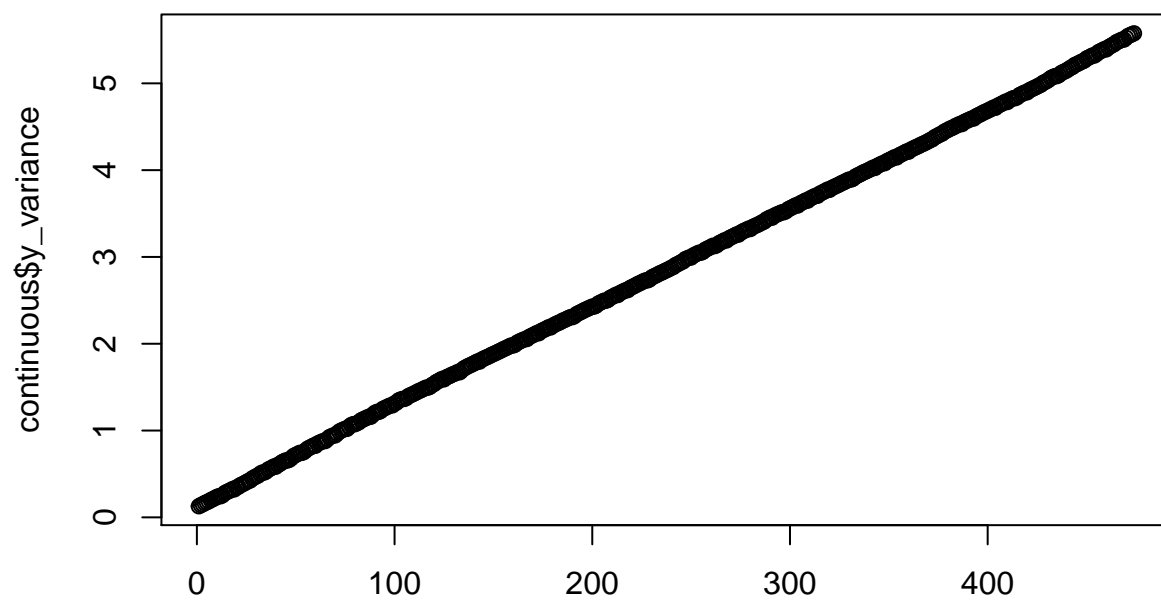
Discrete total distance error over time



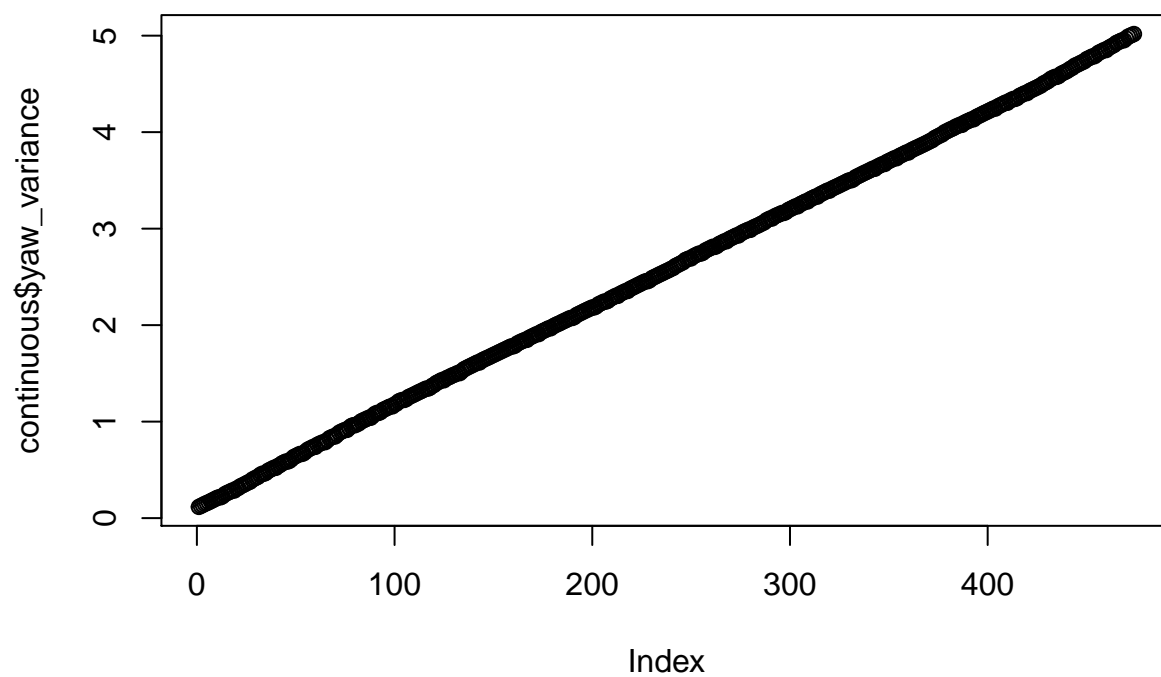
Continuous Filter X Variance Over Time



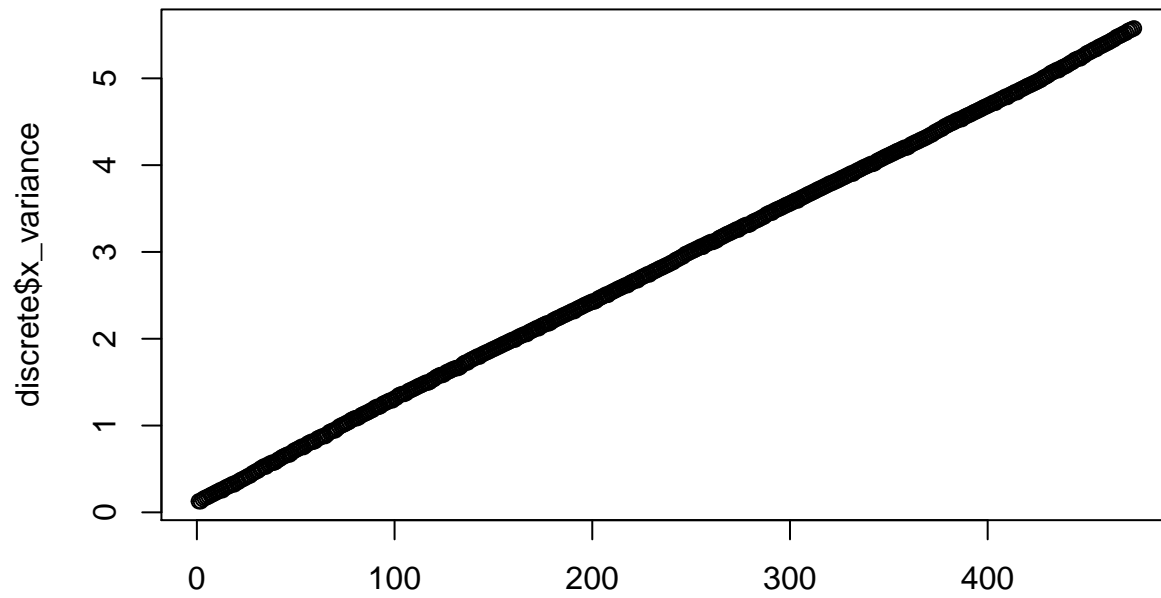
Continuous Filter Y Variance Over Time



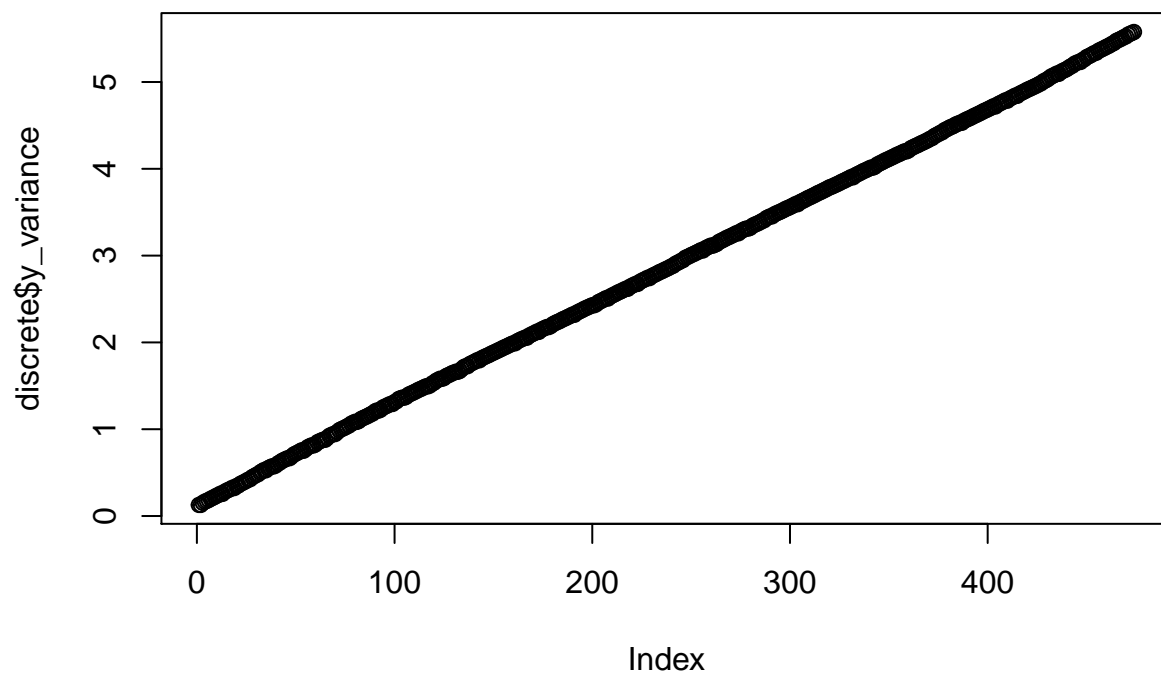
Continuous Filter Yaw Variance Over Time



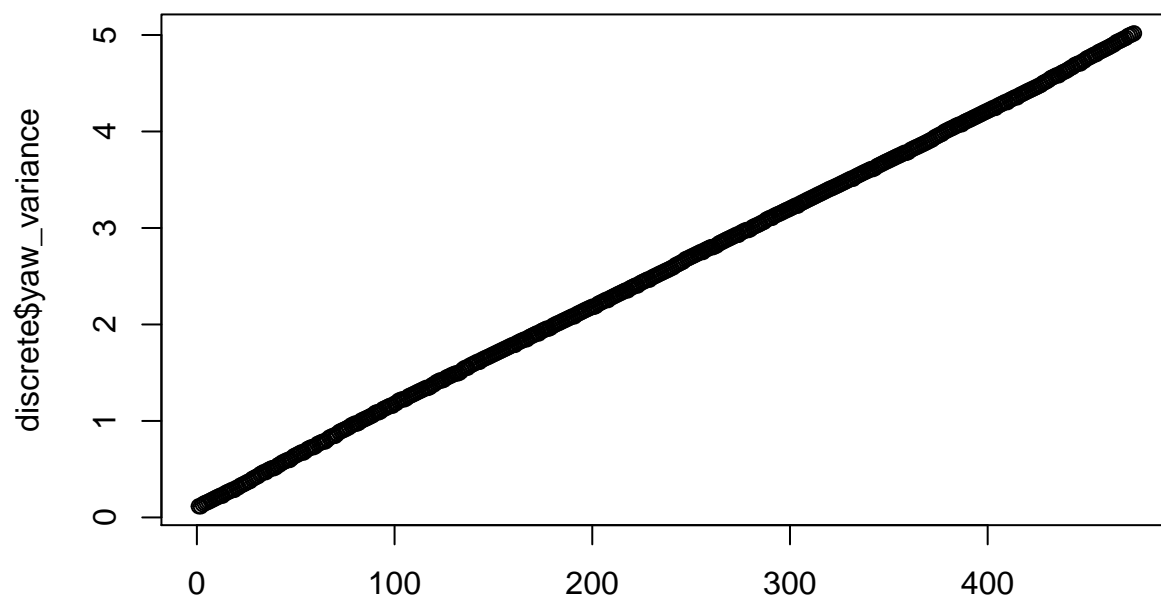
Discrete Filter X Variance Over Time



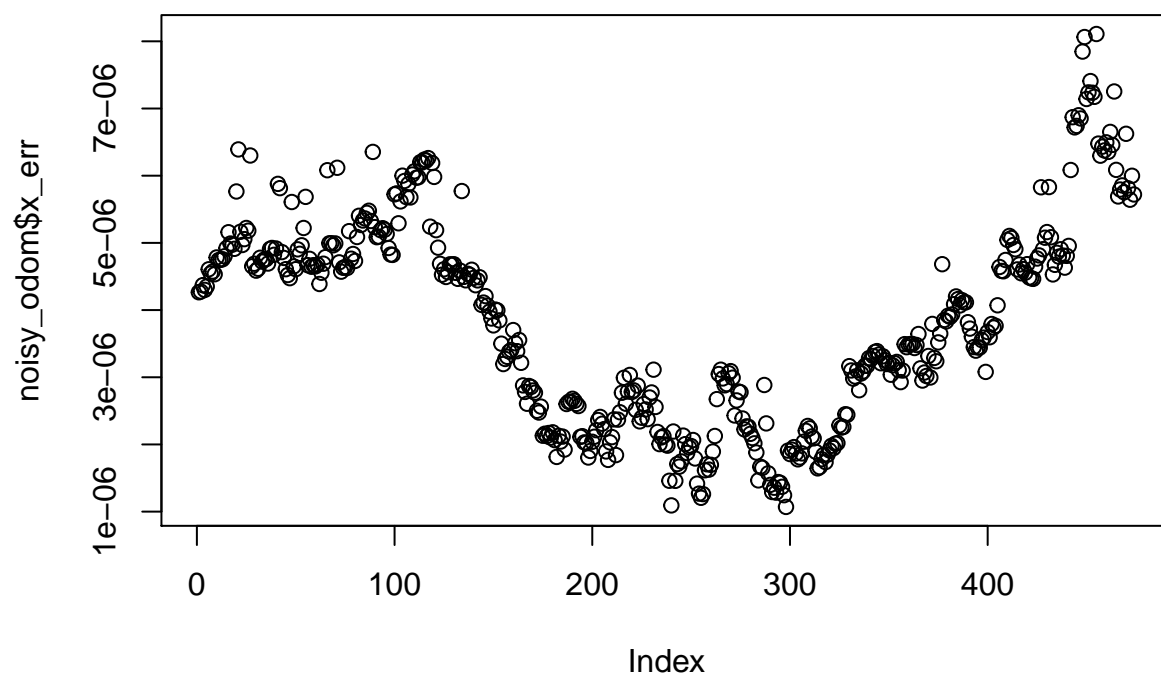
Discrete Filter Y Variance Over Time



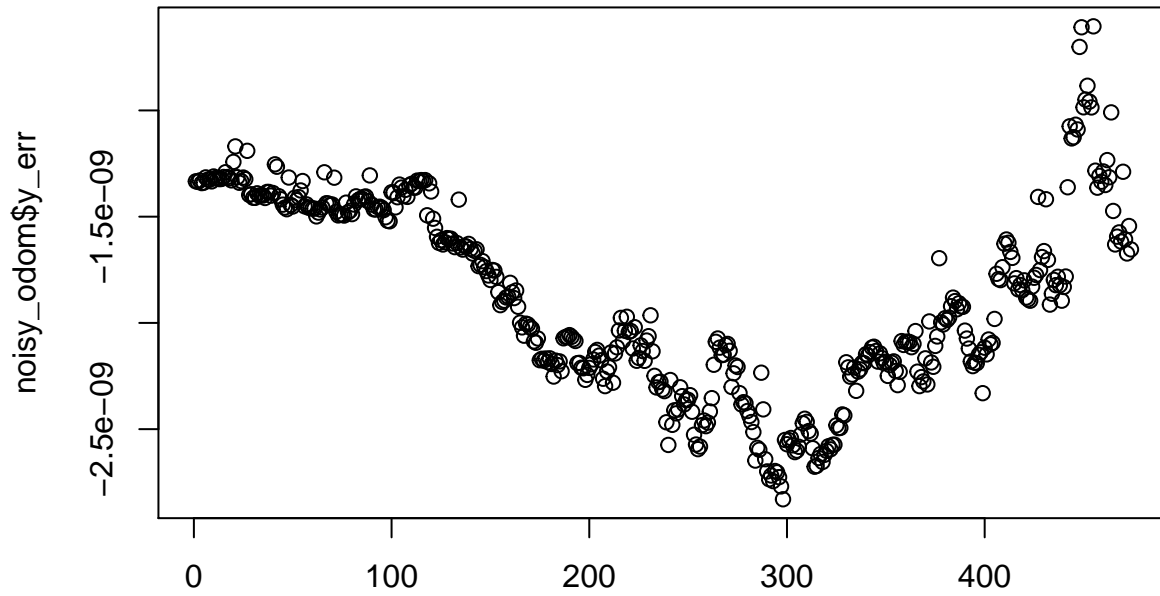
Discrete Filter Yaw Variance Over Time



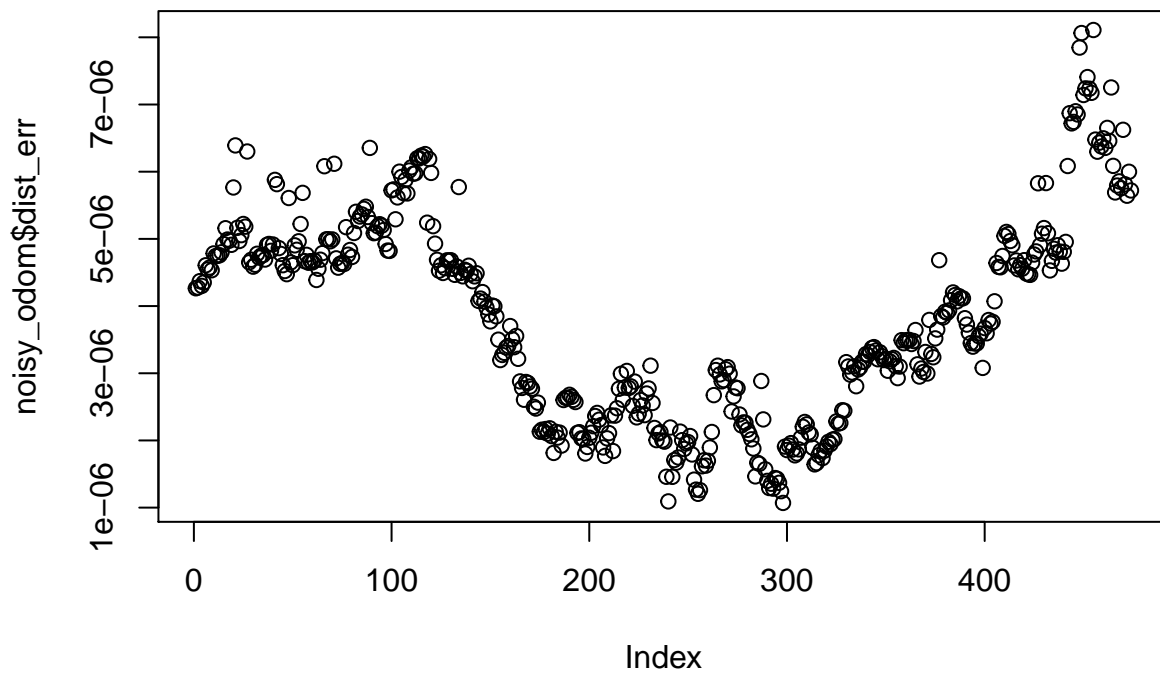
Noisy Odom X Error Over Time



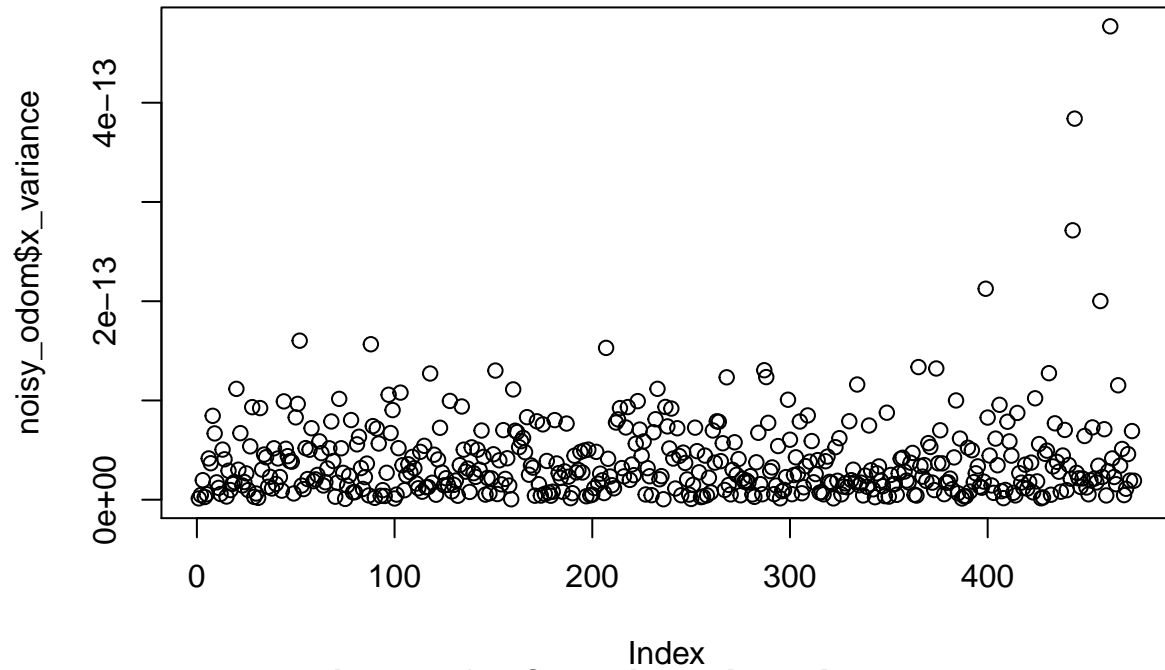
Noisy Odom Y Error Over Time



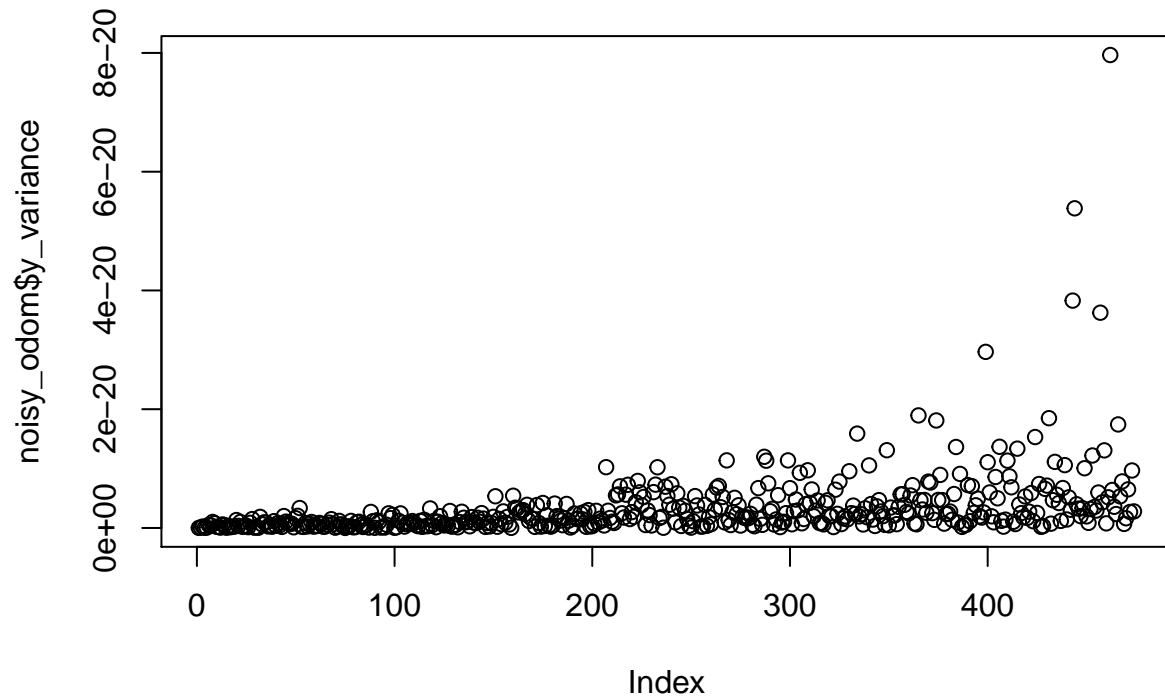
Noisy Odom Horizontal Distance Error Over Time



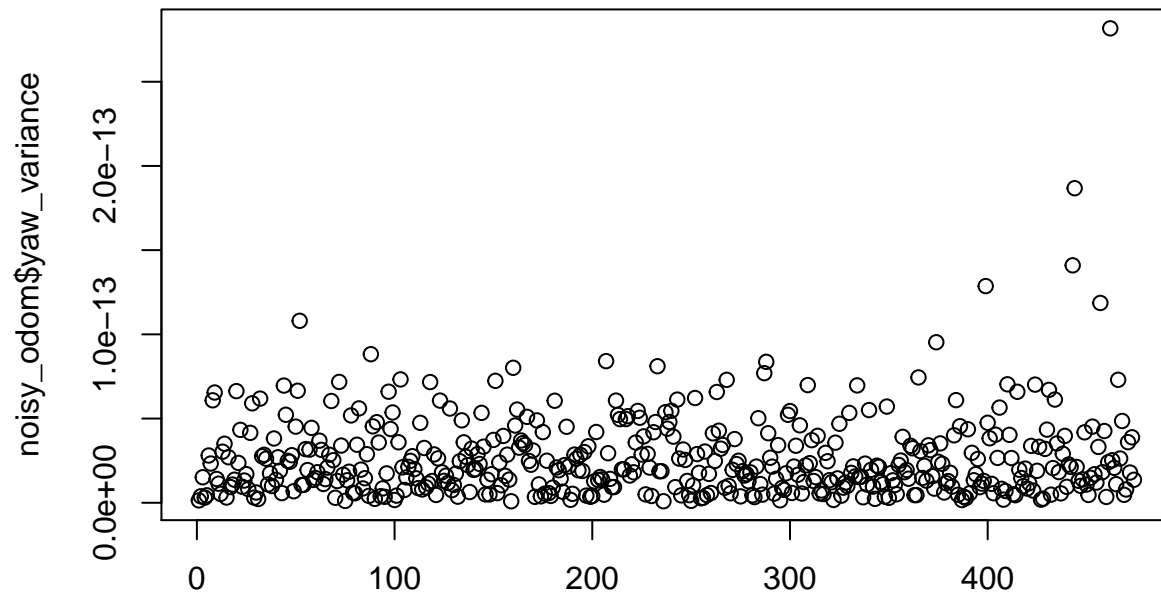
Variance of X Coordinate in Noisy Odometry



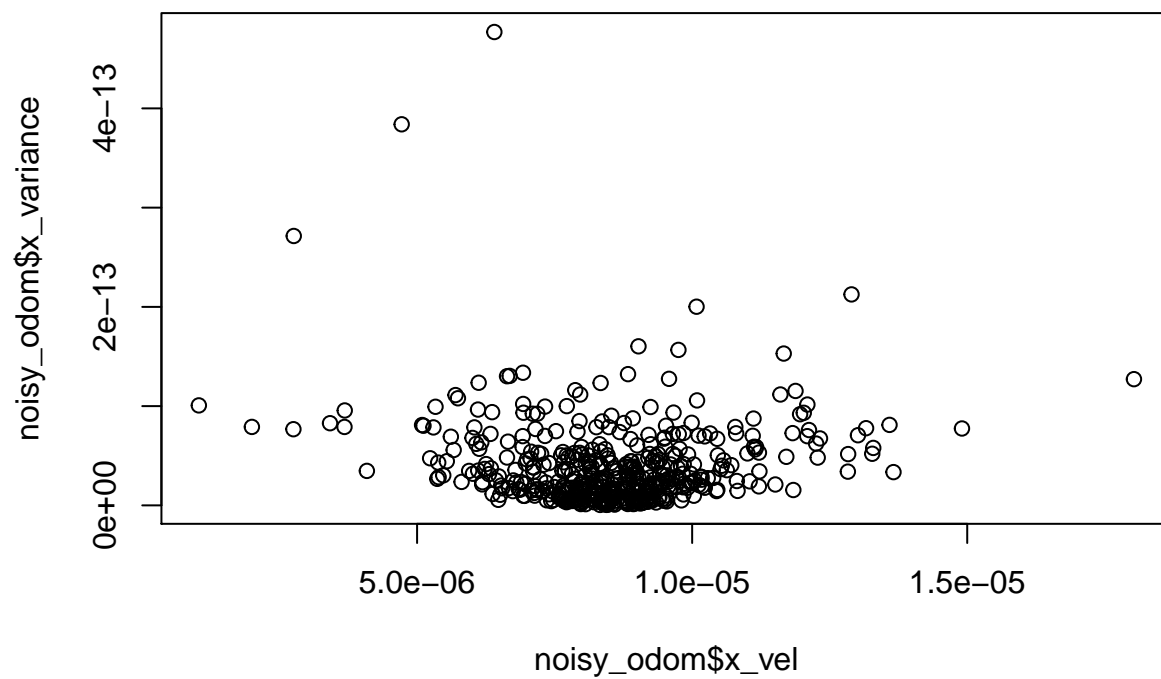
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

