two_stationary_noiseless_no_gps Turtlebot 1 Report

Matthew Swartwout

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

The runtime of this experiment was 0 hours, 0 minutes, and 49.7 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.
## 1.491e-05 1.393e-04 2.651e-04 2.650e-04 3.900e-04 5.147e-04
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.262e-09 2.742e-08 7.114e-08 7.862e-08 1.251e-07 1.904e-07
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.0001166 0.0003121 0.0003889 0.0003785 0.0004662 0.0006146
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.491e-05 1.393e-04 2.651e-04 2.650e-04 3.900e-04 5.147e-04
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.491e-05 1.393e-04 2.651e-04 2.650e-04 3.900e-04 5.147e-04
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.262e-09 2.742e-08 7.115e-08 7.862e-08 1.251e-07 1.904e-07
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.0001166 0.0003121 0.0003889 0.0003785 0.0004662 0.0006146
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.491e-05 1.393e-04 2.651e-04 2.650e-04 3.900e-04 5.147e-04
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 6.650e-05 6.972e-05 7.031e-05 7.005e-05 7.084e-05 7.267e-05
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## -1.944e-07 -1.836e-07 -1.723e-07 -1.727e-07 -1.617e-07 -1.518e-07
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 6.650e-05 6.972e-05 7.031e-05 7.005e-05 7.085e-05 7.267e-05
```

```r
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)
}
```
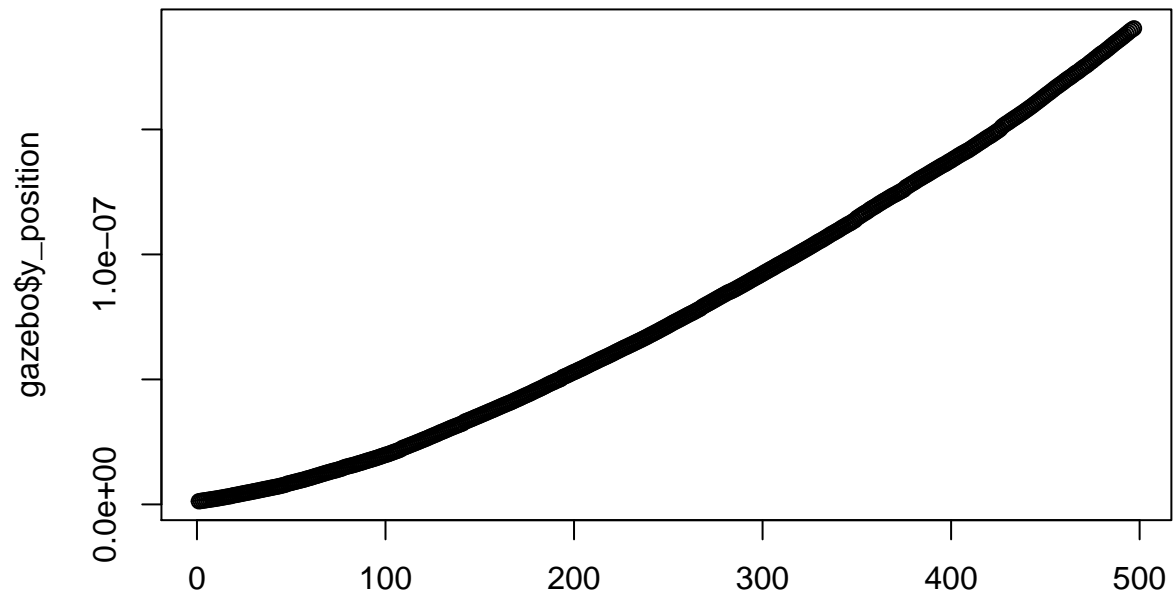
```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.199e-15 9.397e-15 1.836e-14 2.552e-14 3.184e-14 4.204e-13
```

X coordinate of robot over time
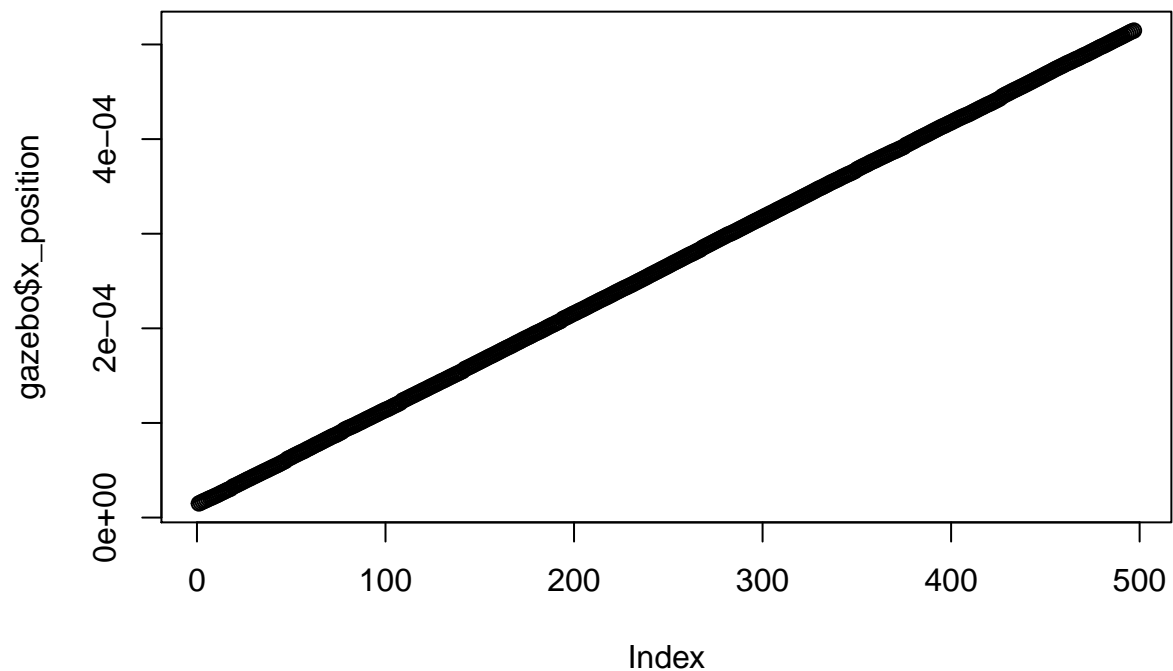
Y coordinate of robot over time

Distance from origin vs. time
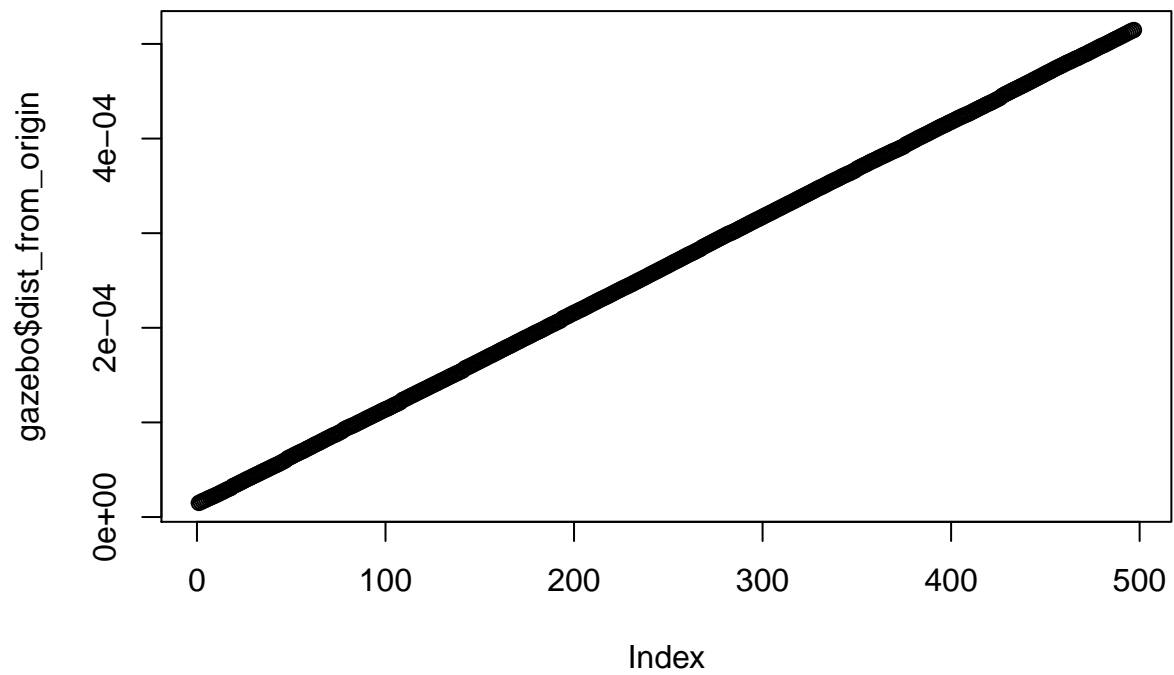
Continuous x_error over time
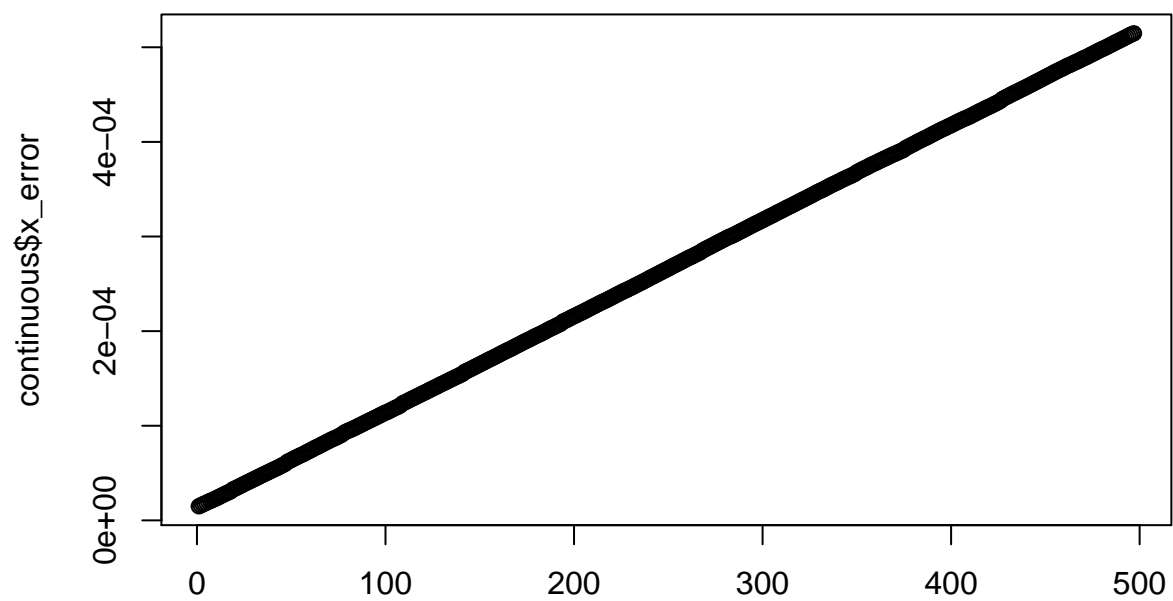
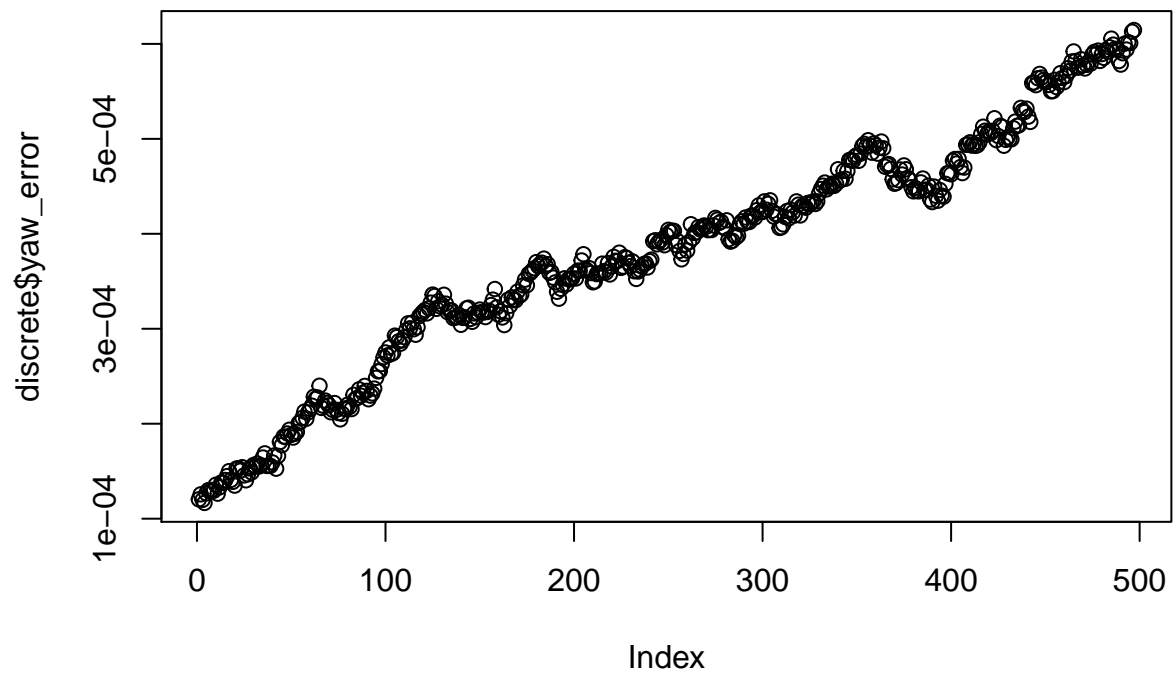# Discrete x_error over time
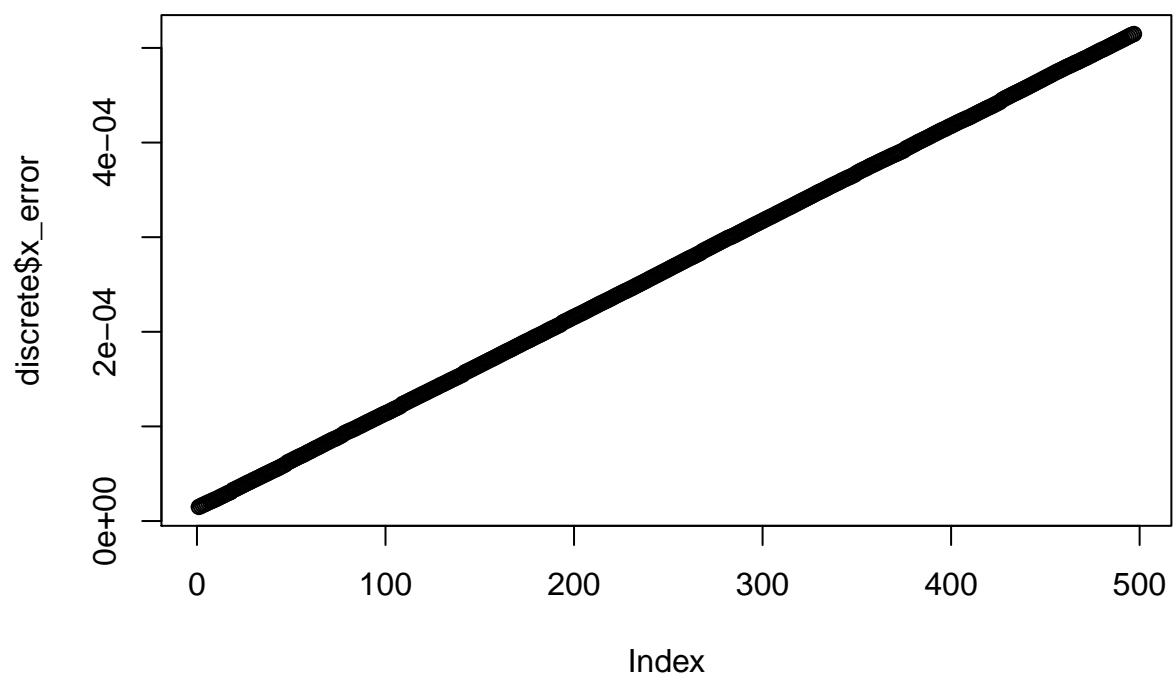
Continuous y_error over time
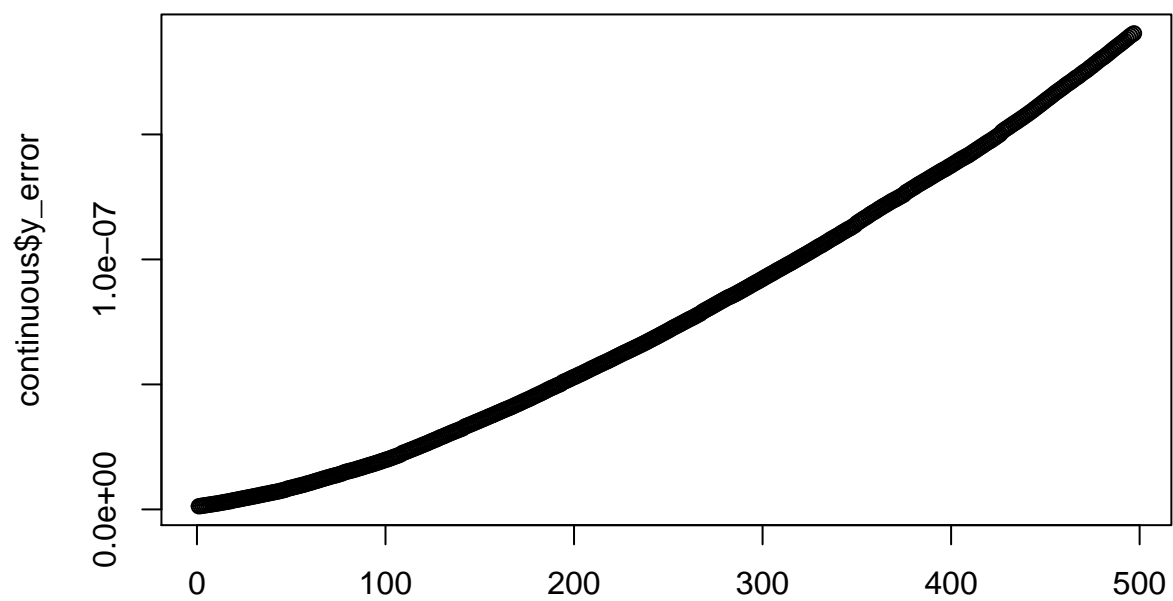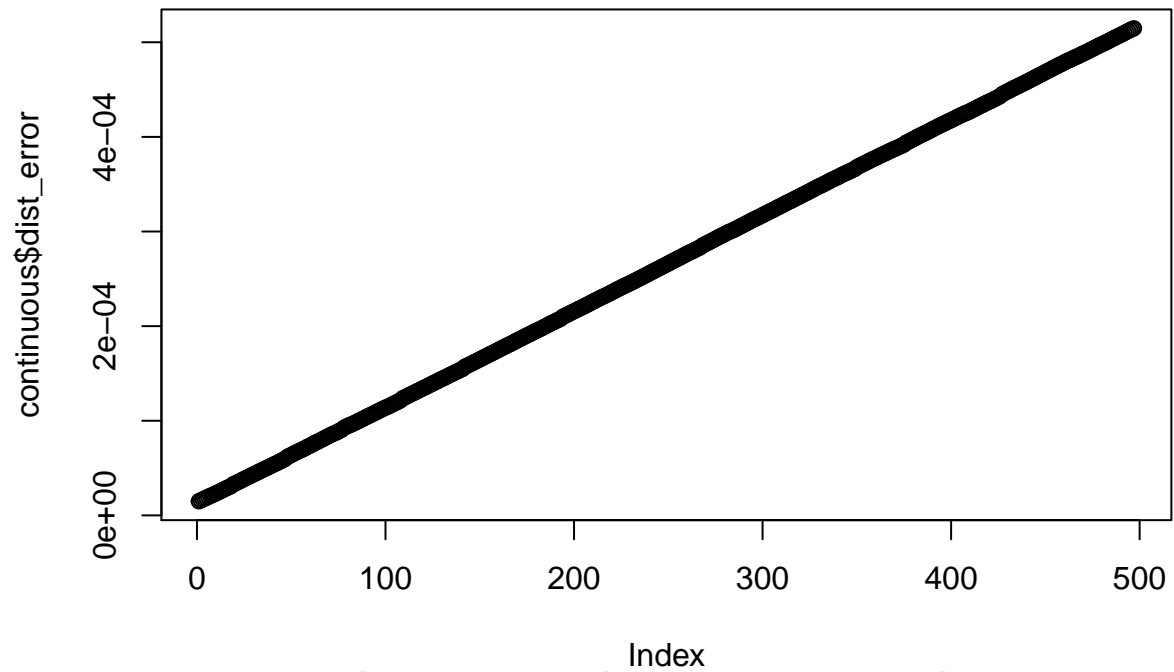

Discrete y_error over time
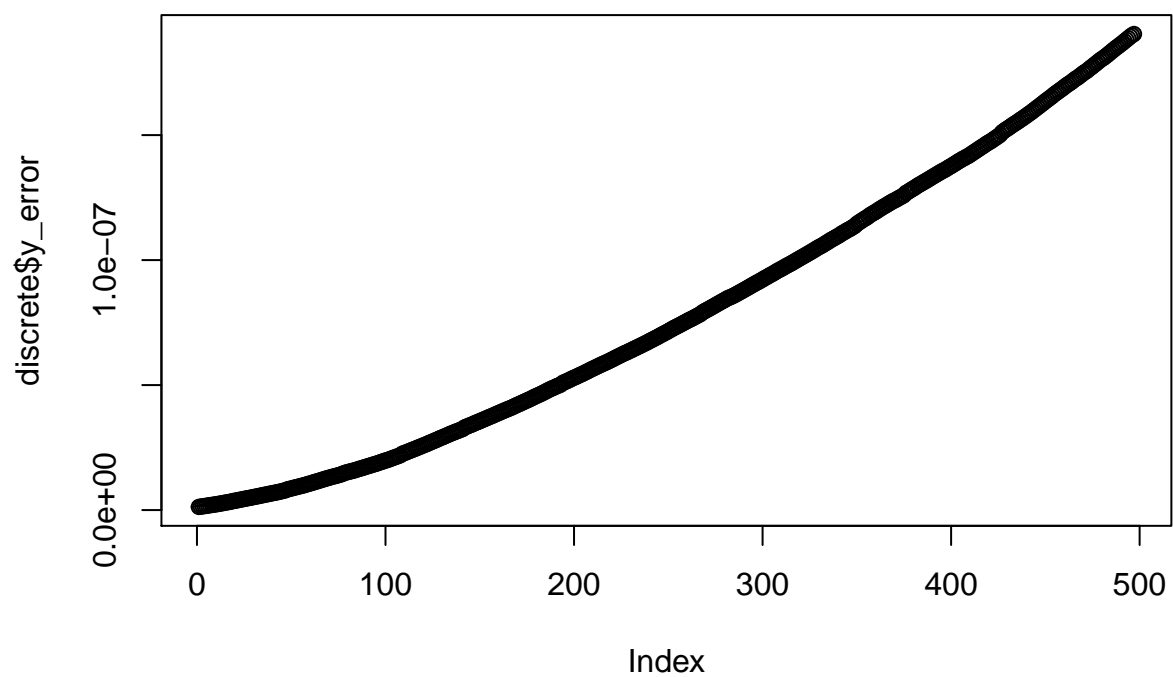
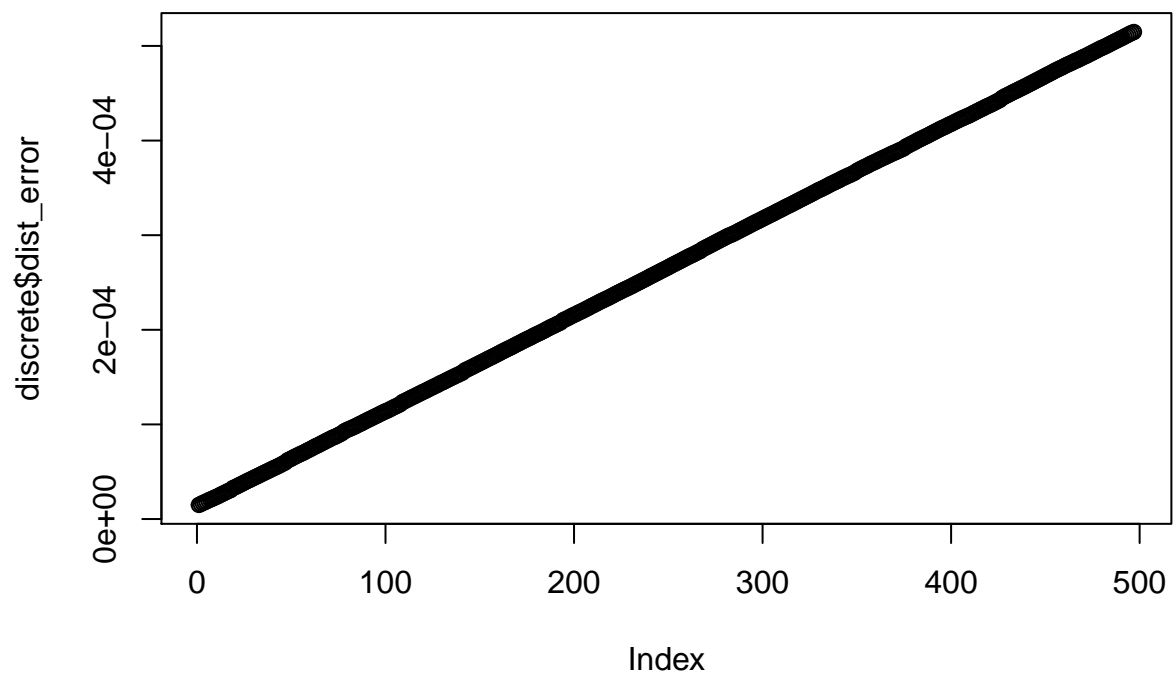## Continuous yaw error over time
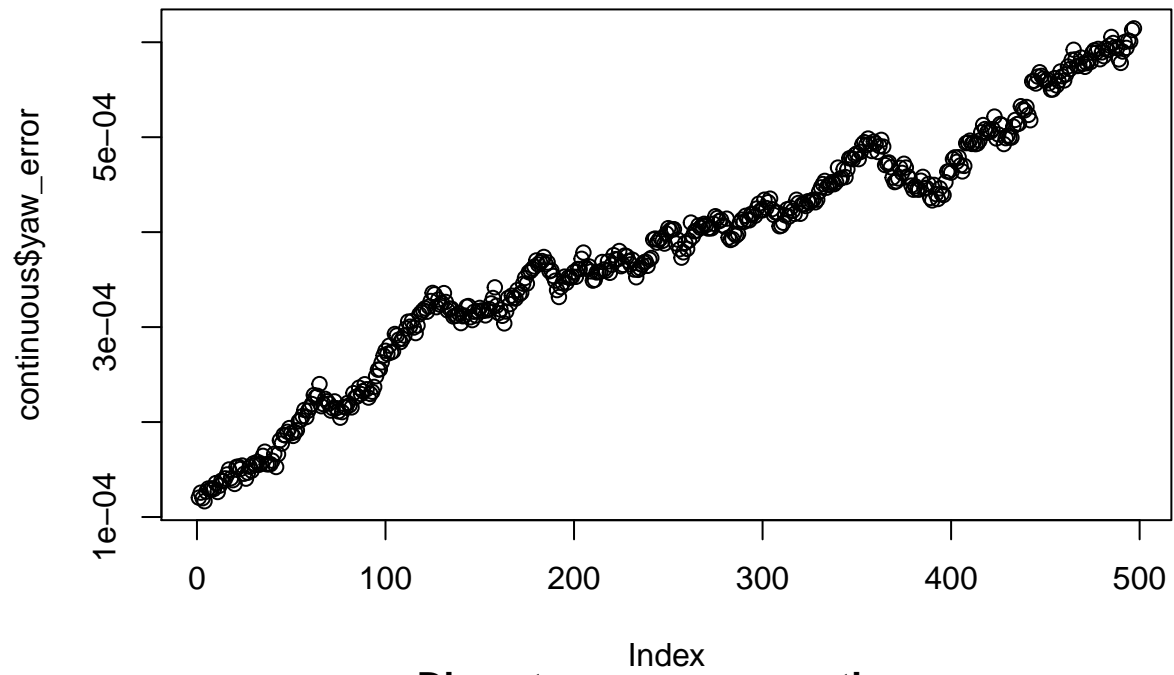
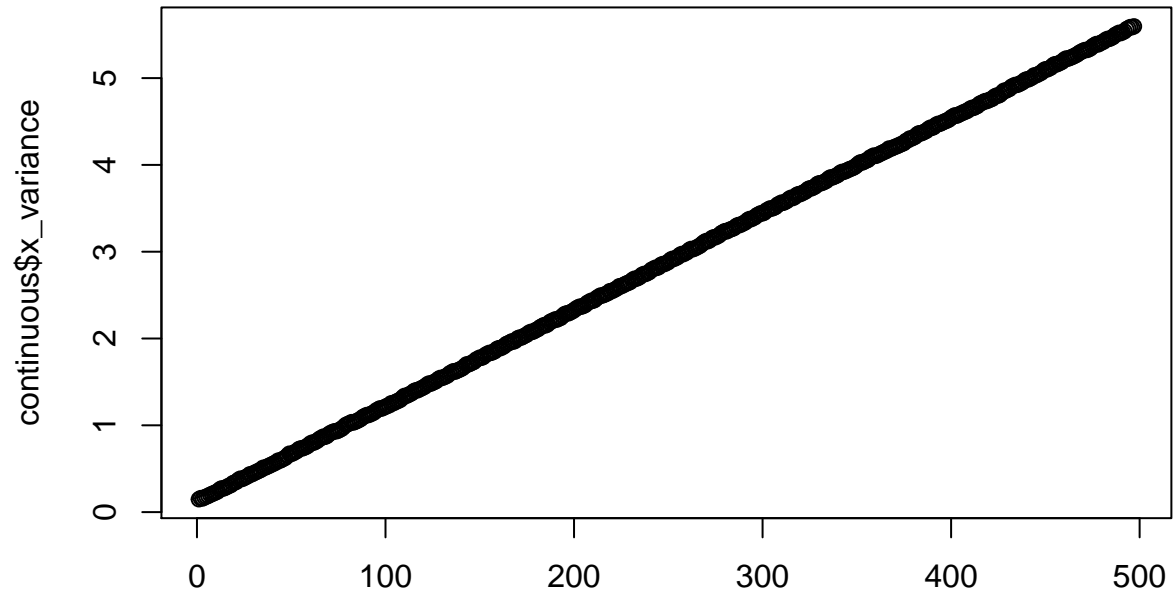## Discrete yaw error over time

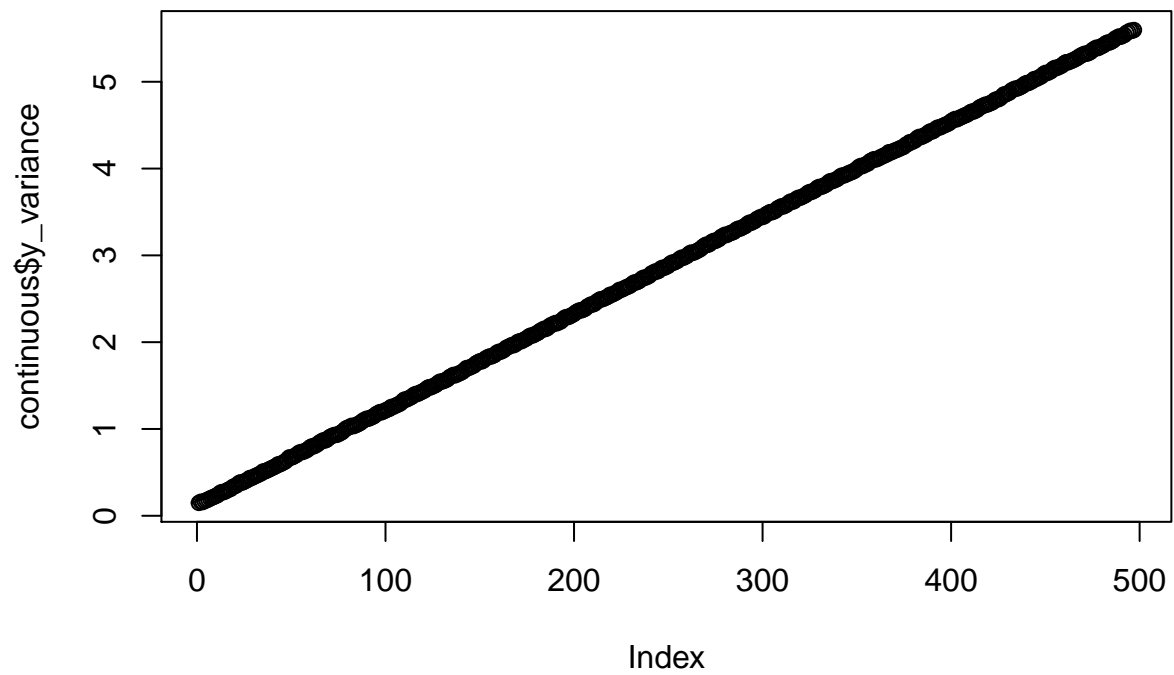# Continuous total distance error over time
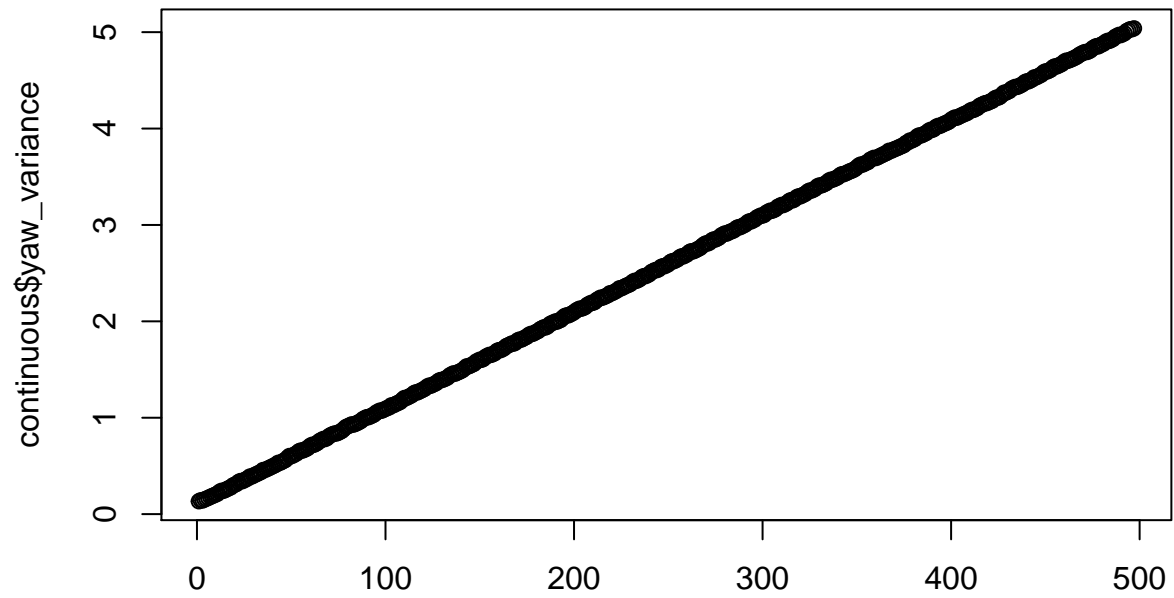

Discrete total distance error over time
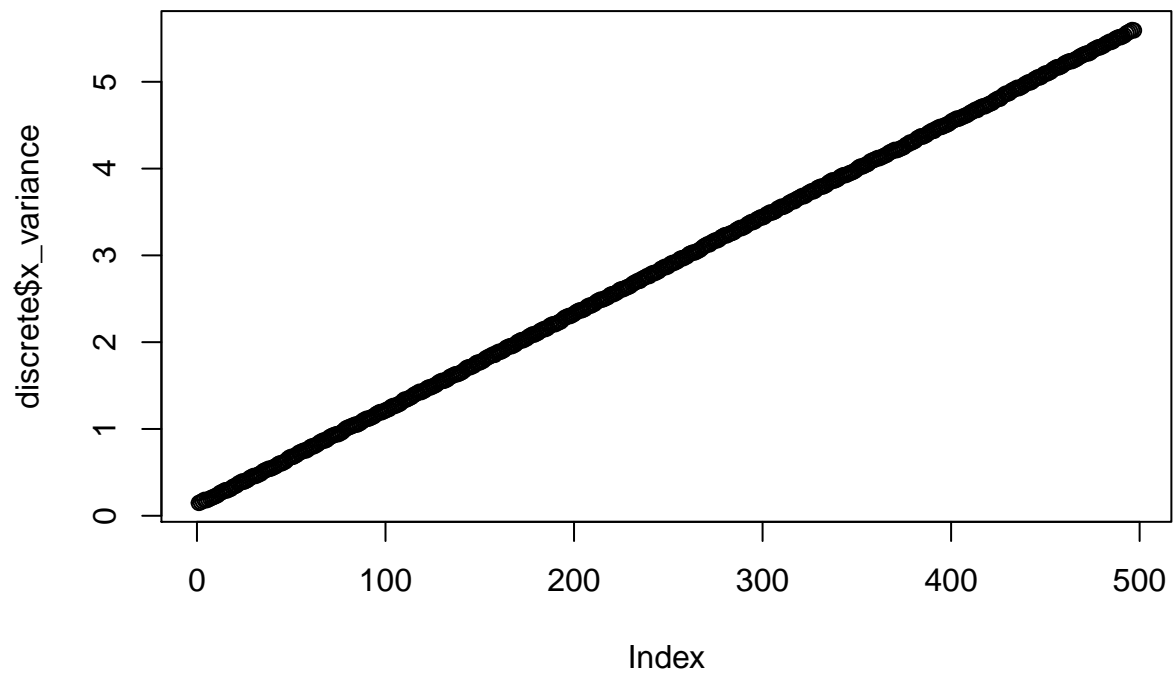
Continuous Filter X Variance Over Time
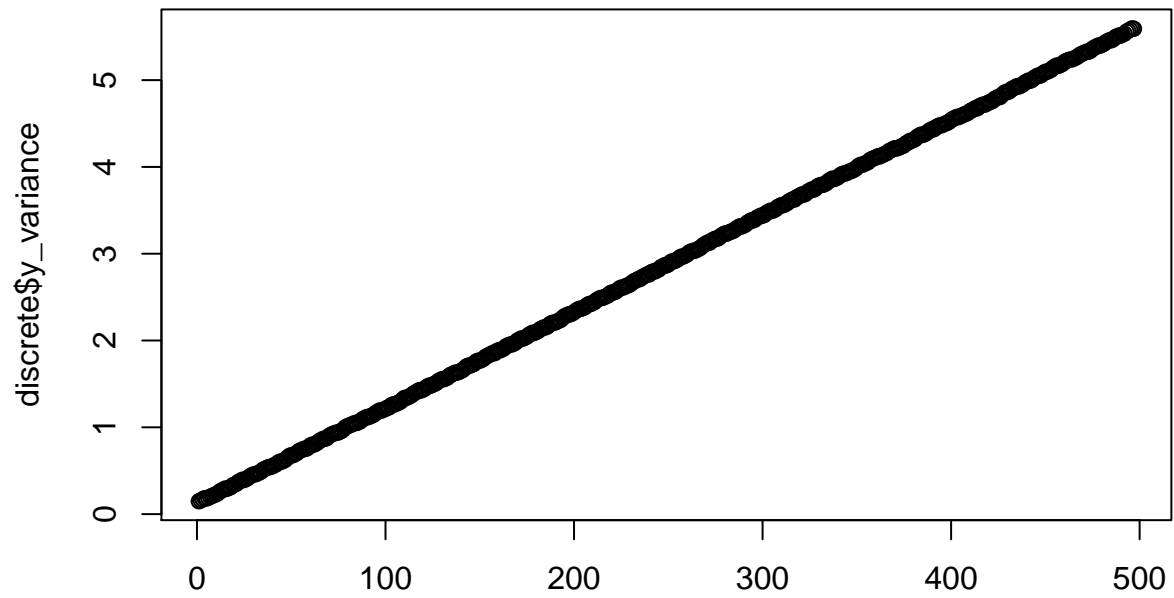

Continuous Filter Y Variance Over Time
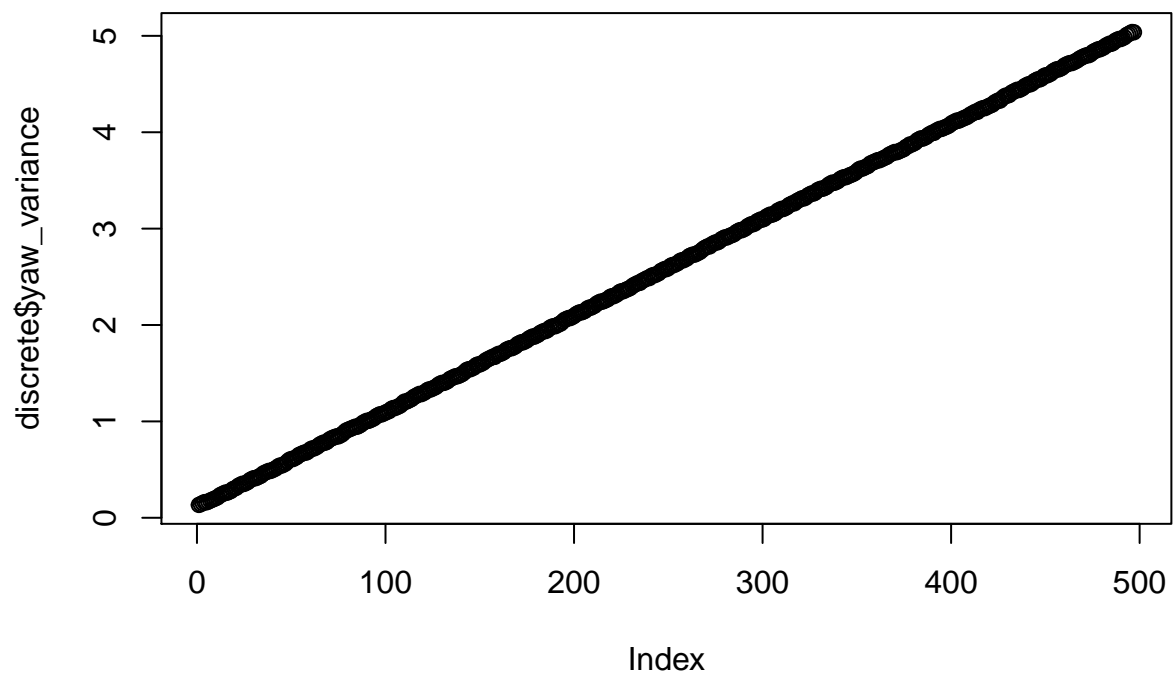
Continuous Filter Yaw Variance Over Time
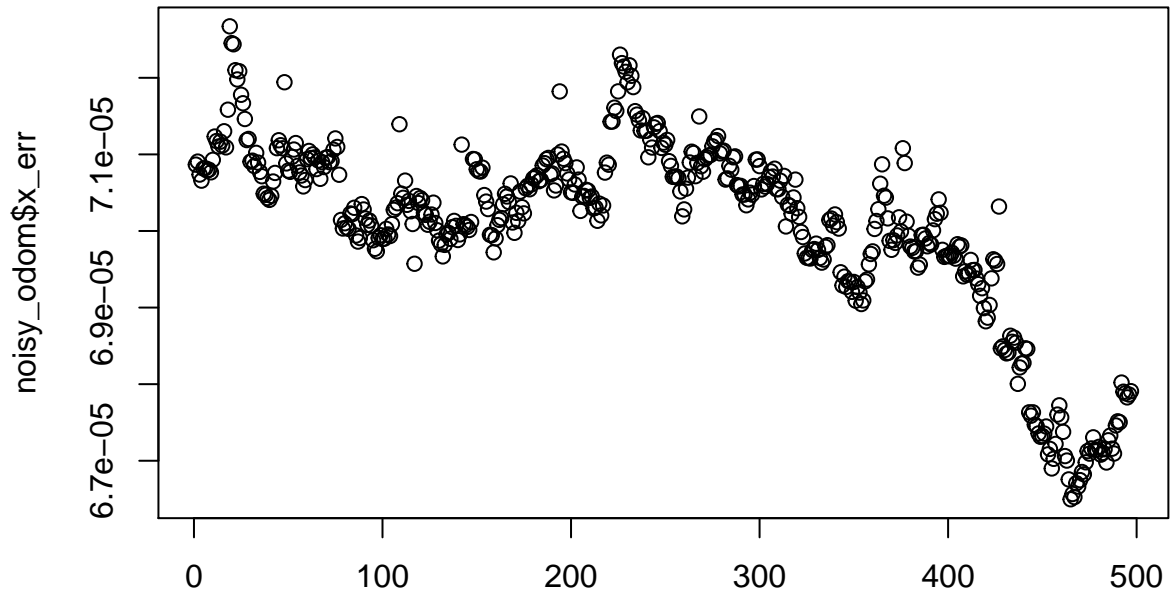

Discrete Filter X Variance Over Time
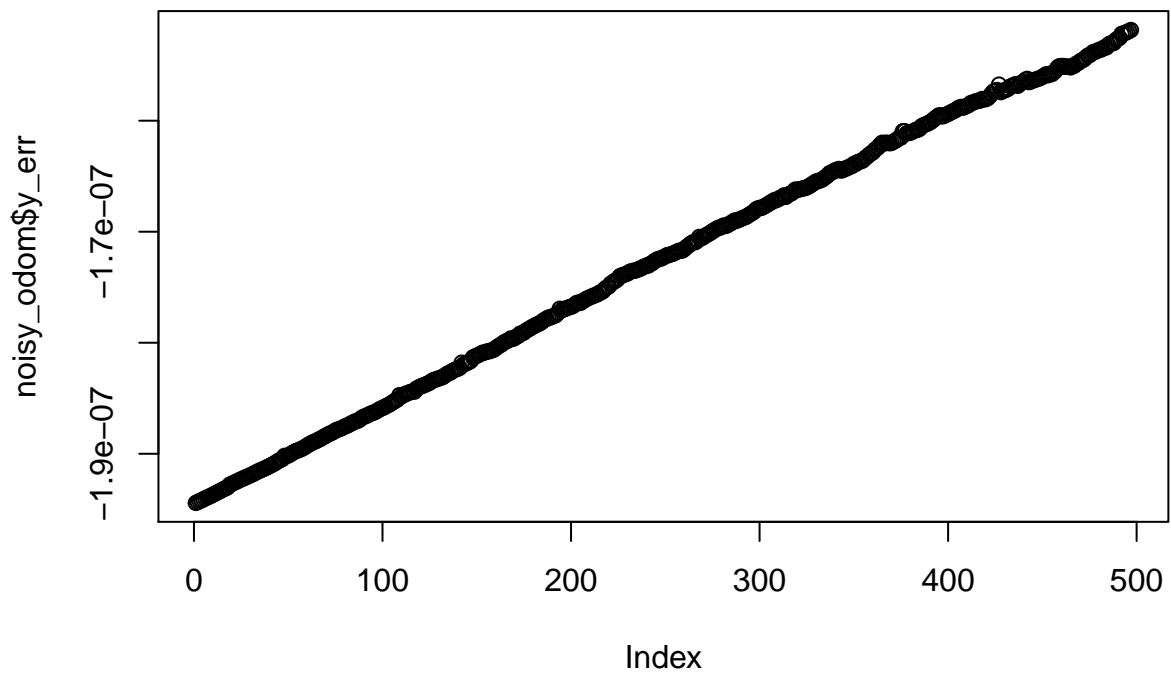
Discrete Filter Y Variance Over Time

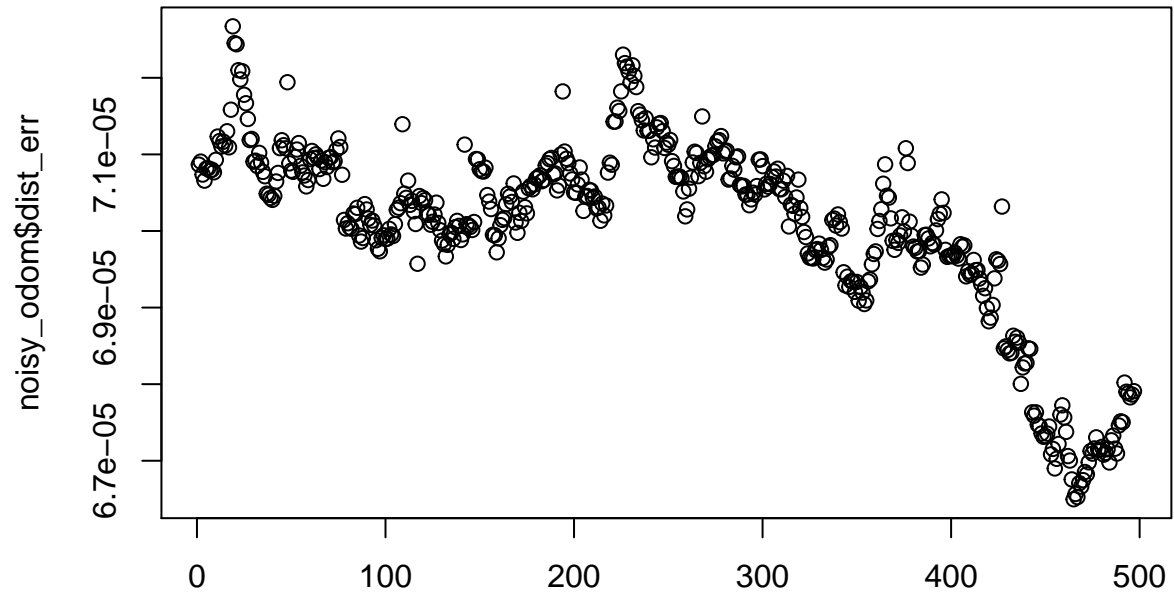**Discrete Filter Yaw Variance Over Time**
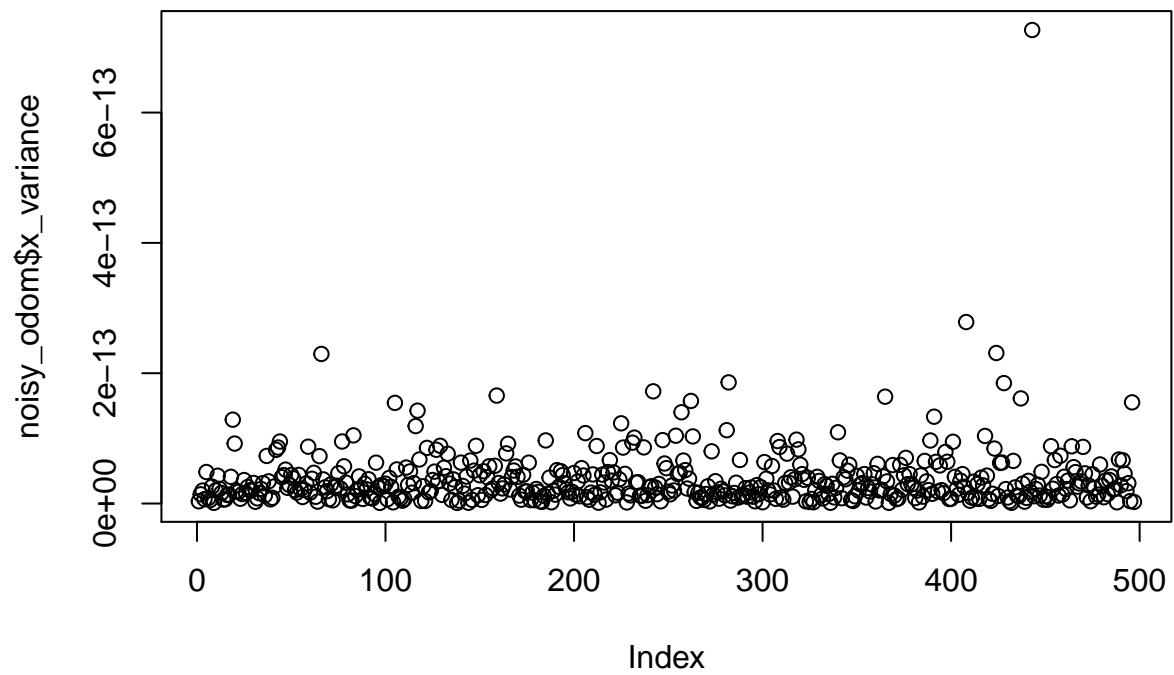
Noisy Odom X Error Over Time
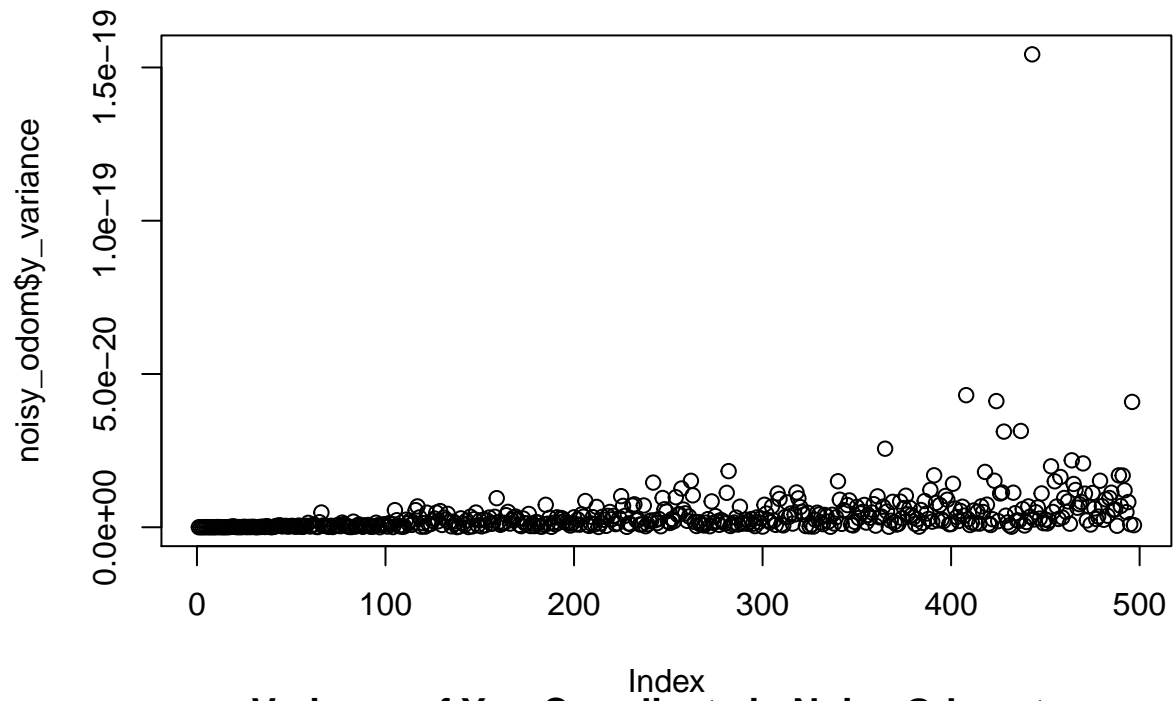

Noisy Odom Y Error Over Time

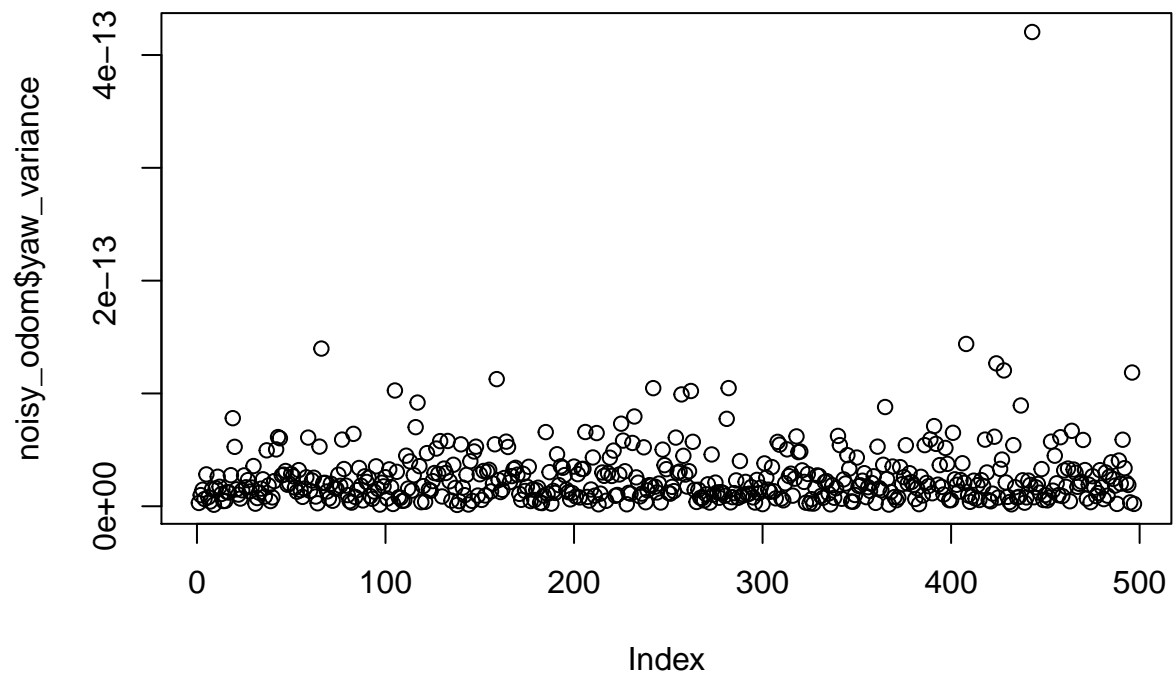**Noisy Odom Horizontal Distance Error Over Time**

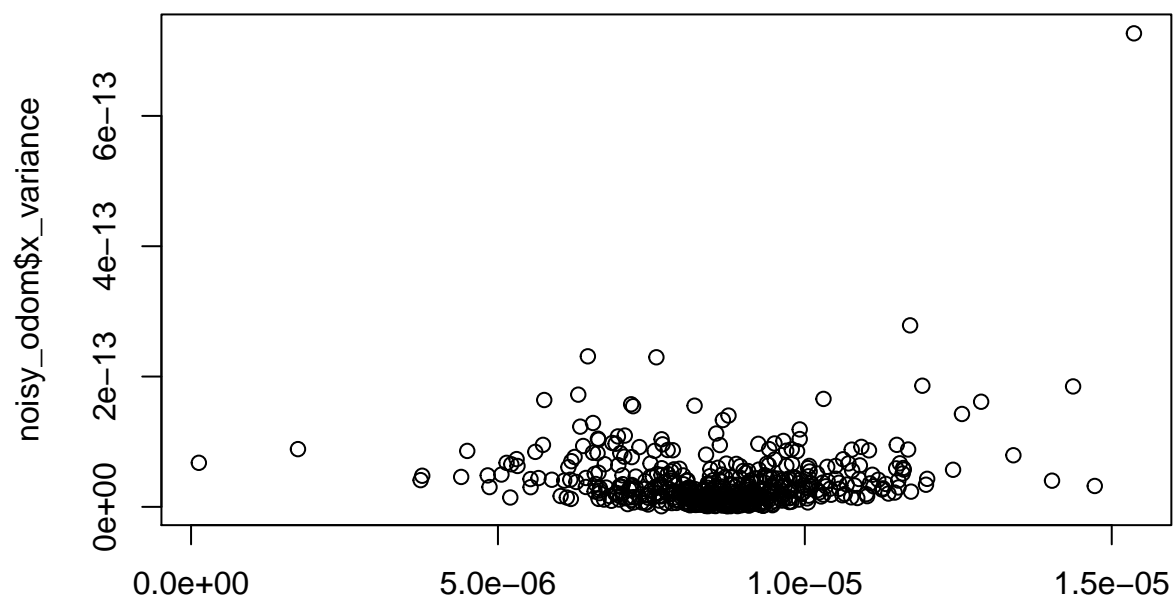**Variance of X Coordinate in Noisy Odometry**

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