

one_stationary_no_gps Turtlebot 1 Report

Matthew Swartwout

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

The runtime of this experiment was 0 hours, 0 minutes, and 47.5 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.
## -5.599e-07  1.388e-06  2.047e-06  2.096e-06  2.726e-06  5.166e-06
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
##  9.879e-10  1.100e-08  2.044e-08  1.959e-08  2.852e-08  3.432e-08
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
##  1.778e-05  5.687e-05  6.940e-05  6.714e-05  7.982e-05  1.006e-04
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
##  3.162e-08  1.388e-06  2.047e-06  2.102e-06  2.726e-06  5.166e-06
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
## -3.396e-06 -1.208e-06 -2.111e-07  6.641e-08  1.288e-06  4.056e-06
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
##  9.875e-10  1.221e-08  2.333e-08  2.403e-08  3.546e-08  4.979e-08
```

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

```
##      Min.    1st Qu.    Median      Mean    3rd Qu.      Max.
##  7.008e-05  9.084e-05  9.681e-05  9.967e-05  1.078e-04  1.366e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 2.002e-08 6.478e-07 1.246e-06 1.332e-06 1.888e-06 4.056e-06
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.005e-05 1.148e-05 1.214e-05 1.236e-05 1.312e-05 1.549e-05
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -9.933e-09 -9.459e-09 -9.305e-09 -9.188e-09 -8.909e-09 -8.369e-09
```

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

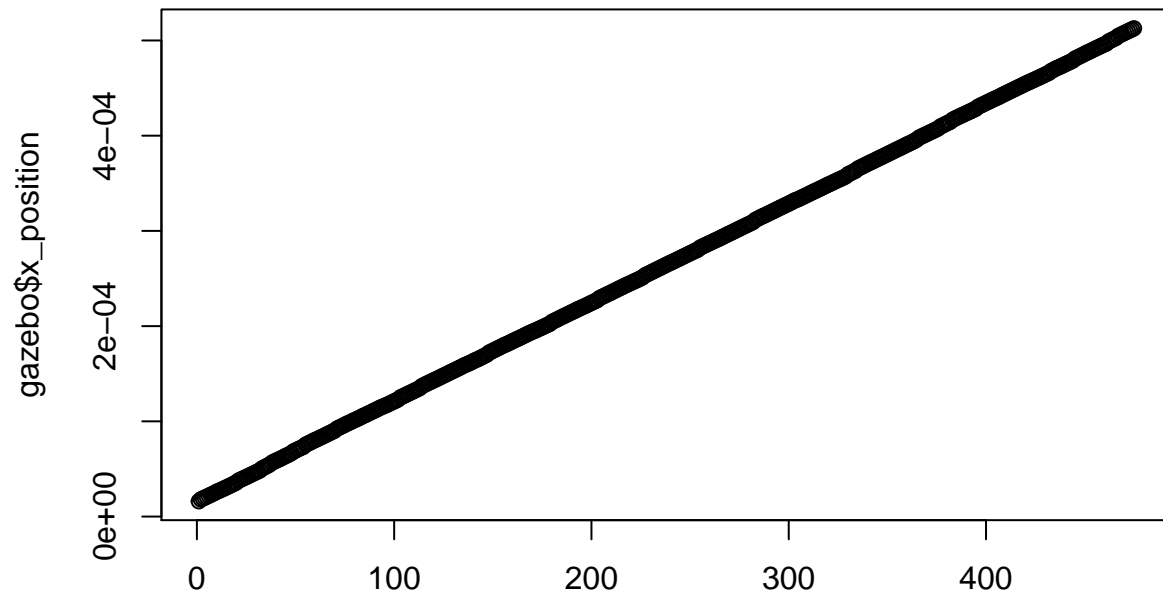
```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.005e-05 1.148e-05 1.214e-05 1.236e-05 1.312e-05 1.549e-05
```

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

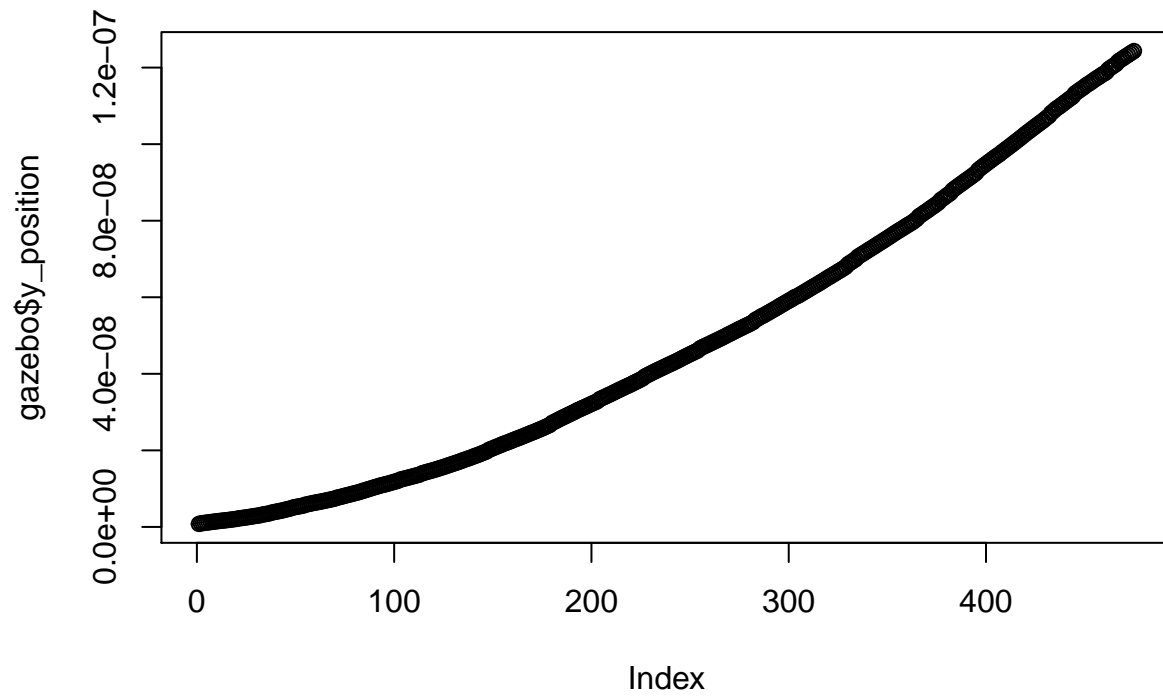
if (NROW(noisy_odom) > 0) {
  summary(noisy_odom$x_variance)
  summary(noisy_odom$y_variance)
  summary(noisy_odom$yaw_variance)
}
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.218e-15 8.660e-15 1.763e-14 2.351e-14 3.314e-14 1.642e-13
```

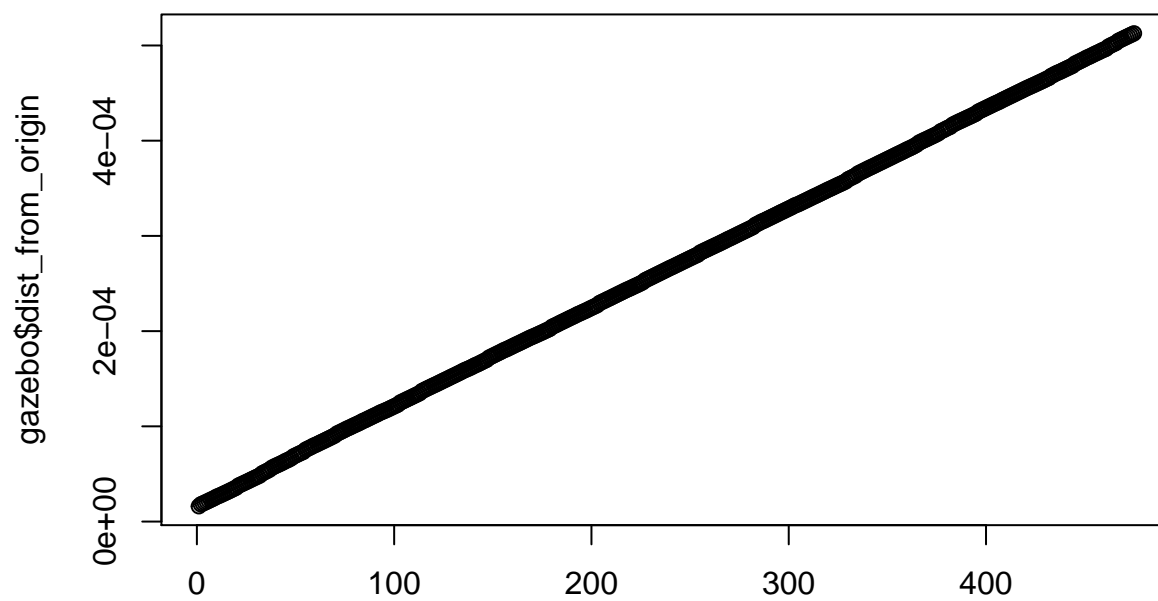
X coordinate of robot over time



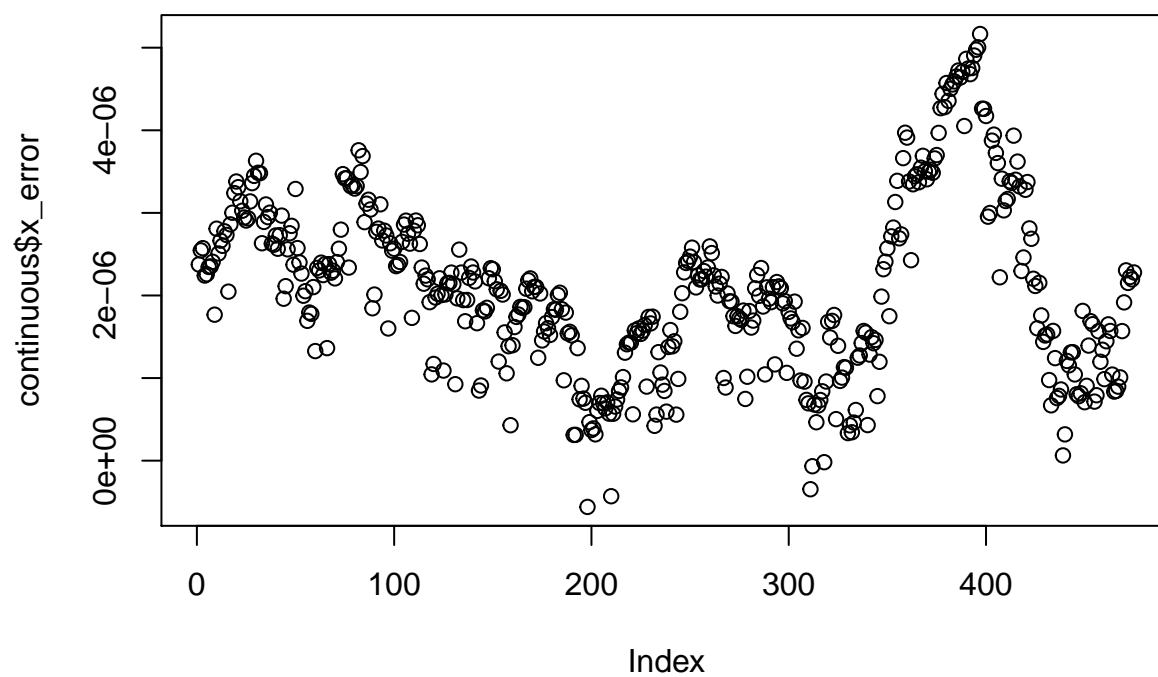
Y coordinate of robot over time



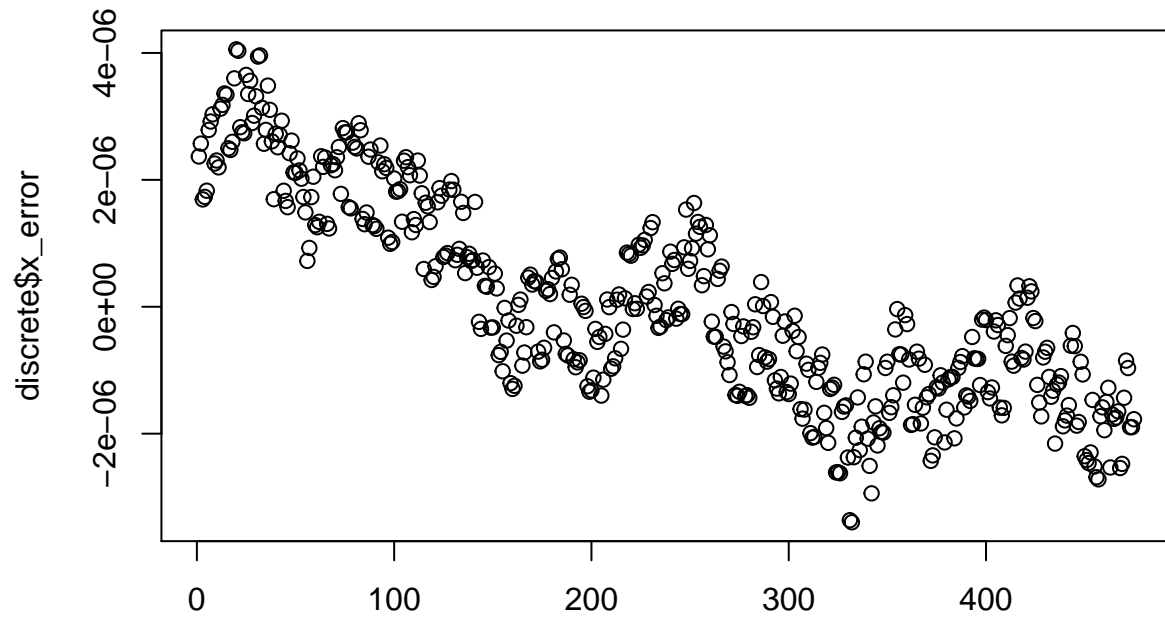
Distance from origin vs. time



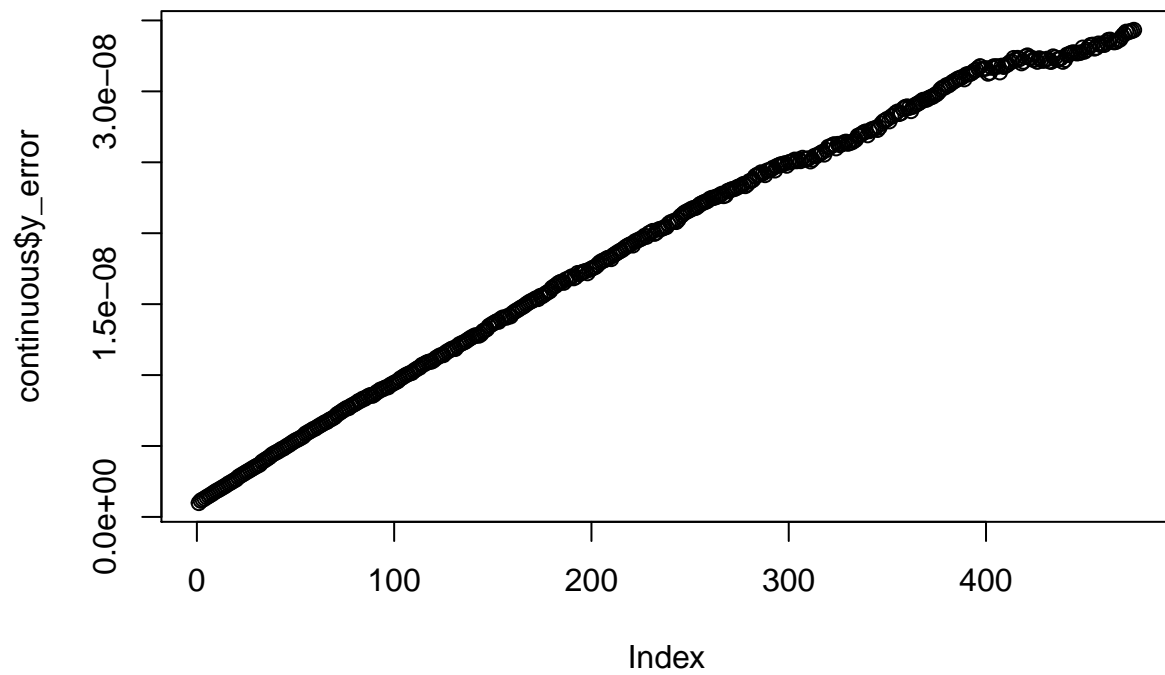
Continuous x_error over time



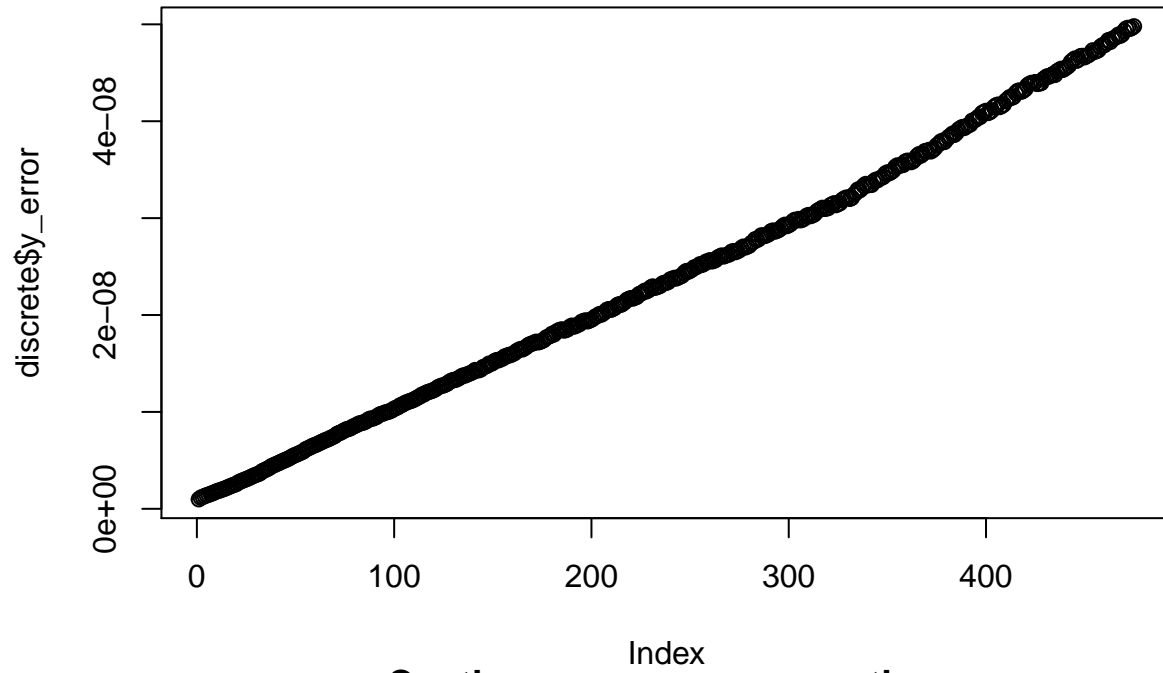
Discrete x_error over time



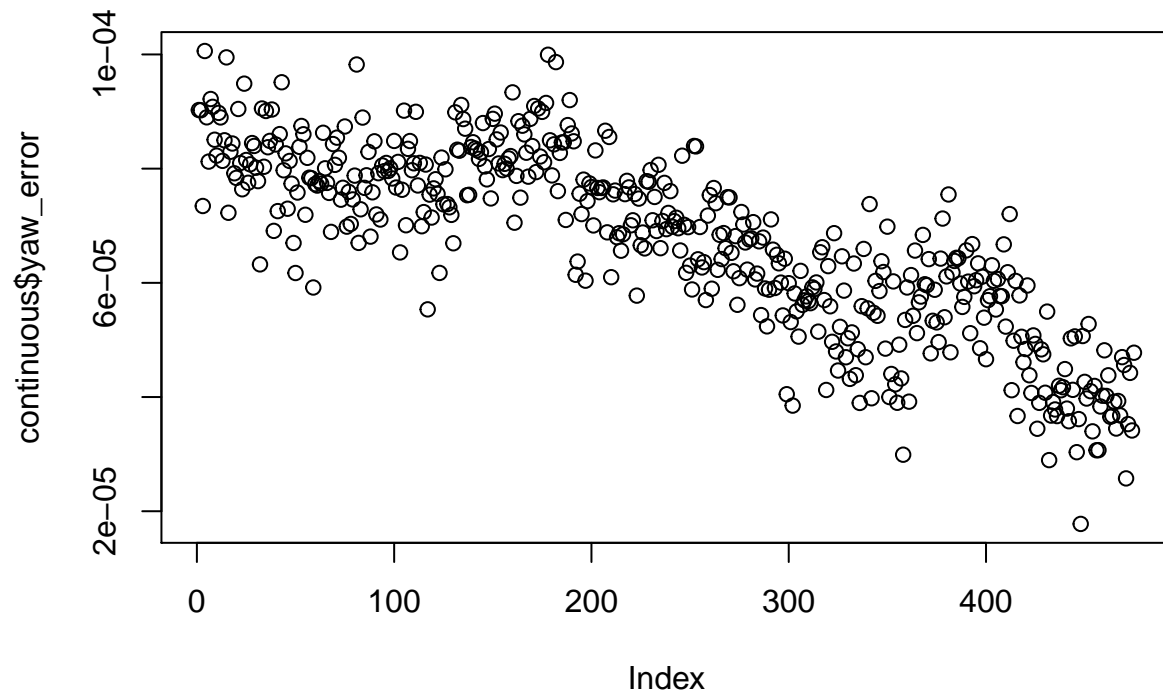
Continuous y_error over time



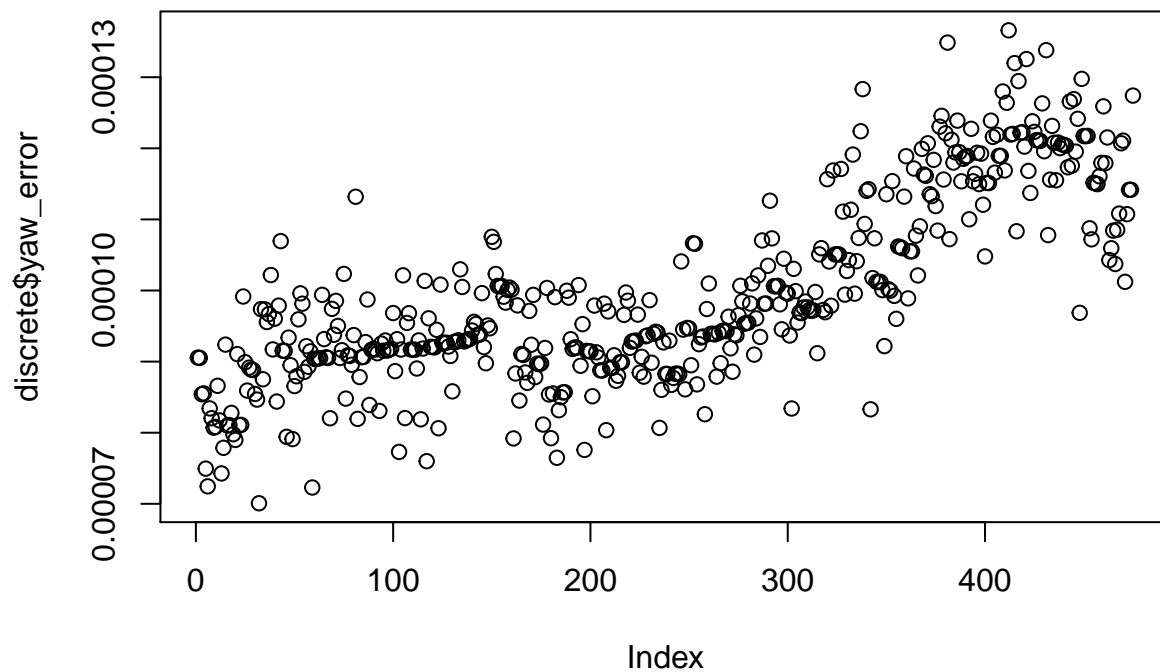
Discrete y_error over time



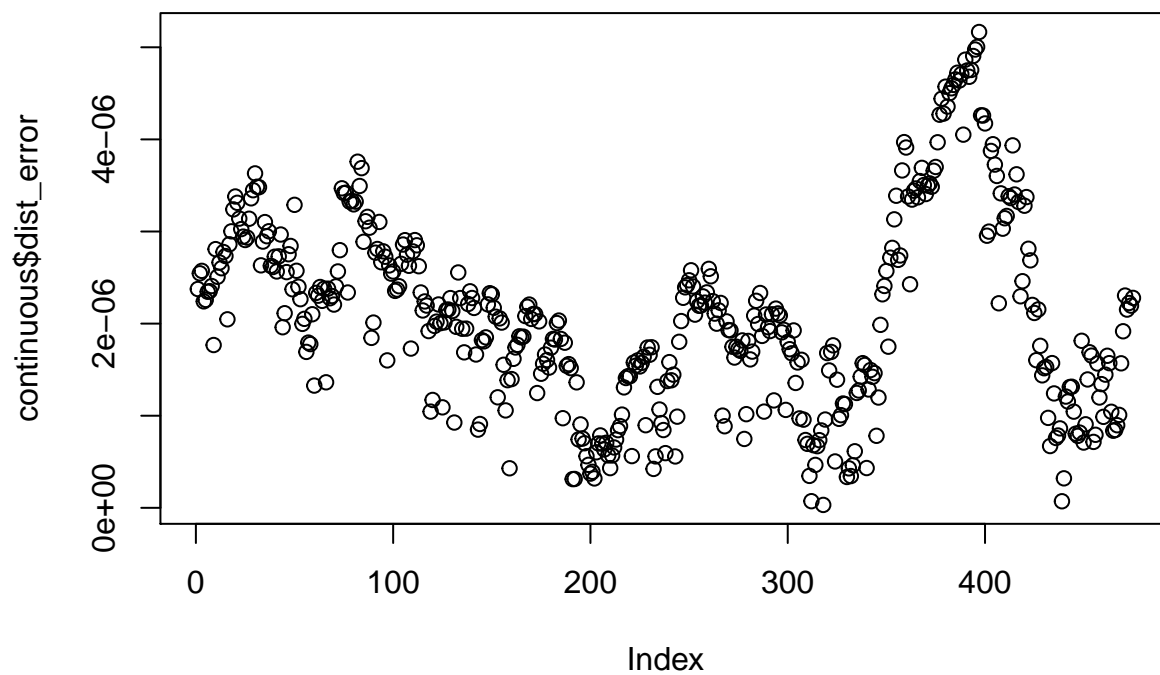
Continuous yaw error over time



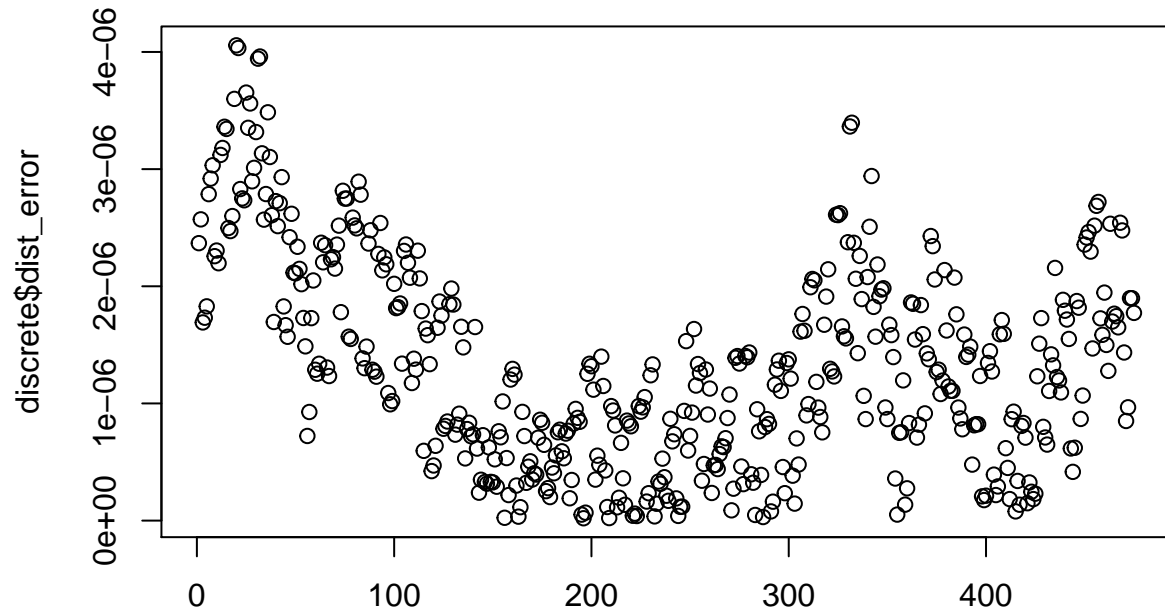
Discrete yaw error over time



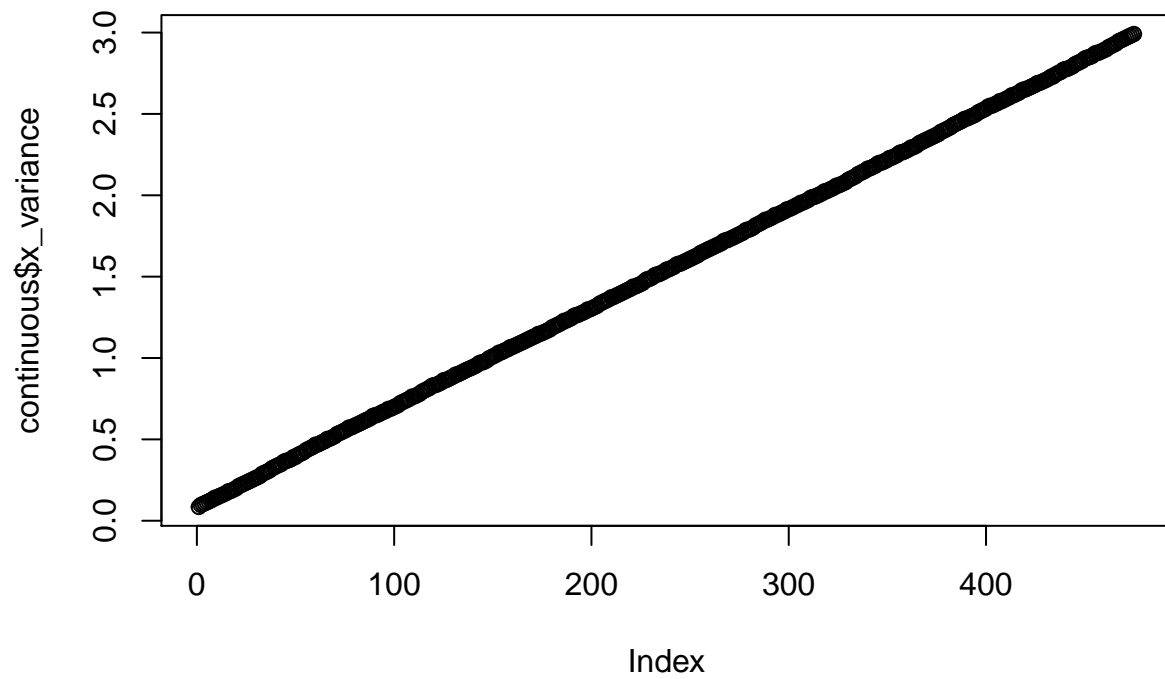
Continuous total distance error over time



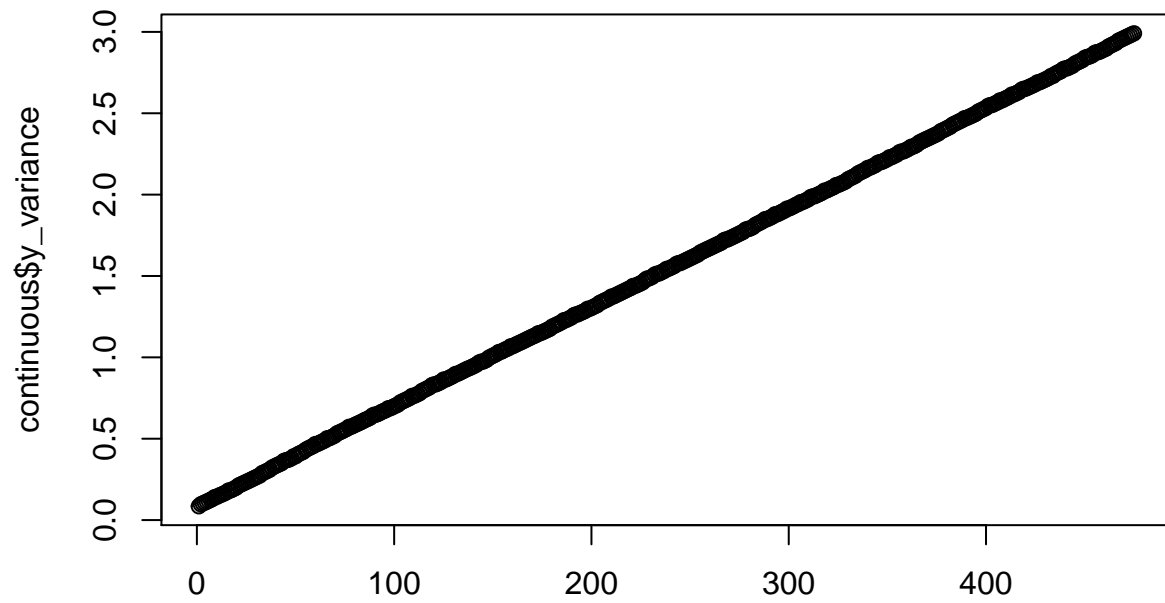
Discrete total distance error over time



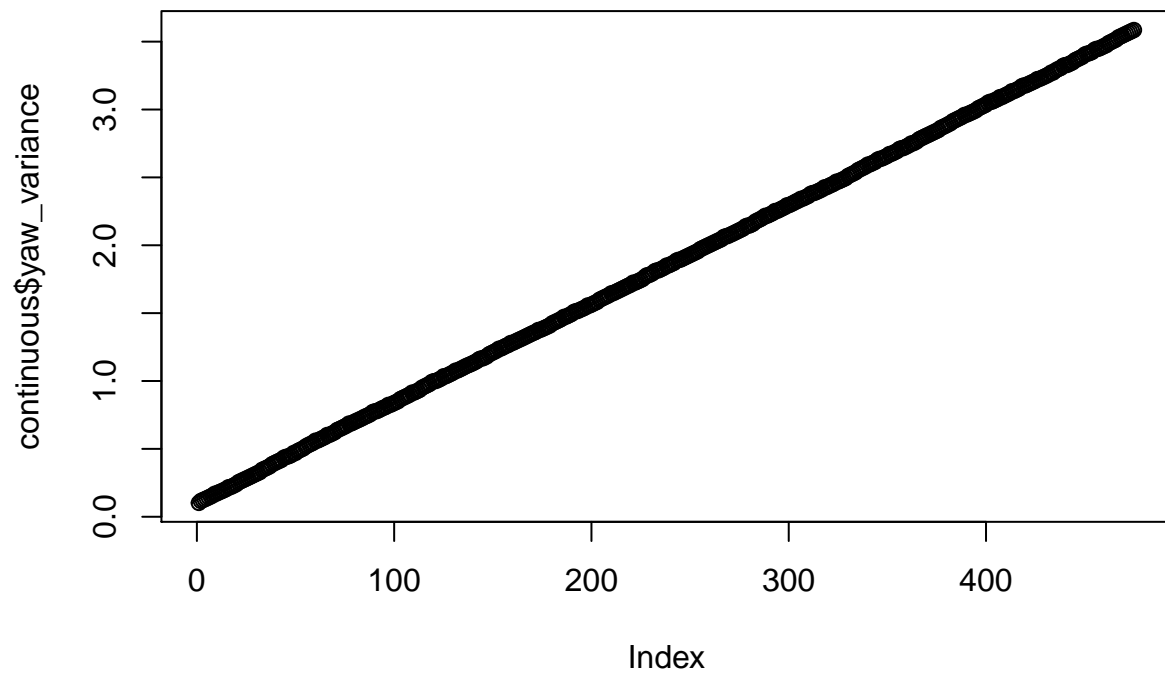
Continuous Filter X Variance Over Time



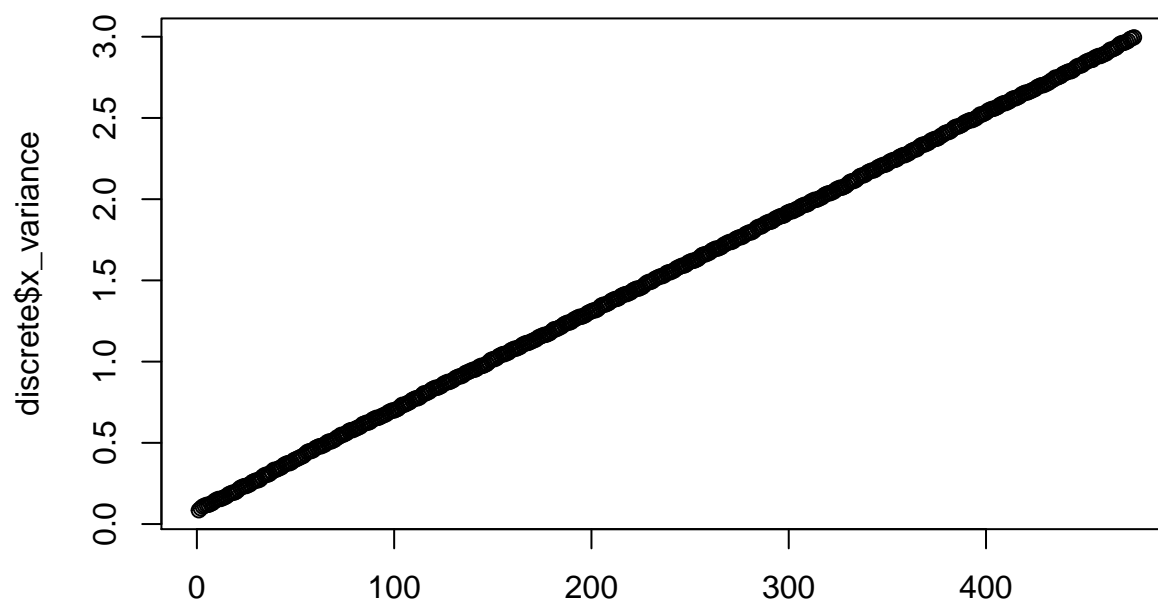
Continuous Filter Y Variance Over Time



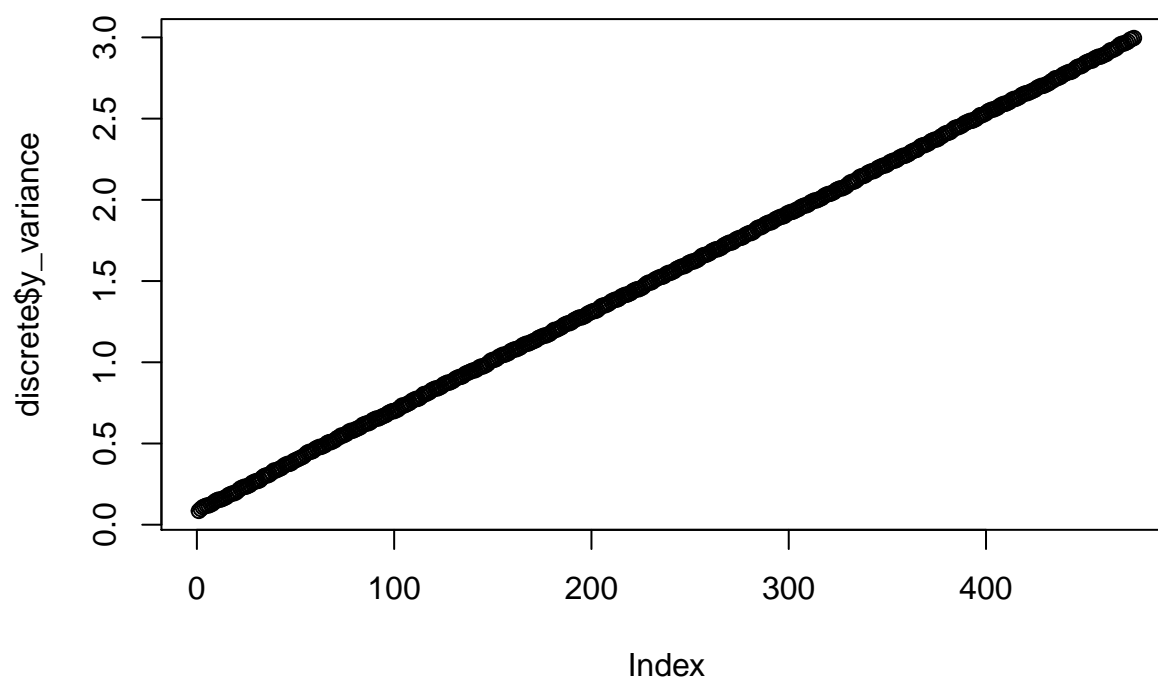
Continuous Filter Yaw Variance Over Time



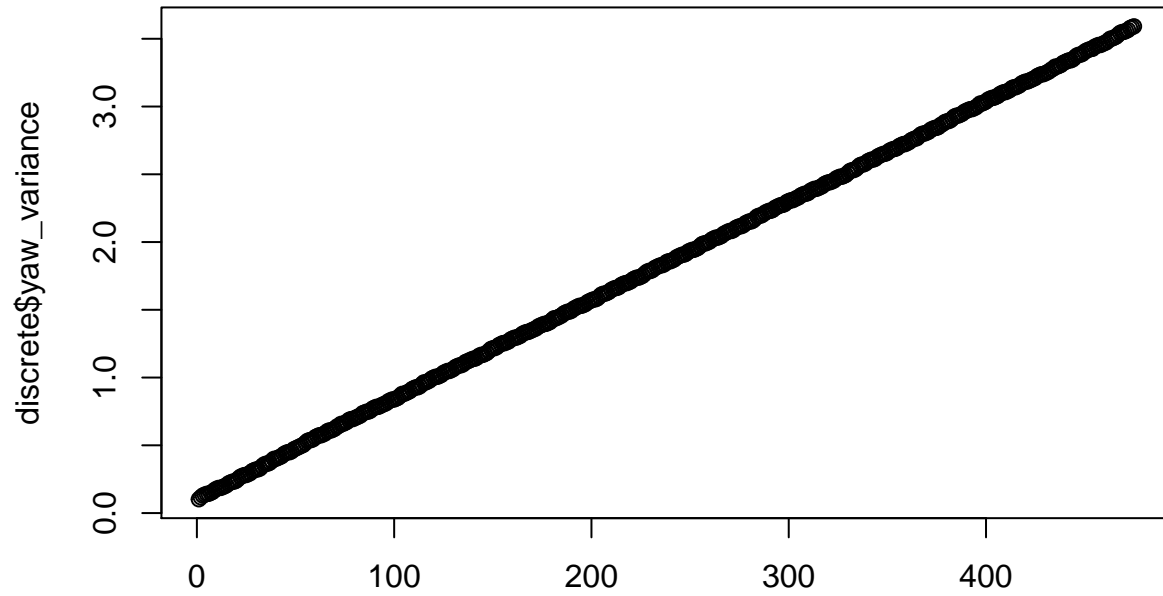
Discrete Filter X Variance Over Time



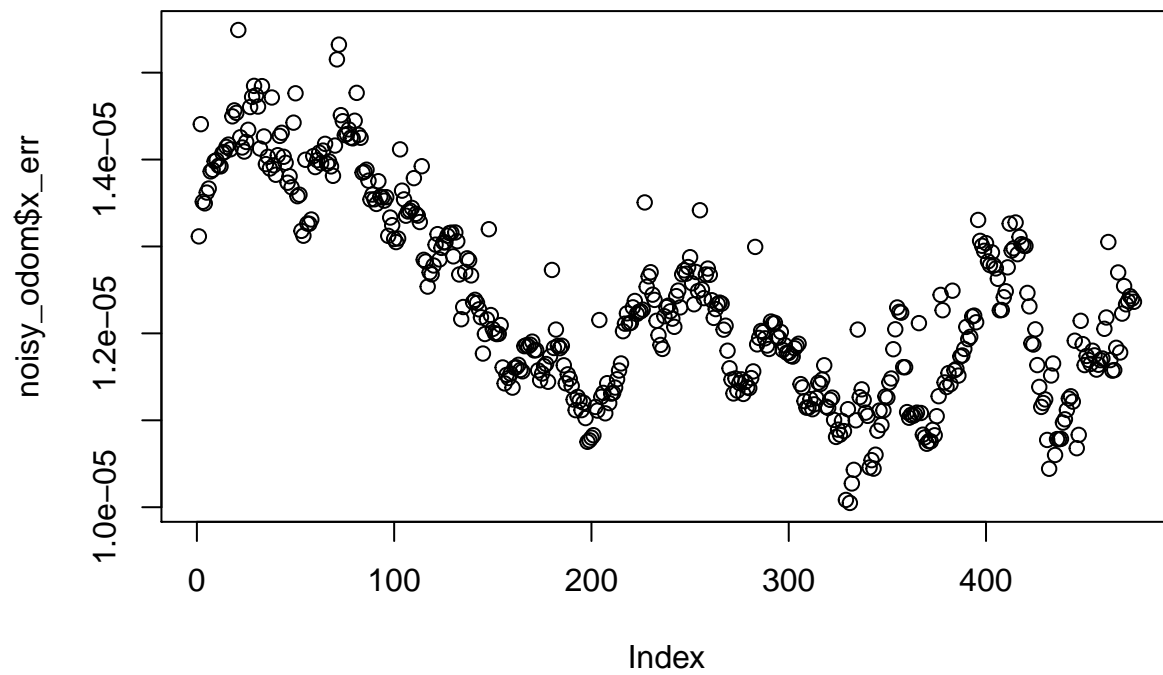
Discrete Filter Y Variance Over Time



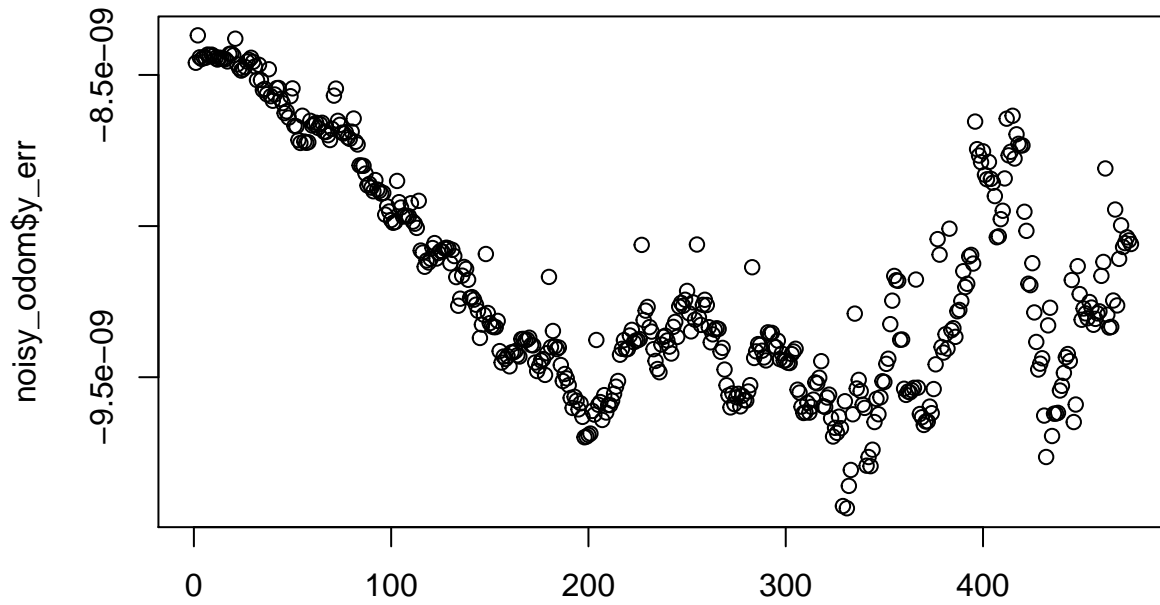
Discrete Filter Yaw Variance Over Time



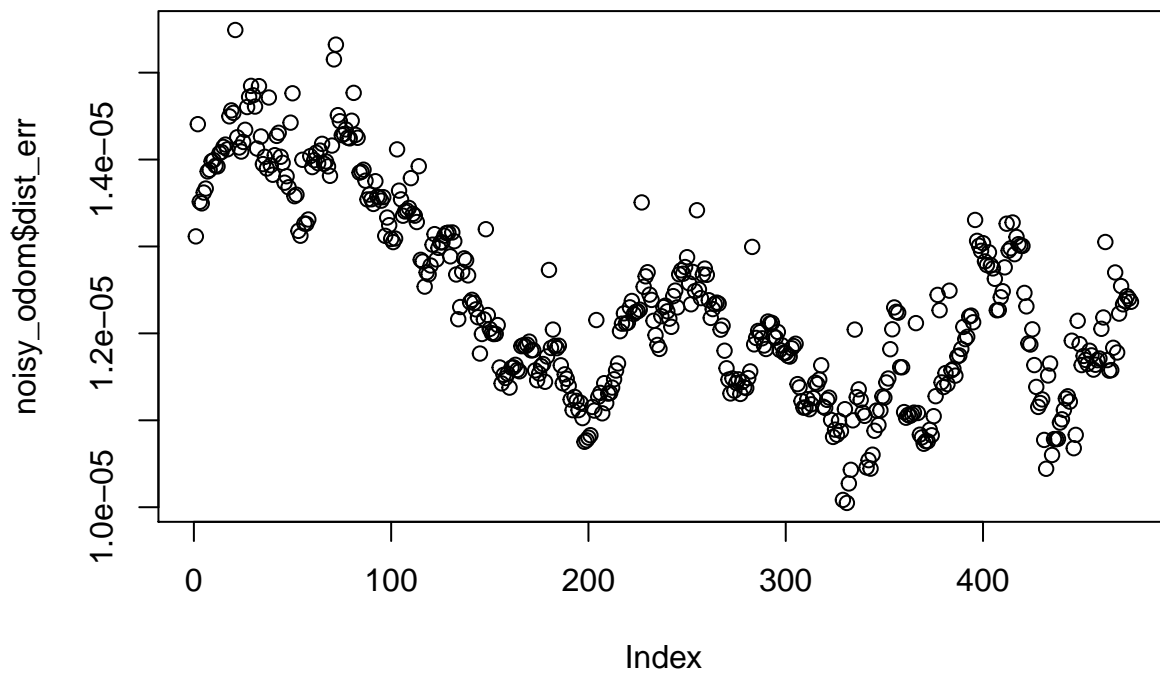
Noisy Odom X Error Over Time



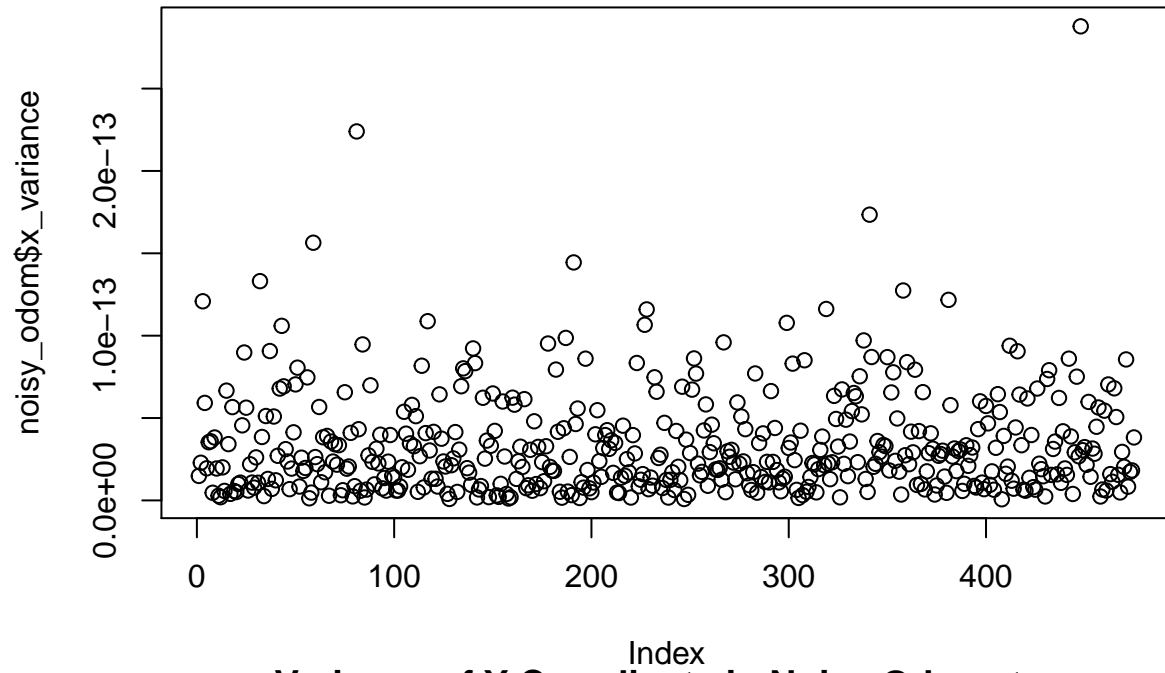
Noisy Odom Y Error Over Time



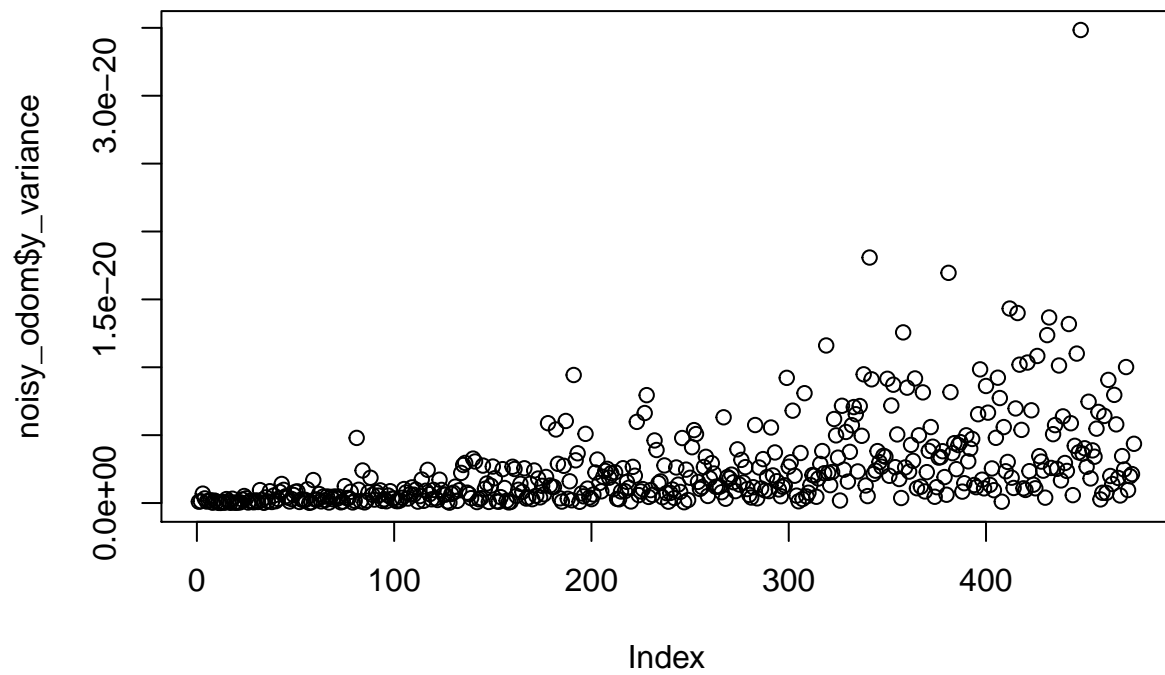
Noisy Odom Horizontal Distance Error Over Time



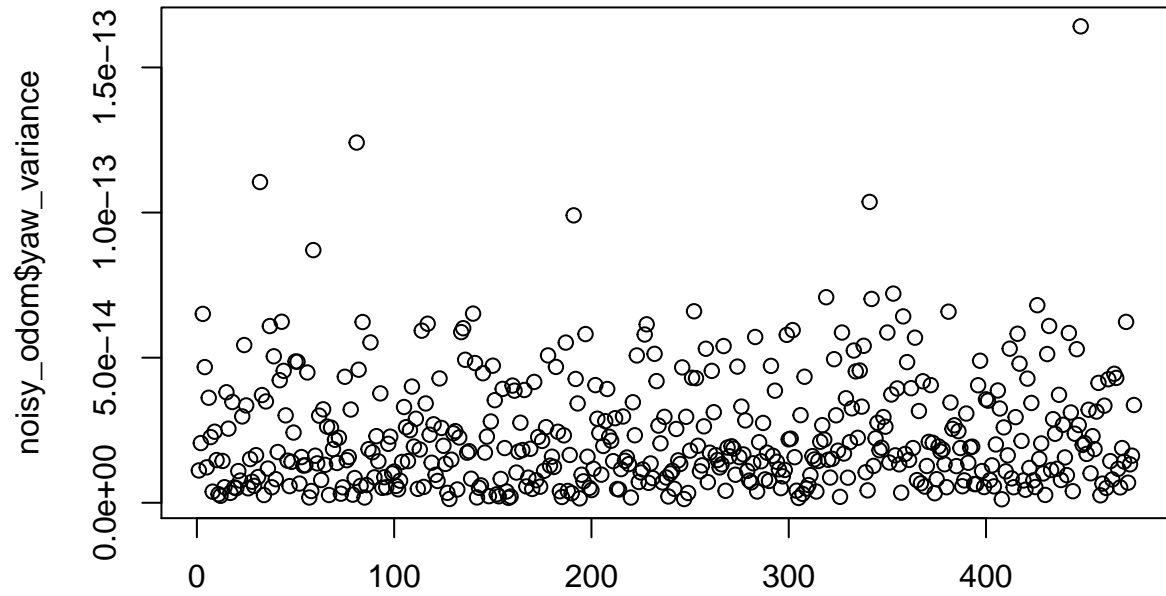
Variance of X Coordinate in Noisy Odometry



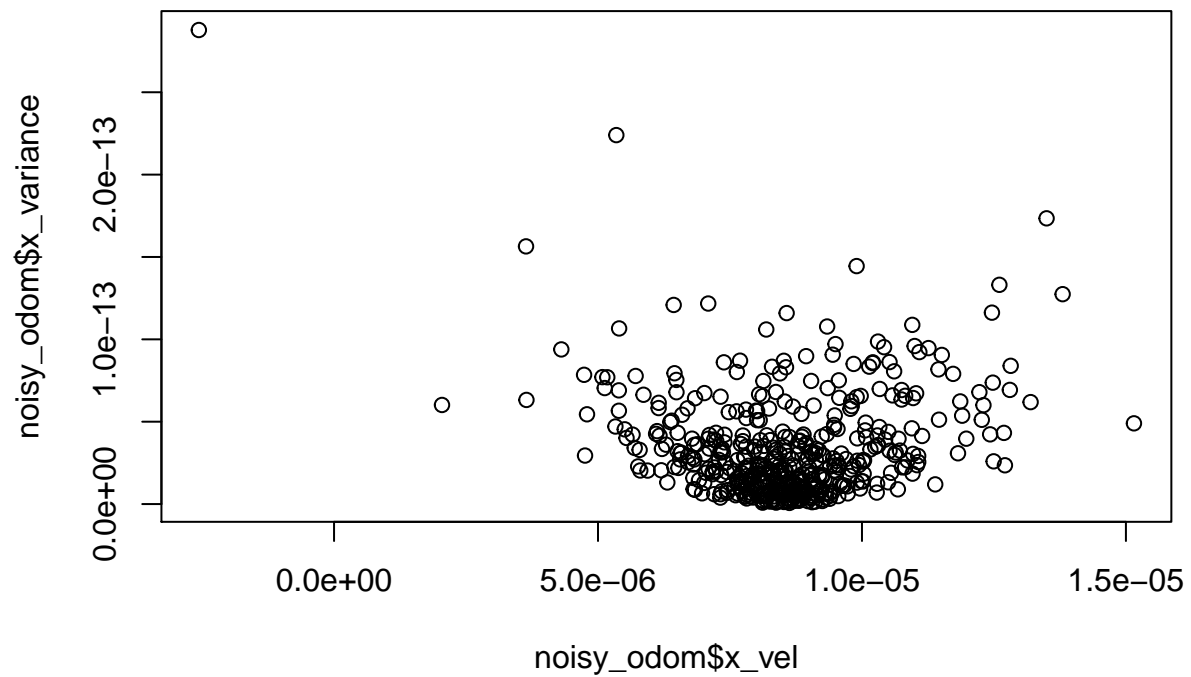
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

