

two_stationary_noiseless_no_gps Turtlebot 1 Report

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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 48.4 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.
## 1.477e-05 1.388e-04 2.613e-04 2.626e-04 3.875e-04 5.118e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 5.363e-10 1.267e-08 4.105e-08 4.861e-08 8.085e-08 1.258e-07
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 2.725e-05 1.579e-04 2.906e-04 2.513e-04 3.336e-04 4.040e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.477e-05 1.388e-04 2.613e-04 2.626e-04 3.875e-04 5.118e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.477e-05 1.388e-04 2.613e-04 2.626e-04 3.875e-04 5.118e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 5.363e-10 1.267e-08 4.105e-08 4.861e-08 8.085e-08 1.258e-07
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 2.725e-05 1.579e-04 2.906e-04 2.513e-04 3.336e-04 4.040e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.477e-05 1.388e-04 2.613e-04 2.626e-04 3.875e-04 5.118e-04
```

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

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## 1.662e-05 1.766e-05 1.841e-05 1.880e-05 1.945e-05 2.354e-05
```

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

```
##      Min.    1st Qu.      Median        Mean     3rd Qu.        Max.
## -1.507e-08 -1.428e-08 -1.323e-08 -1.303e-08 -1.193e-08 -1.024e-08
```

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

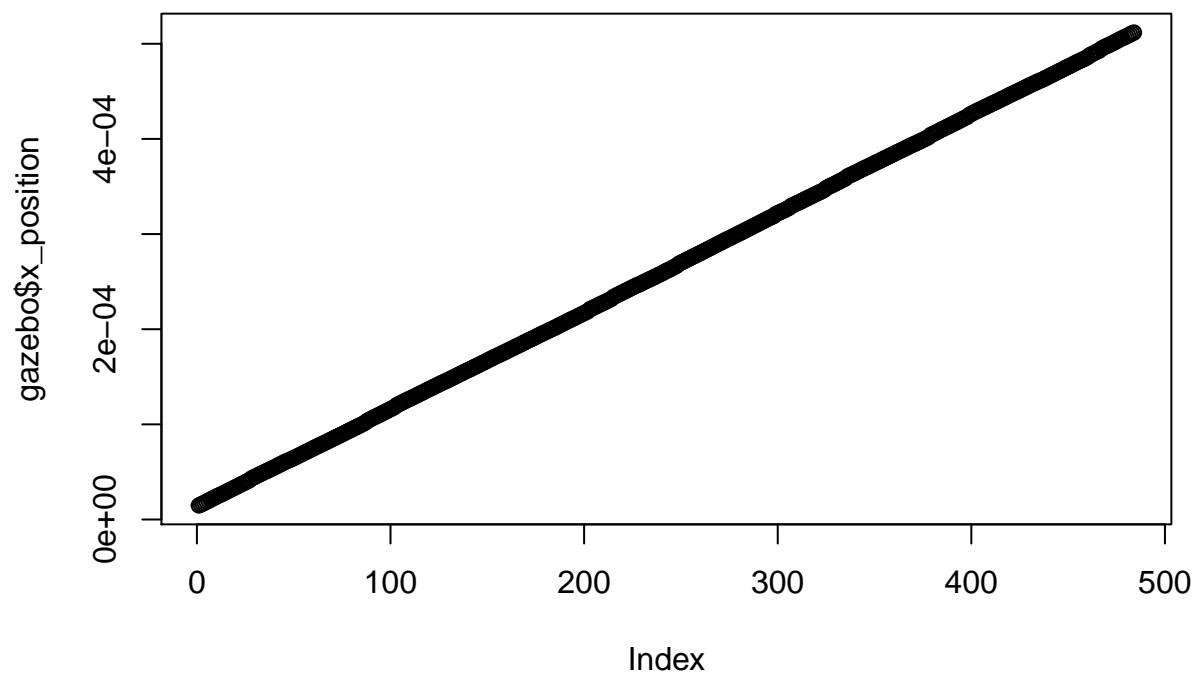
```
##      Min.    1st Qu.      Median        Mean     3rd Qu.        Max.
## 1.662e-05 1.766e-05 1.841e-05 1.880e-05 1.945e-05 2.354e-05
```

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

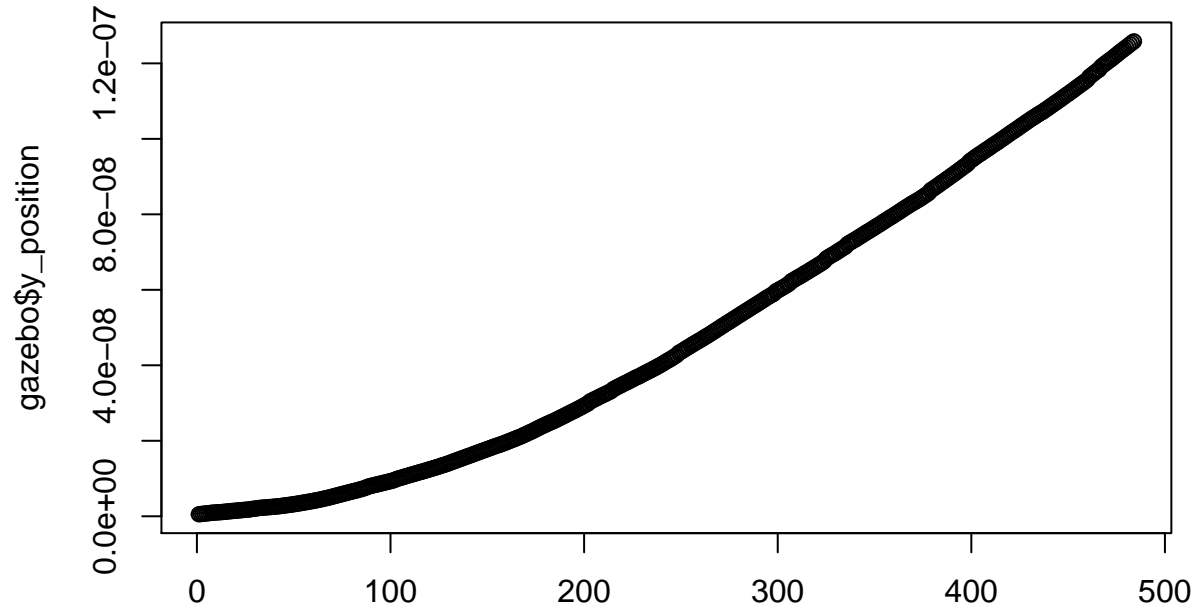
if (NROW(noisy_odom) > 0) {
  summary(noisy_odom$x_variance)
  summary(noisy_odom$y_variance)
  summary(noisy_odom$yaw_variance)
}
```

```
##      Min.    1st Qu.      Median        Mean     3rd Qu.        Max.
## 8.913e-16 9.886e-15 2.005e-14 2.626e-14 3.538e-14 2.324e-13
```

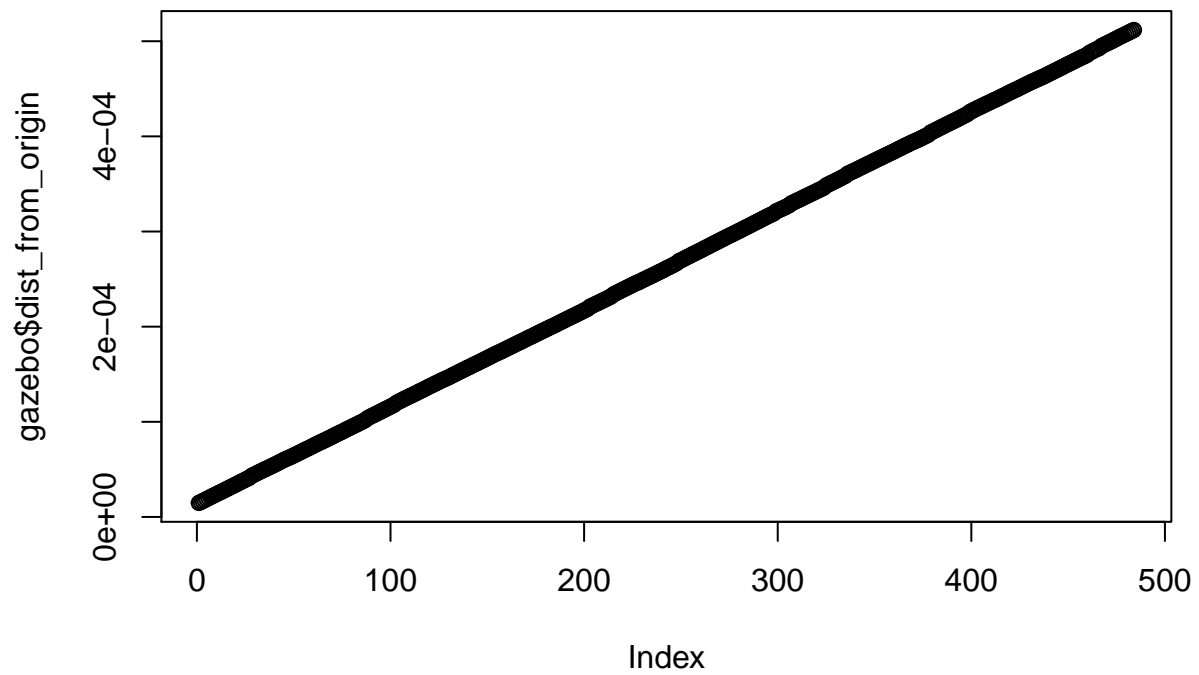
X coordinate of robot over time



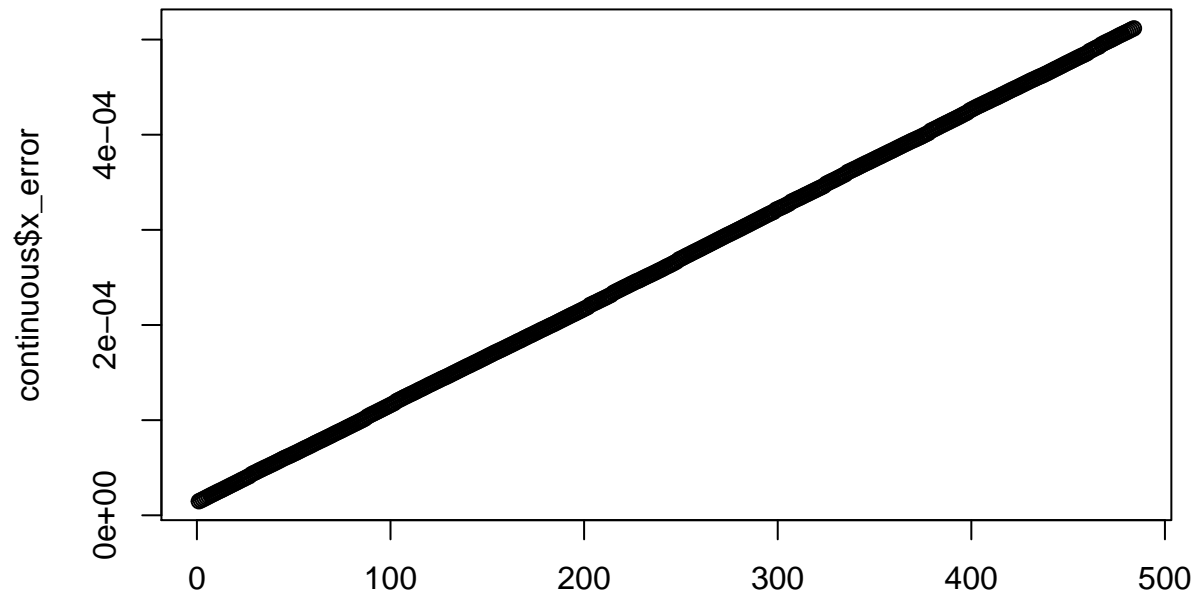
Y coordinate of robot over time



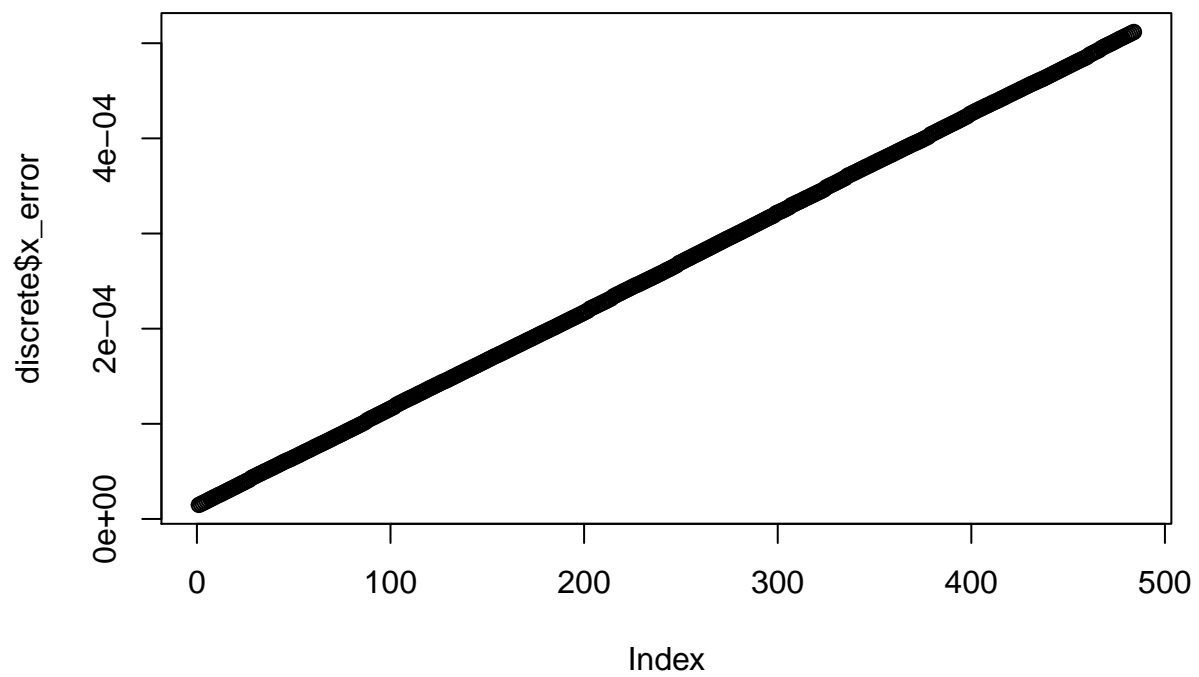
Distance from origin vs. time



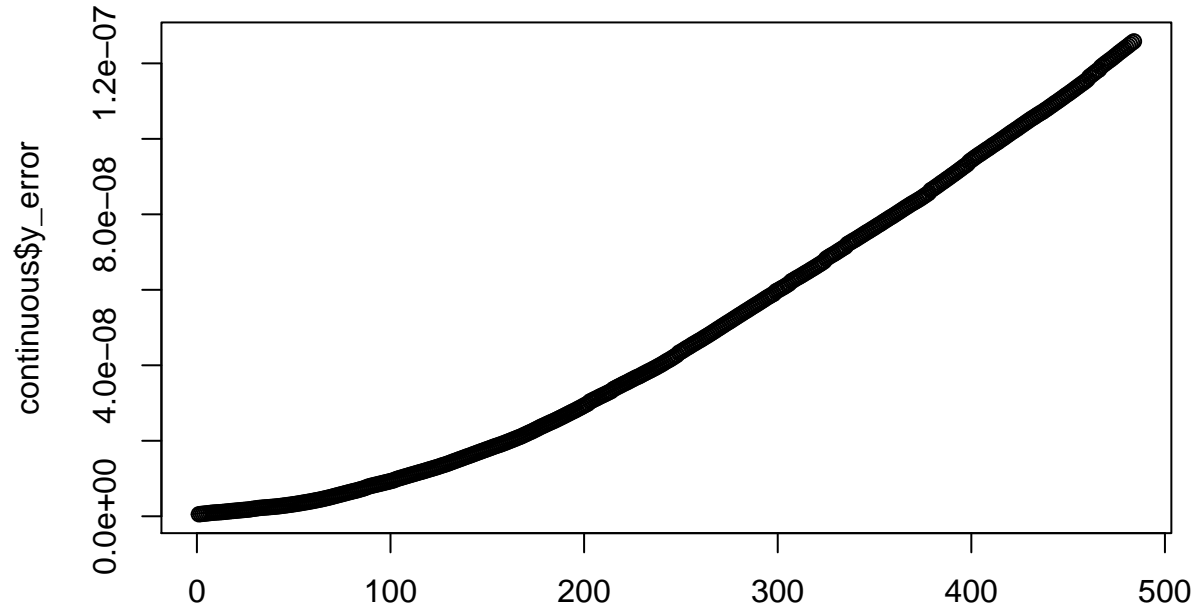
Continuous x_error over time



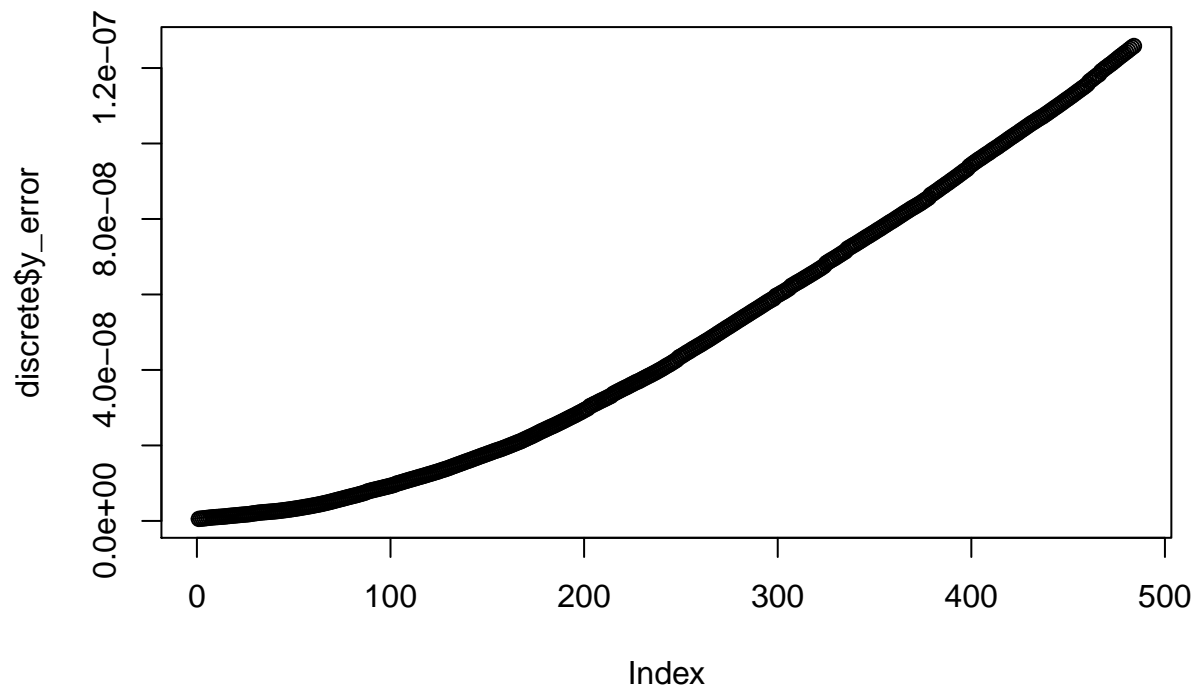
Discrete x_error over time



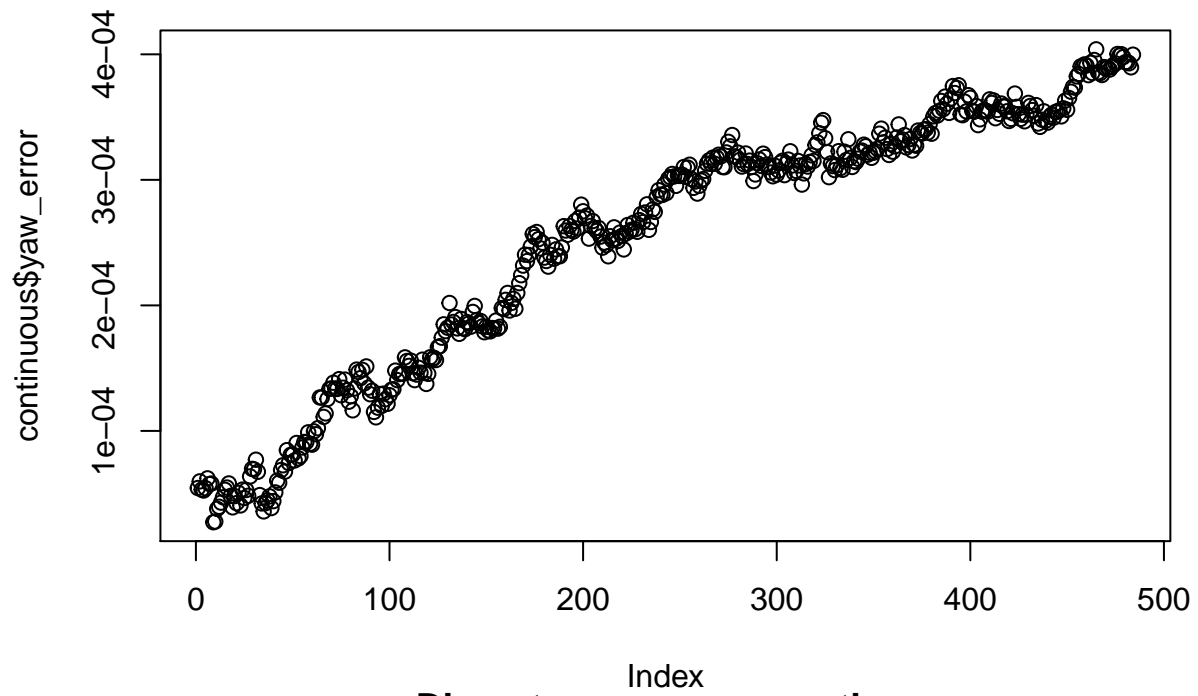
Continuous y_error over time



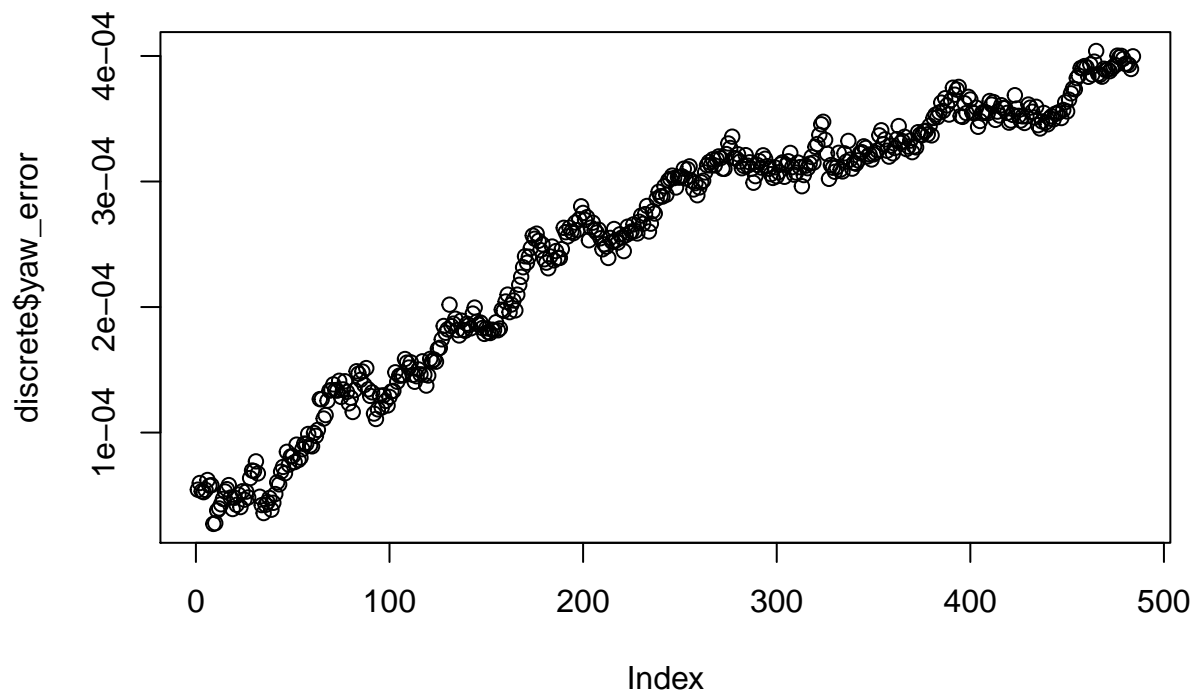
Discrete y_error over time



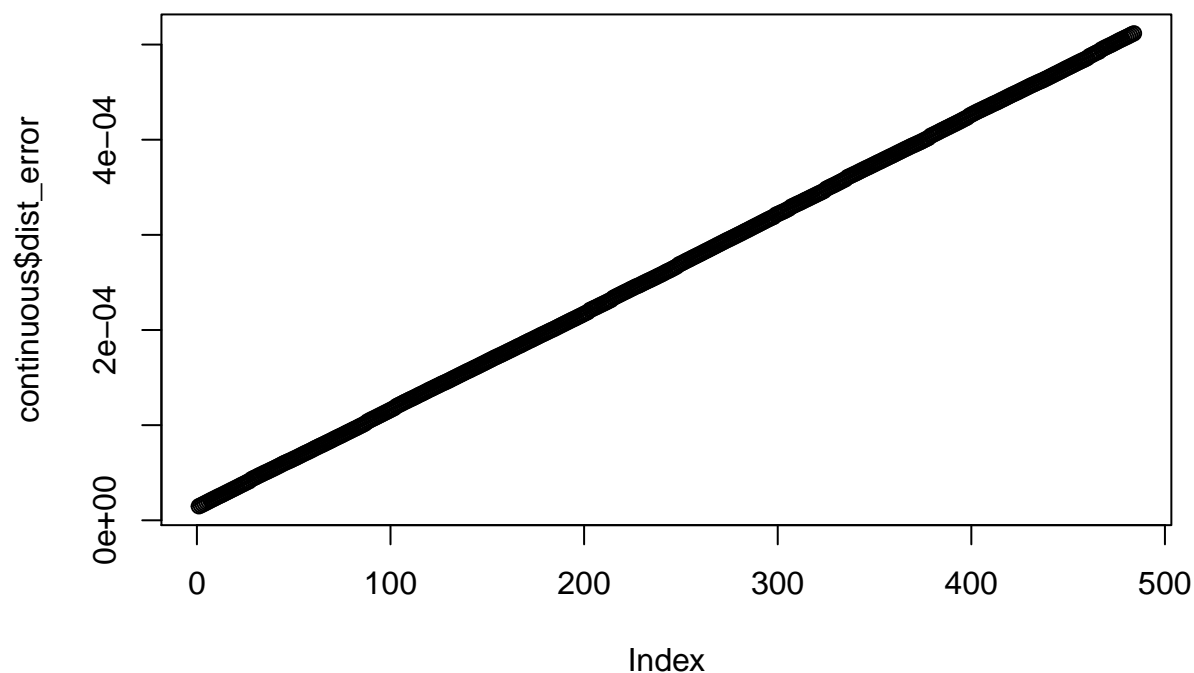
Continuous yaw error over time



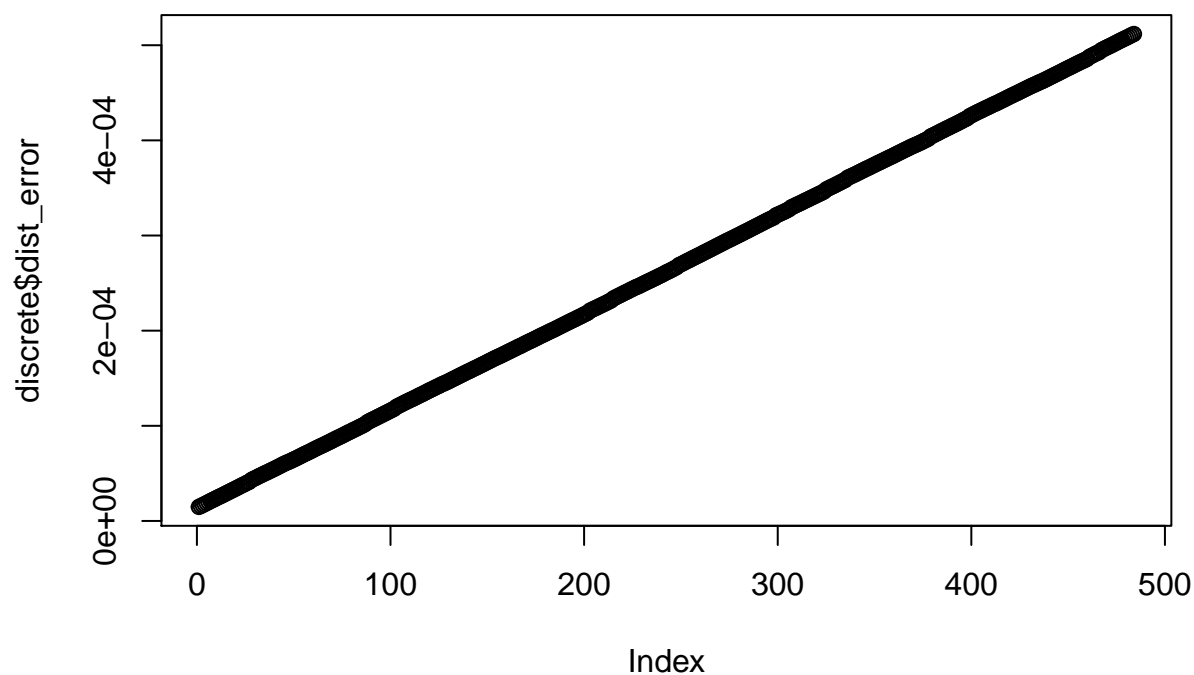
Discrete yaw error over time



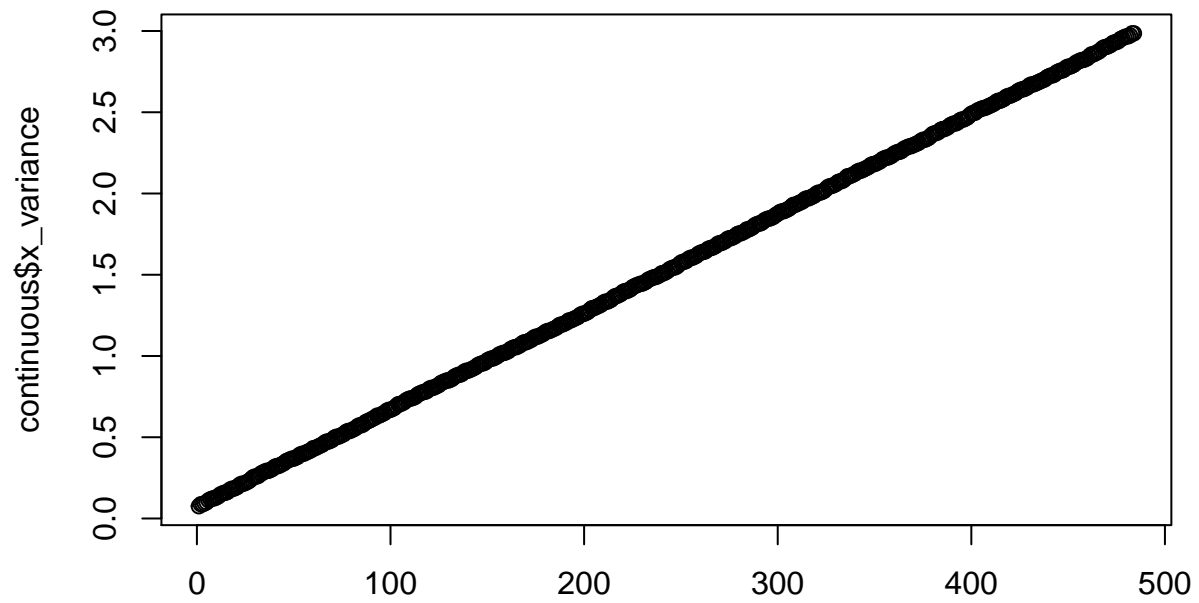
Continuous total distance error over time



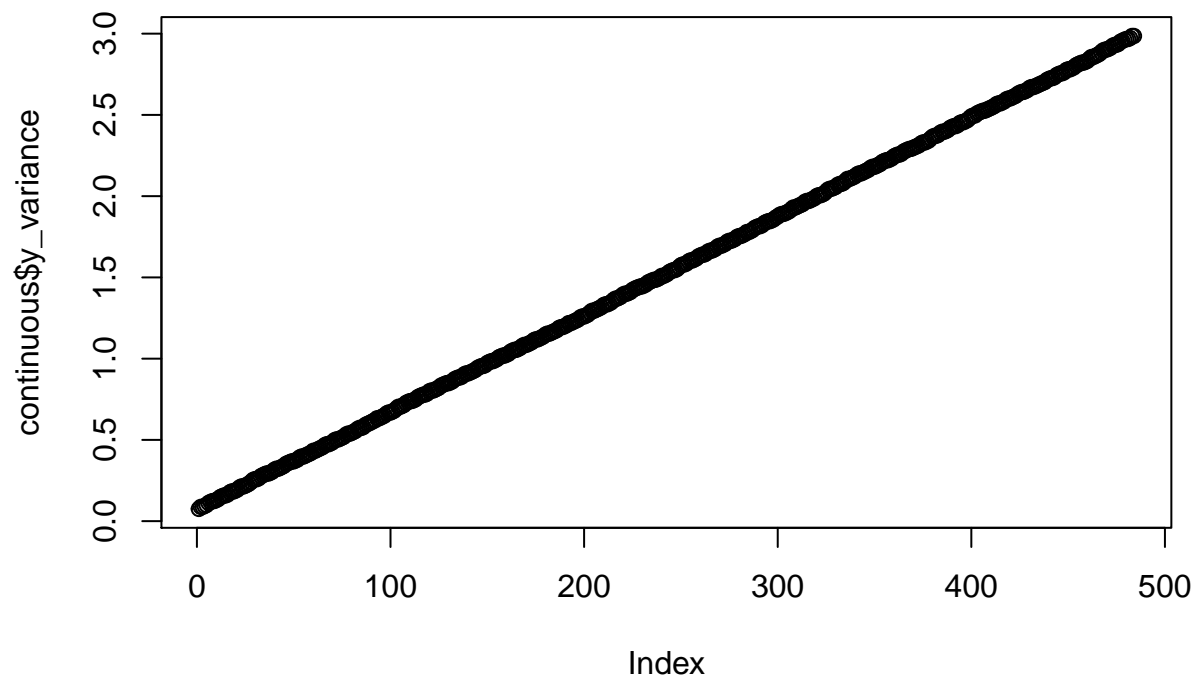
Discrete total distance error over time



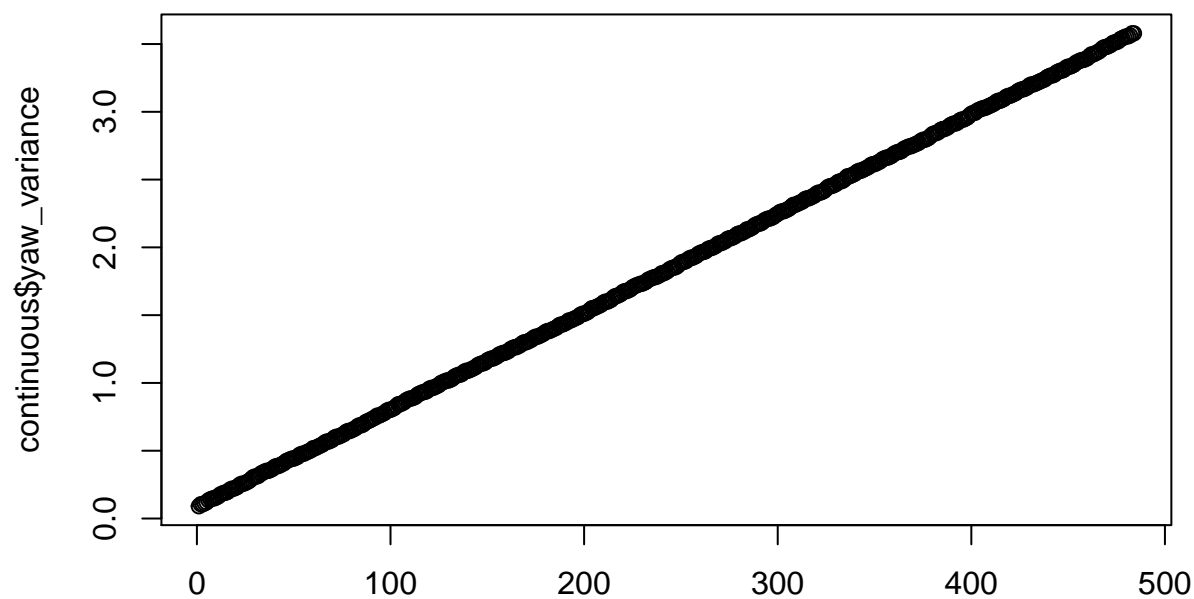
Continuous Filter X Variance Over Time



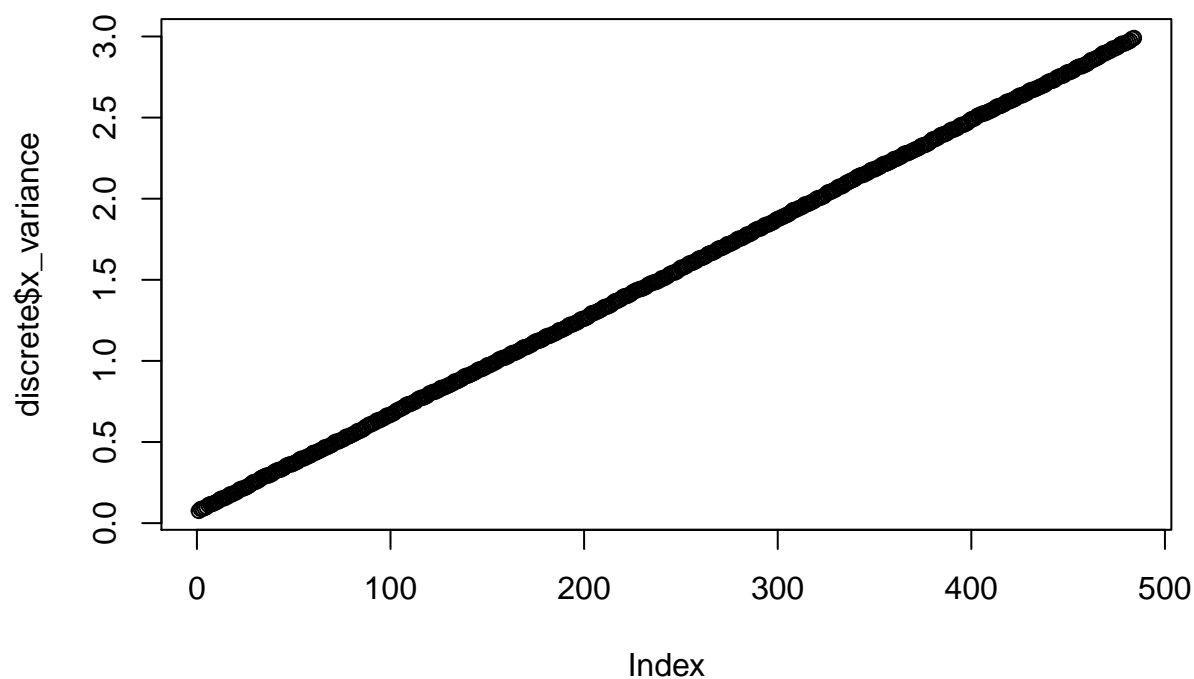
Continuous Filter Y Variance Over Time



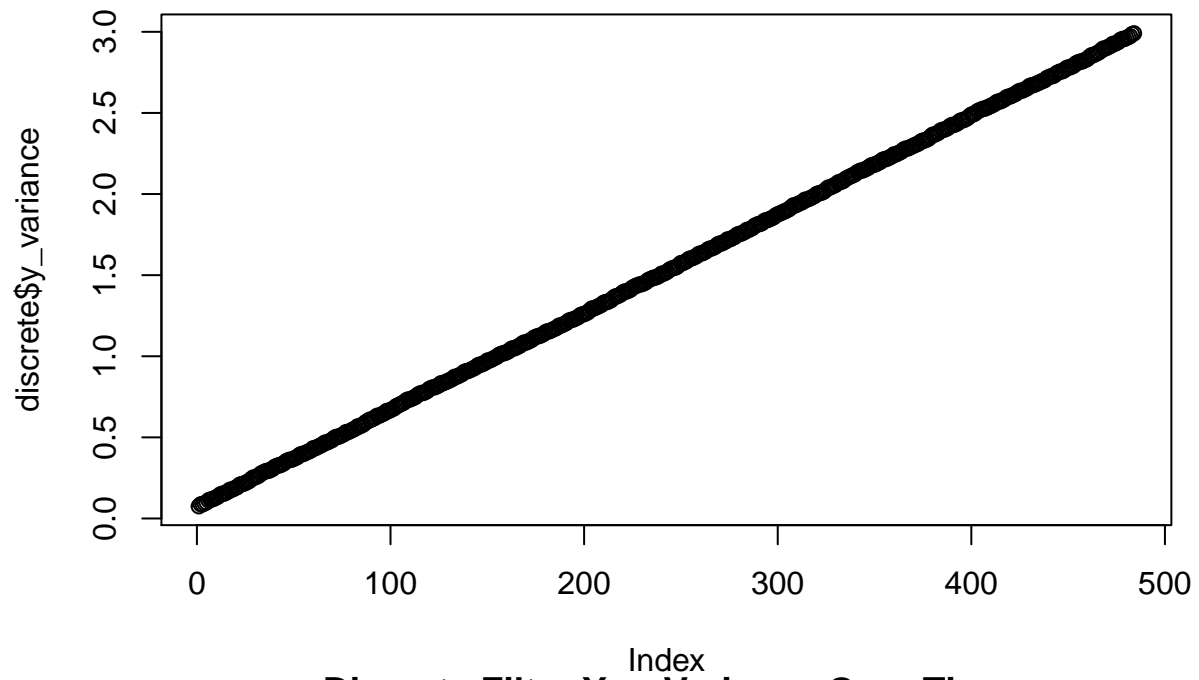
Continuous Filter Yaw Variance Over Time



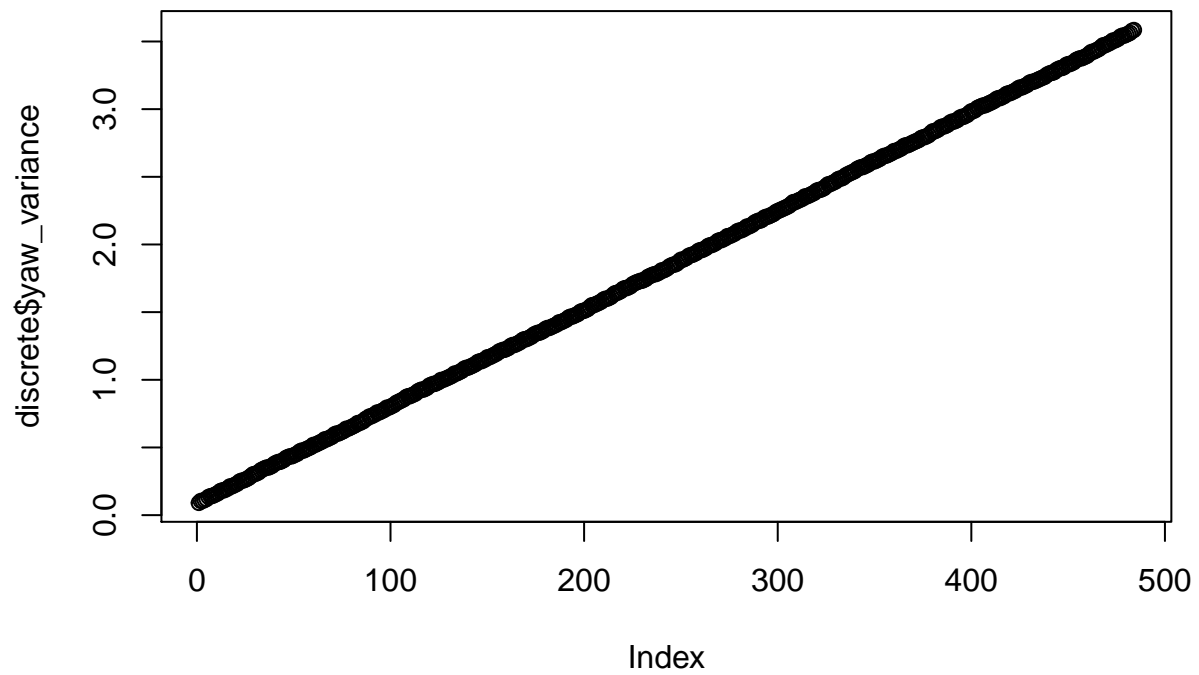
Discrete Filter X Variance Over Time



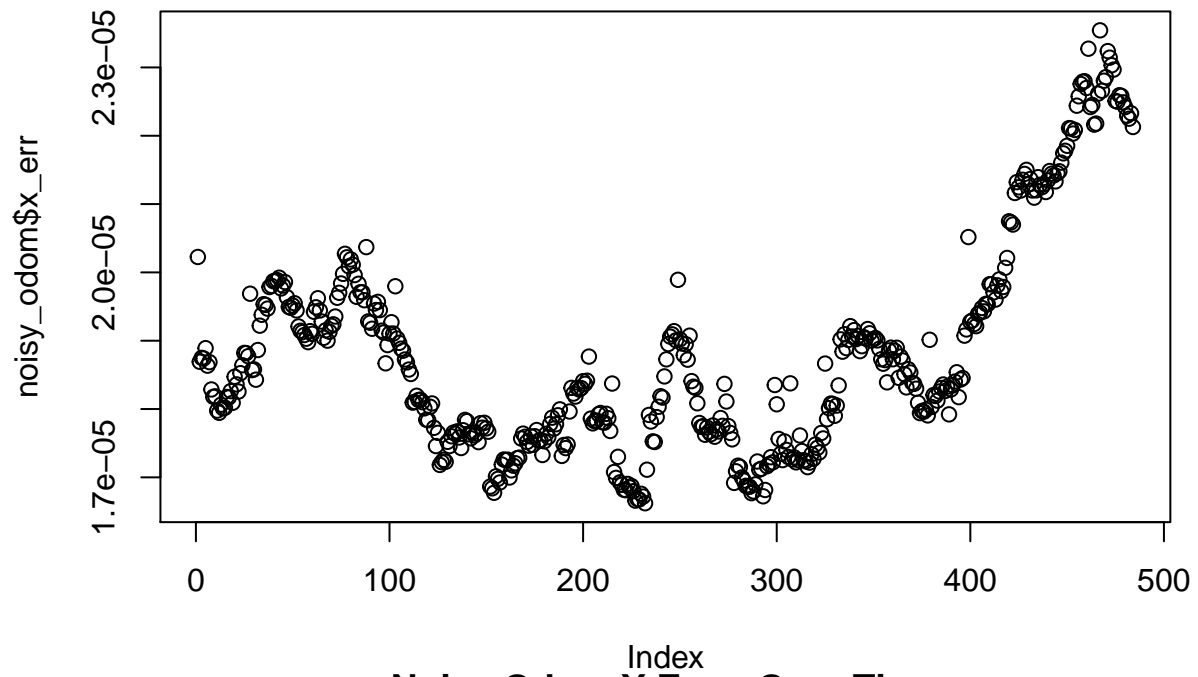
Discrete Filter Y Variance Over Time



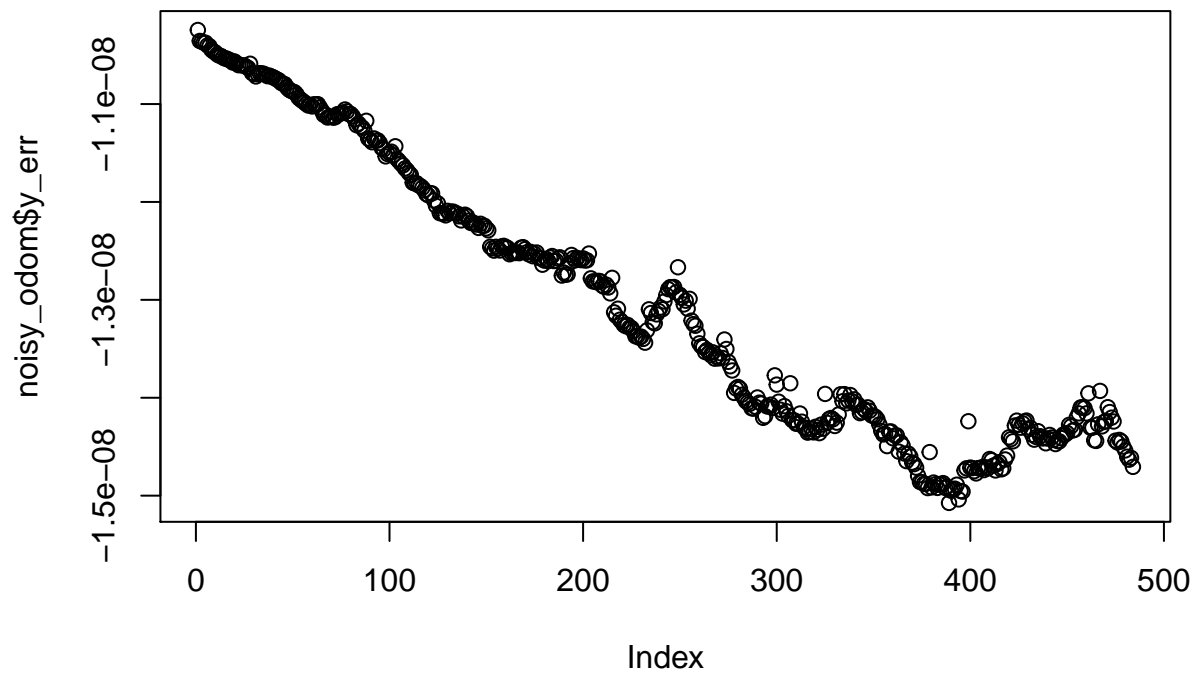
Discrete Filter Yaw Variance Over Time



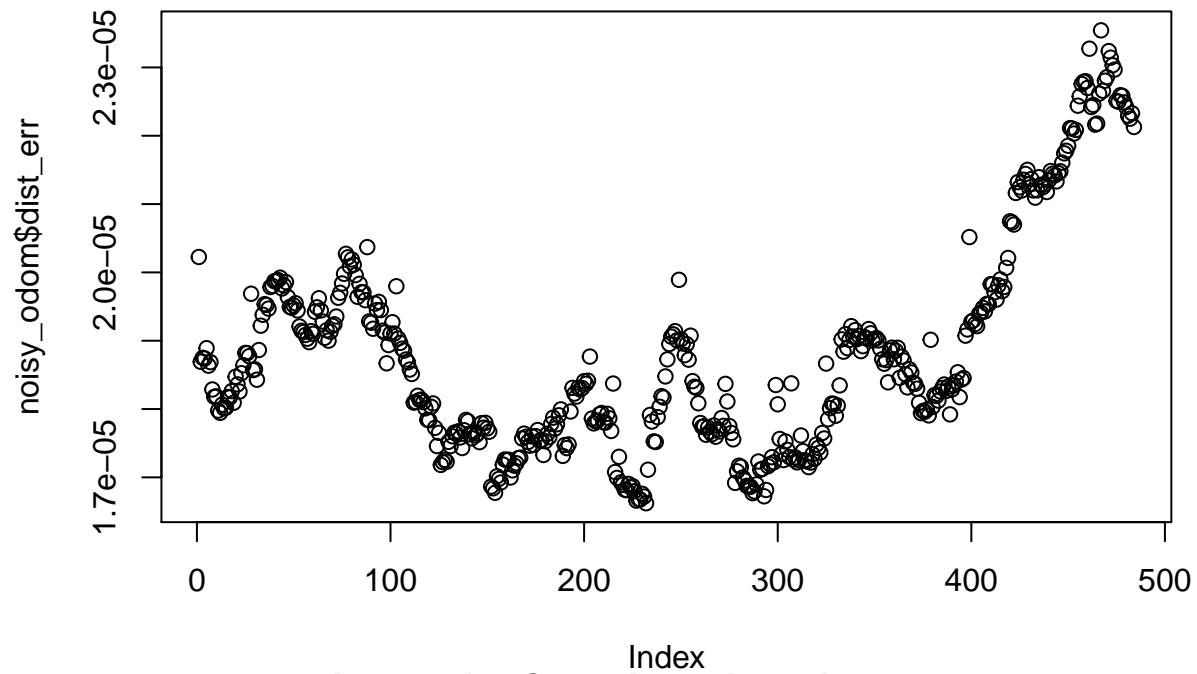
Noisy Odom X Error Over Time



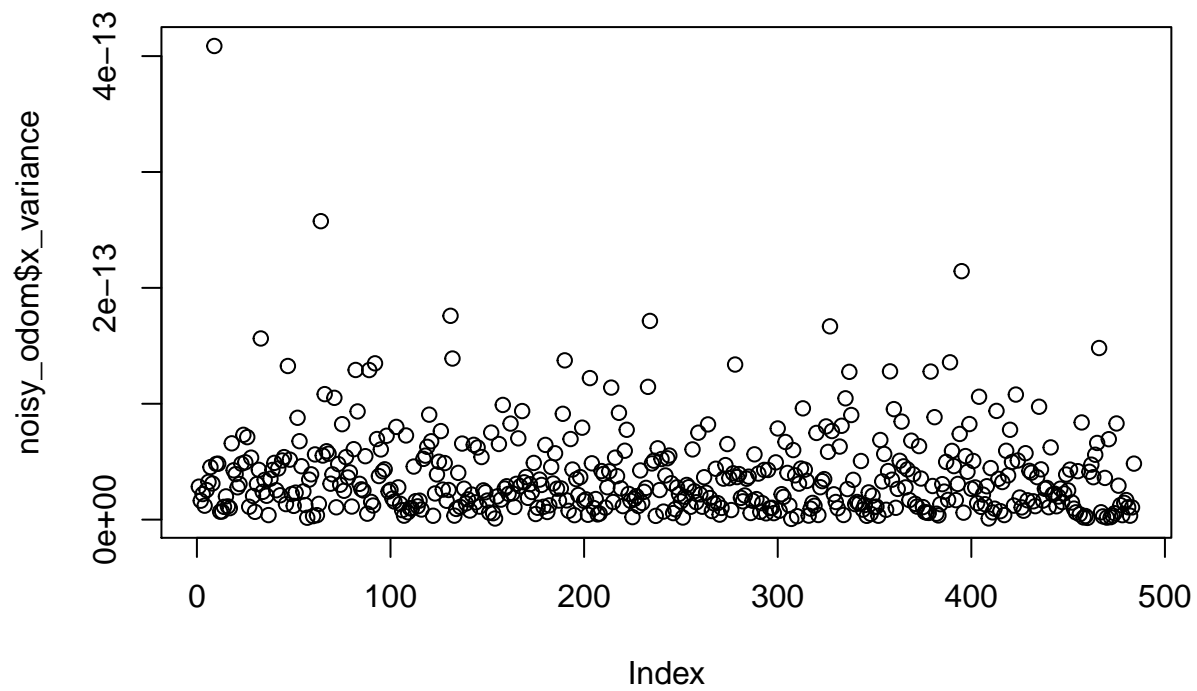
Noisy Odom Y Error Over Time



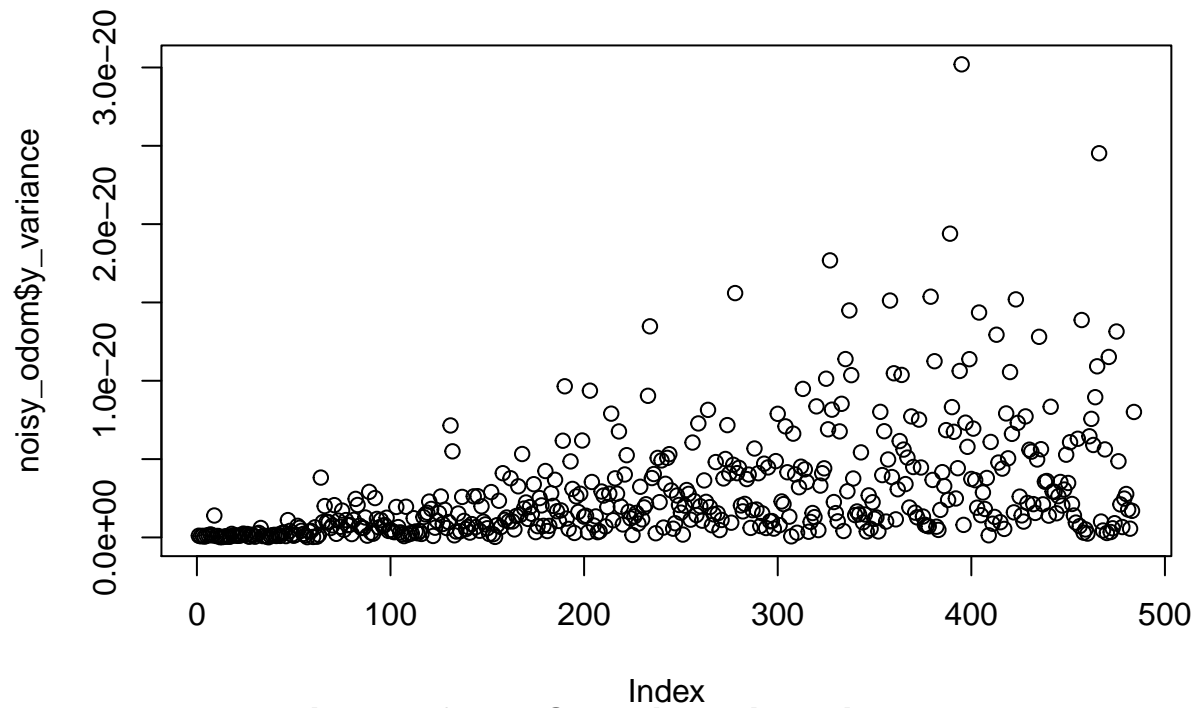
Noisy Odom Horizontal Distance Error Over Time



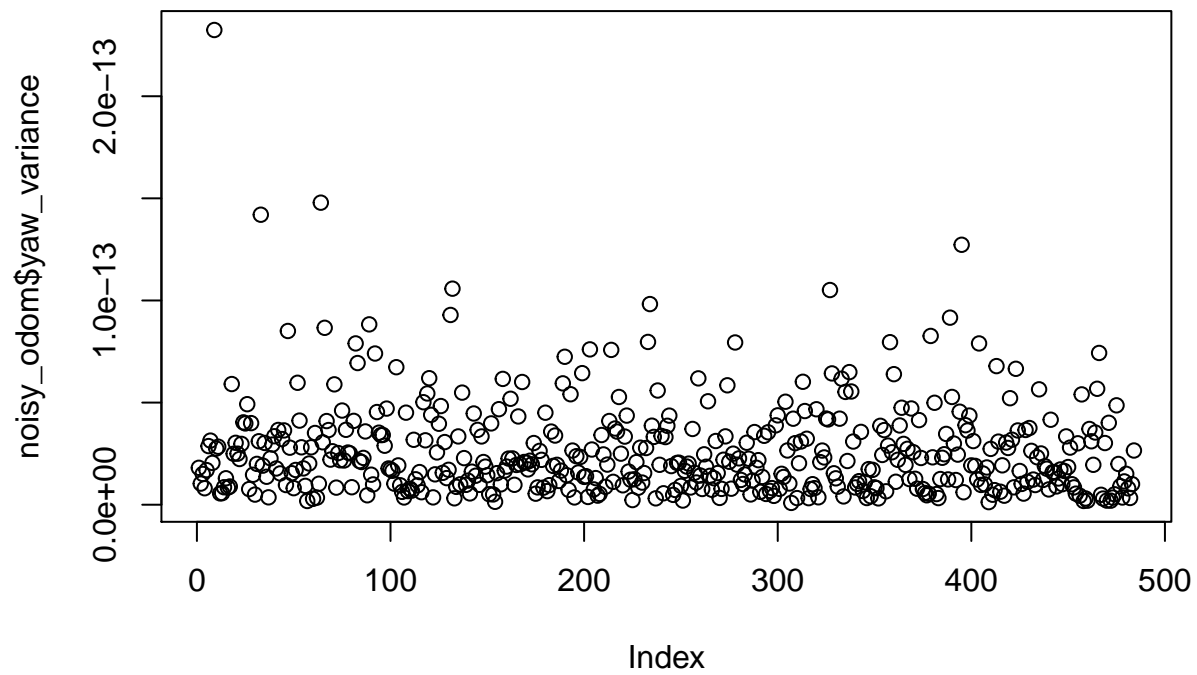
Variance of X Coordinate in Noisy Odometry



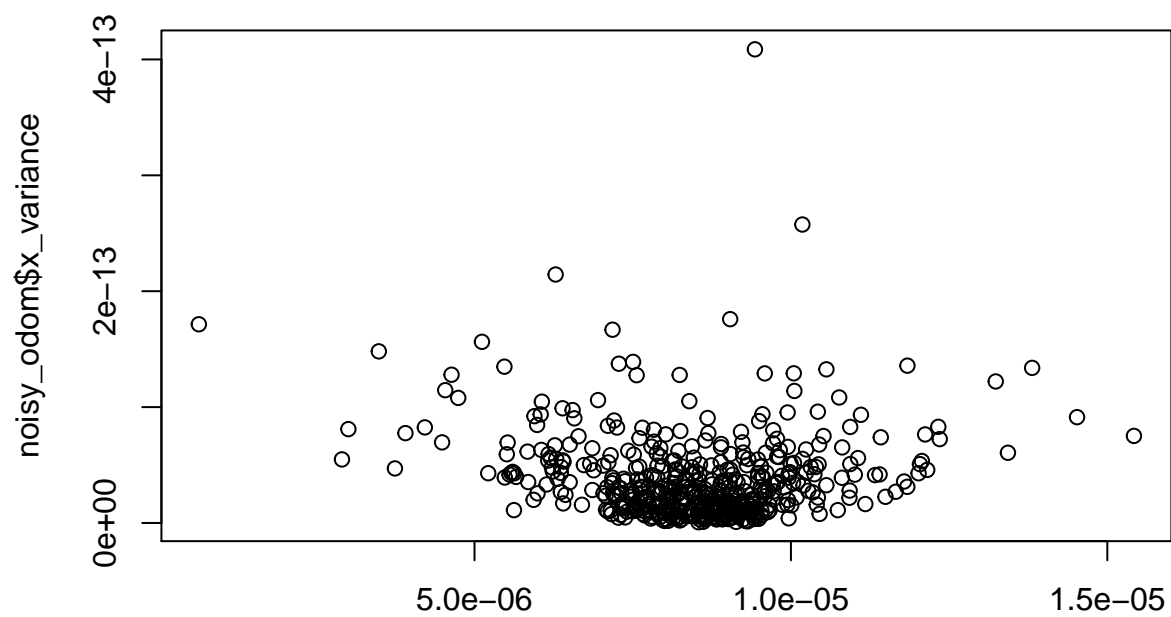
Variance of Y Coordinate in Noisy Odometry



Variance of Yaw Coordinate in Noisy Odometry



Variance vs. Velocity of X in Noisy Odometry



Variance vs. Velocity of Yaw in Noisy Odometry

