two_stationary Turtlebot 2 Report

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This is a summary of the data from the two_stationary experiment, Turtlebot #2.

The runtime of this experiment was 0 hours, 0 minutes, and 59.2 seconds.

The total number of external pose measurements recieved by the robot during this time was 493 which means poses were received at an average of 8.3277027 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.
## -6.581e-07  1.251e-04  2.515e-04  2.516e-04  3.781e-04  5.044e-04
```

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

```
##       Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
## -3.949e-10  1.778e-08  5.785e-08  7.095e-08  1.182e-07  1.925e-07
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 8.018e-05 3.342e-04 4.265e-04 4.169e-04 5.225e-04 5.883e-04
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 3.462e-07 1.251e-04 2.515e-04 2.516e-04 3.781e-04 5.044e-04
```

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

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.2301  0.2301  0.2301  0.2375  0.2301  2.0000
```

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

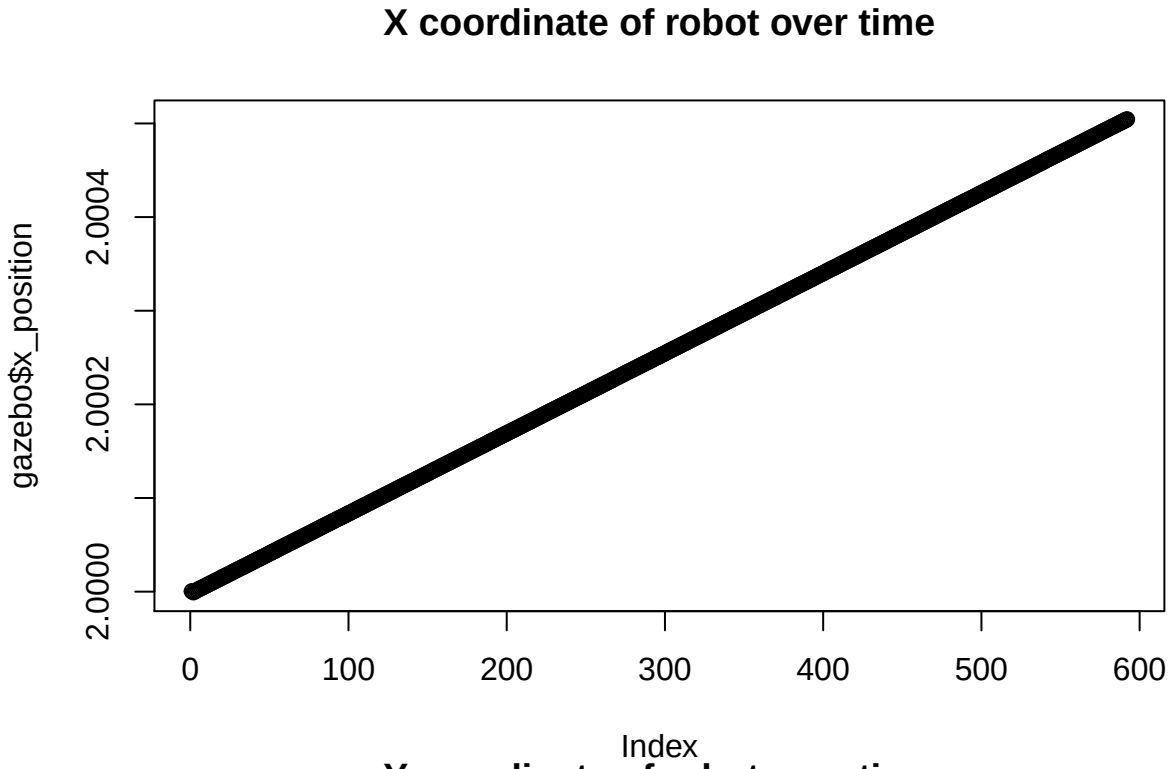
```
##       Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
## -6.272e-04 -4.818e-04 -4.345e-04 -3.934e-04 -2.755e-04 -2.000e-10
```

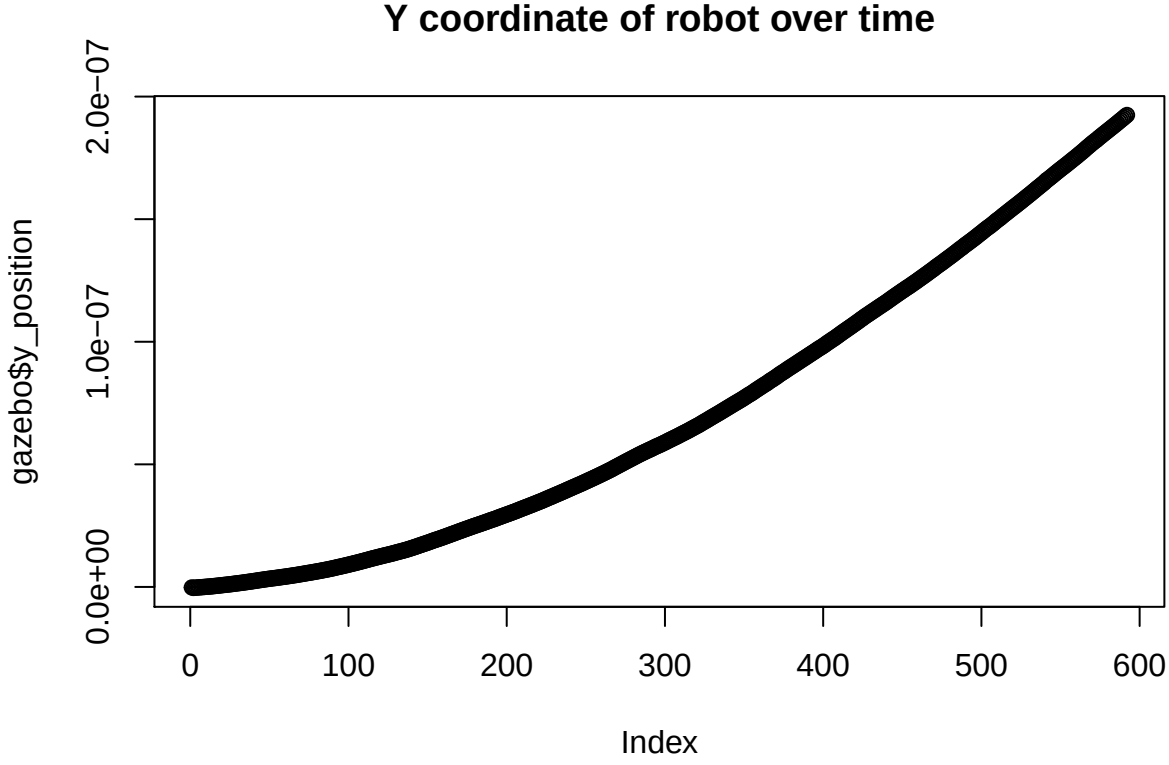
```
summary(discrete$yaw_error)
```

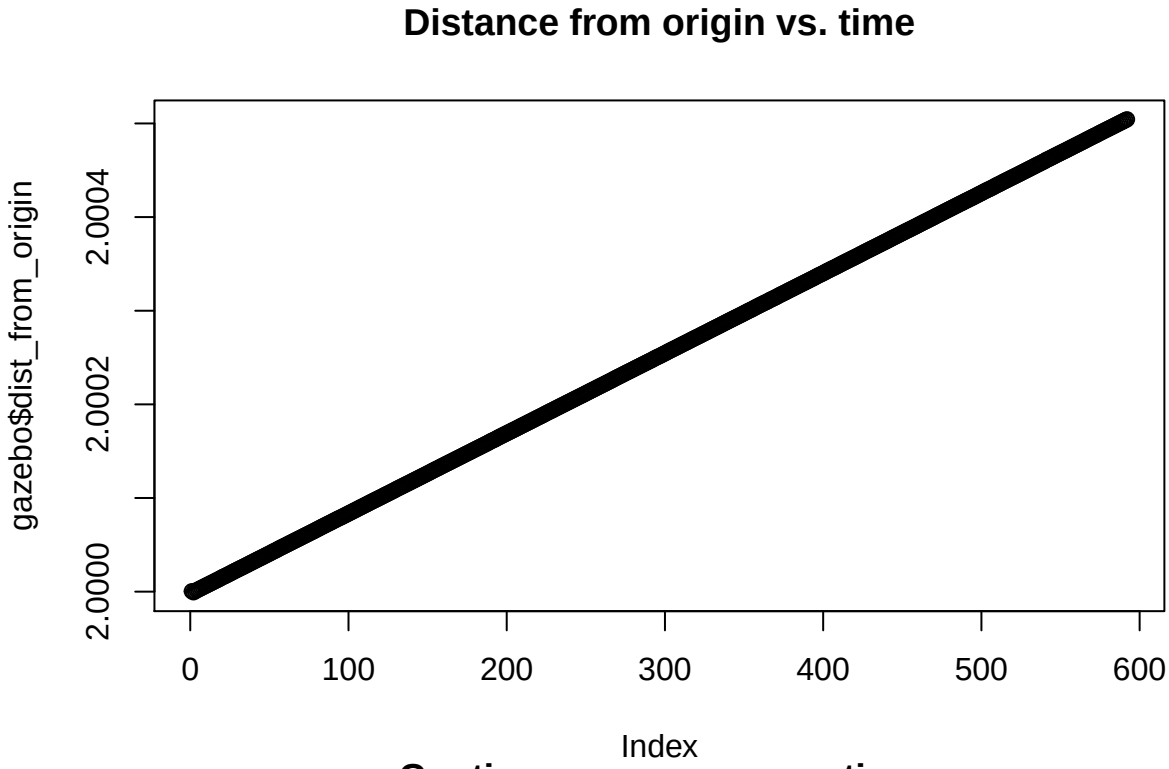
```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.0001377 0.0003342 0.0004270 0.0004170 0.0005225 0.0005884
```

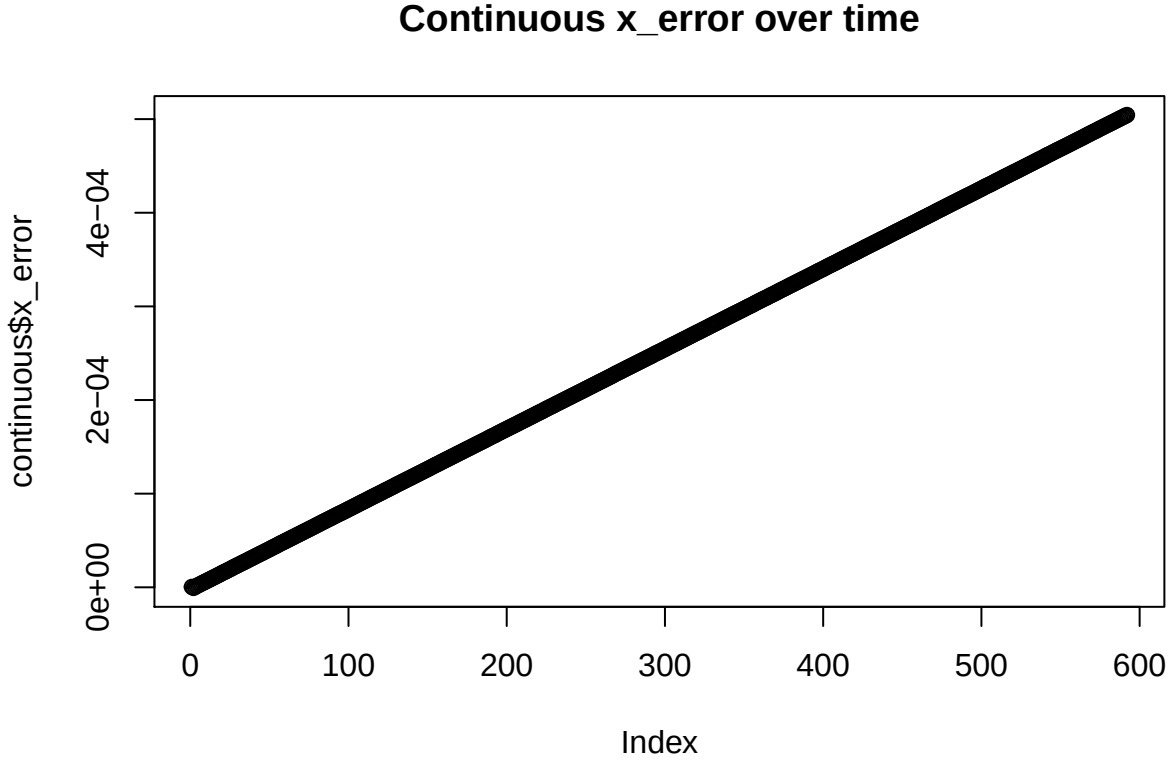
```
summary(discrete$dist_error)
```

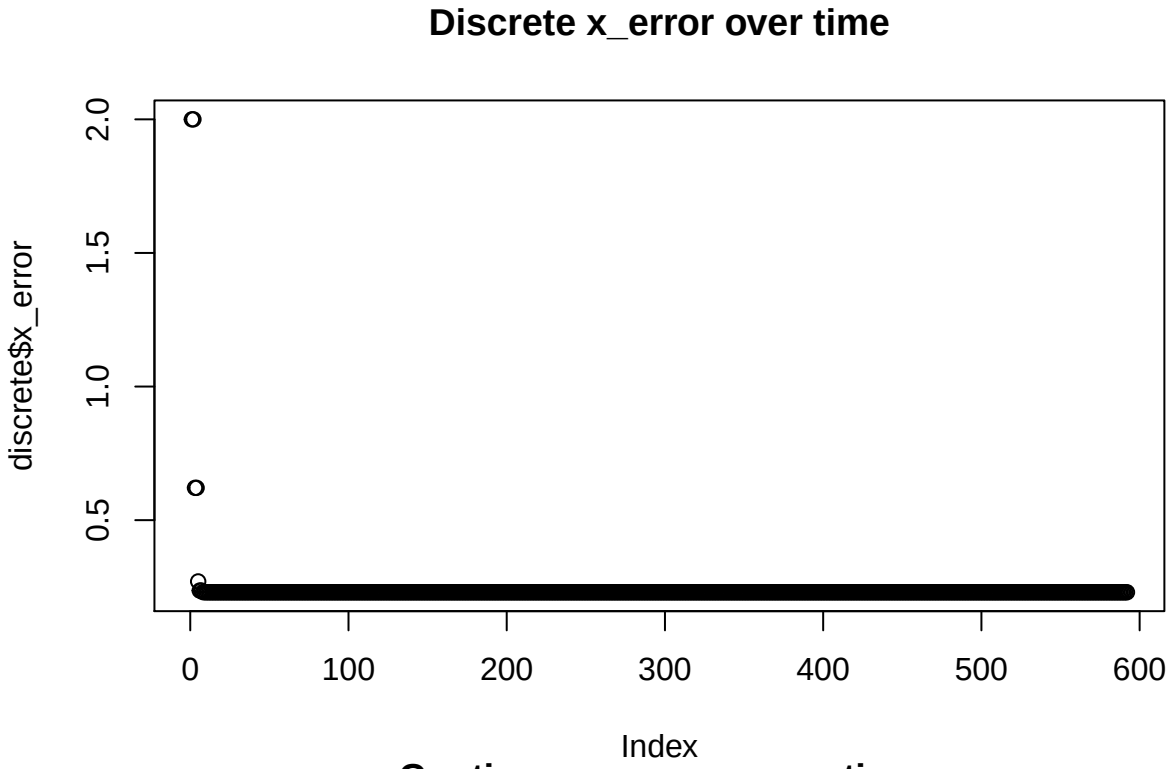
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.2301  0.2301  0.2301  0.2375  0.2301  2.0000
```

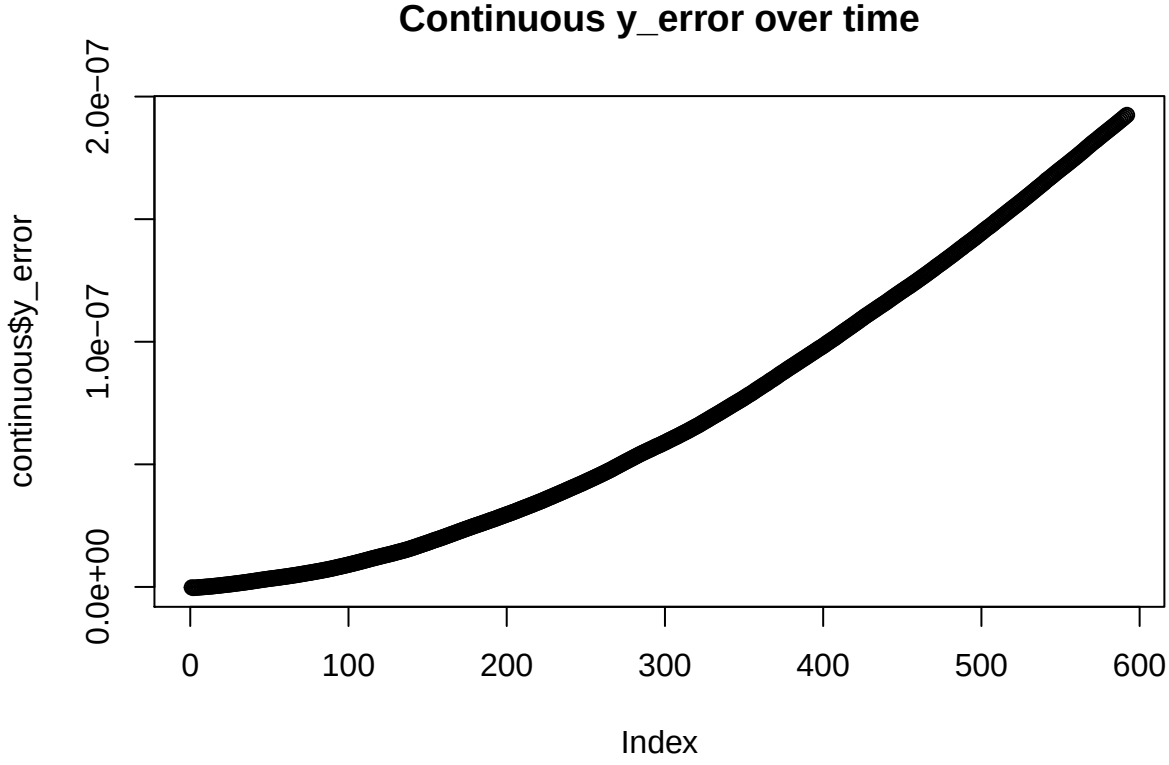

X coordinate of robot over time
gazebo$x_position
2.0000
2.0002
2.0004
0
100
200
300
400
500
600
Index

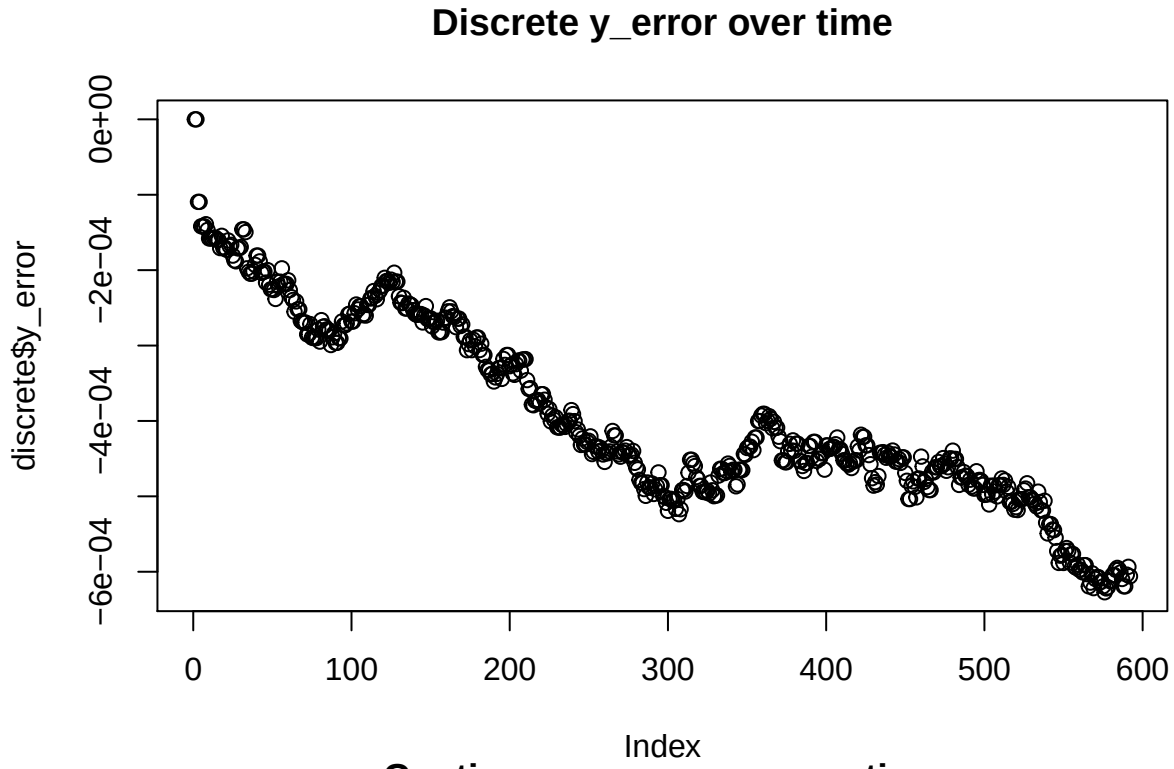

Y coordinate of robot over time
gazebo$y_position
0.0e+00
1.0e−07
2.0e−07
0
100
200
300
400
500
600
Index

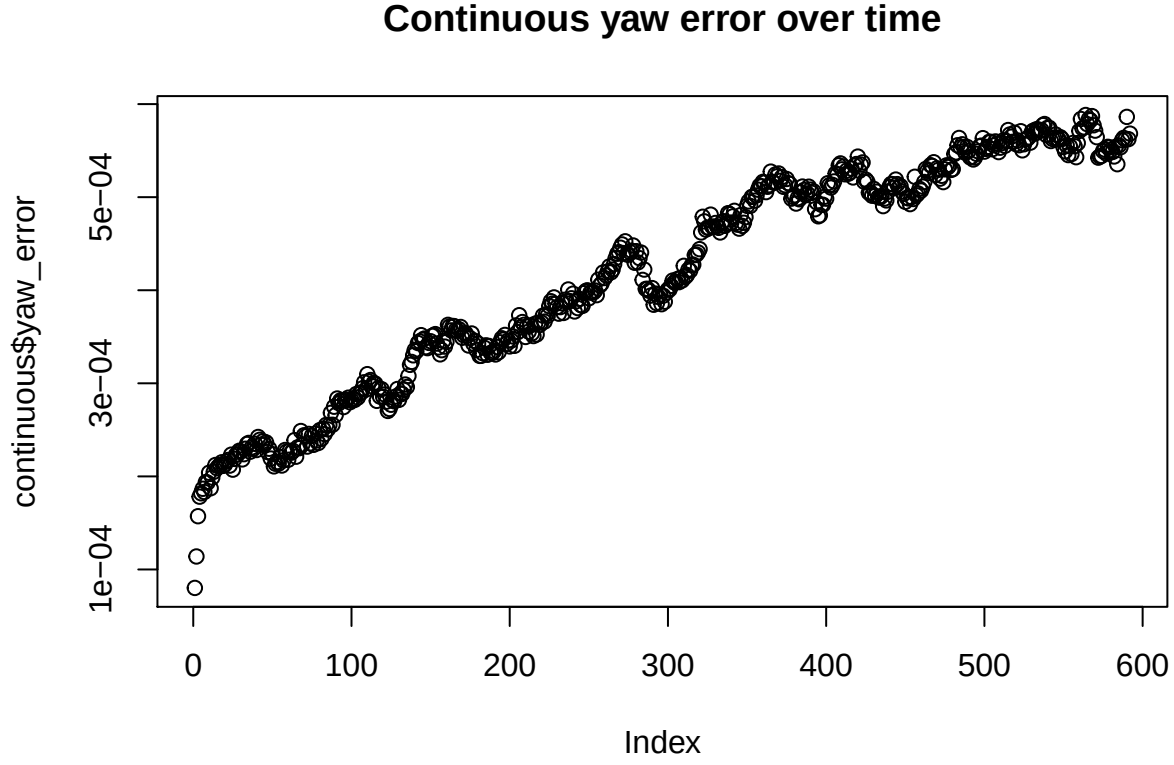

Distance from origin vs. time
gazebo$dist_from_origin
2.0000
2.0002
2.0004
0
100
200
300
400
500
600
Index

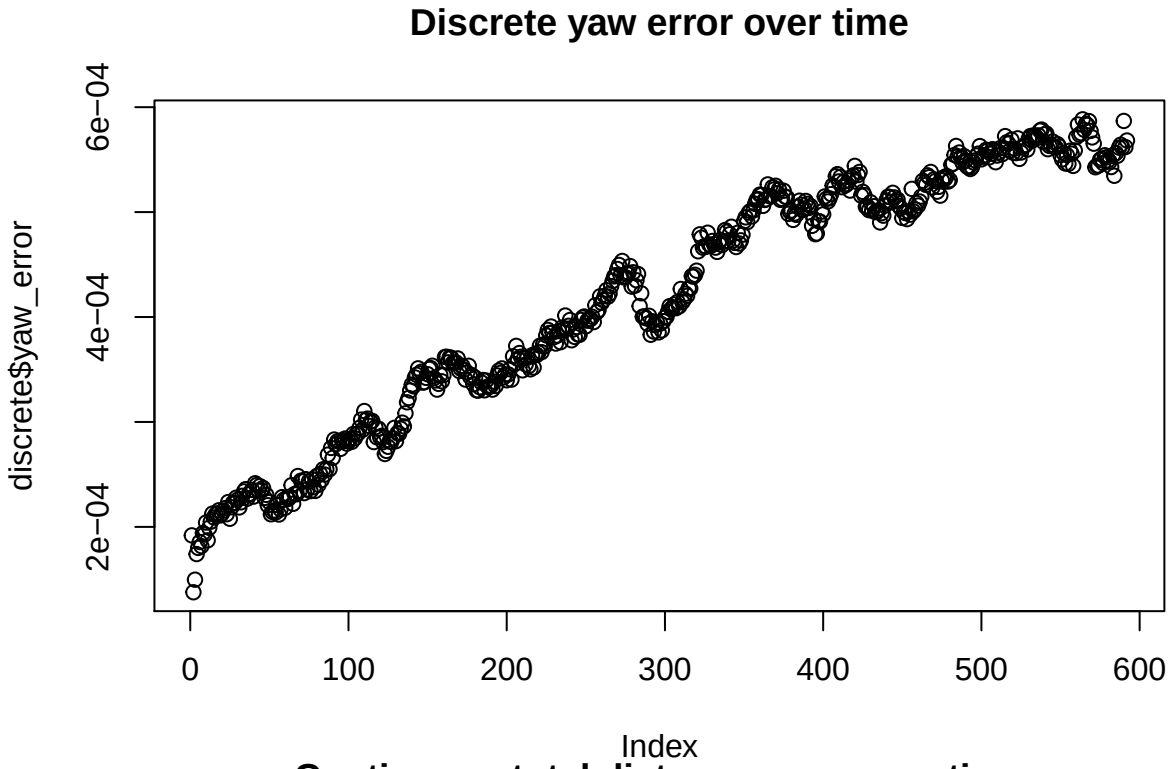

Continuous x_error over time
continuous$x_error
0e+00
2e−04
4e−04
0
100
200
300
400
500
600
Index

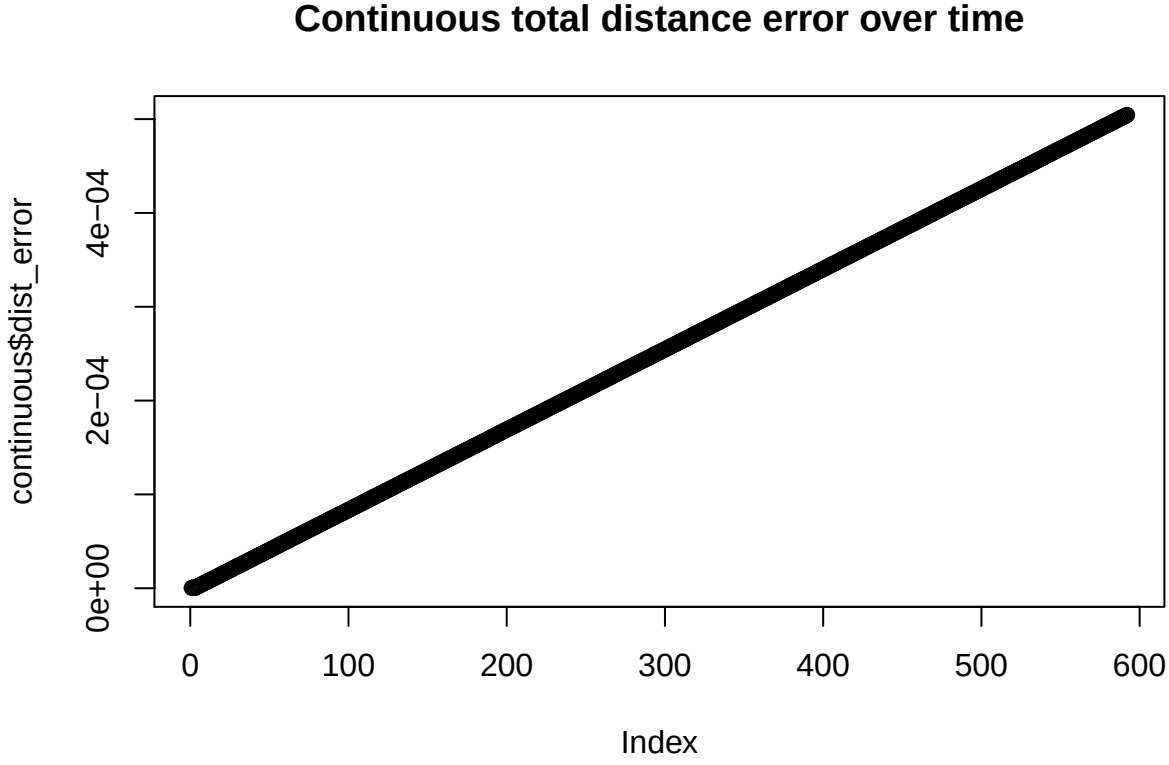

Discrete x_error over time
discrete$x_error
2.0
1.5
1.0
0.5
0
100
200
300
400
500
600
Index

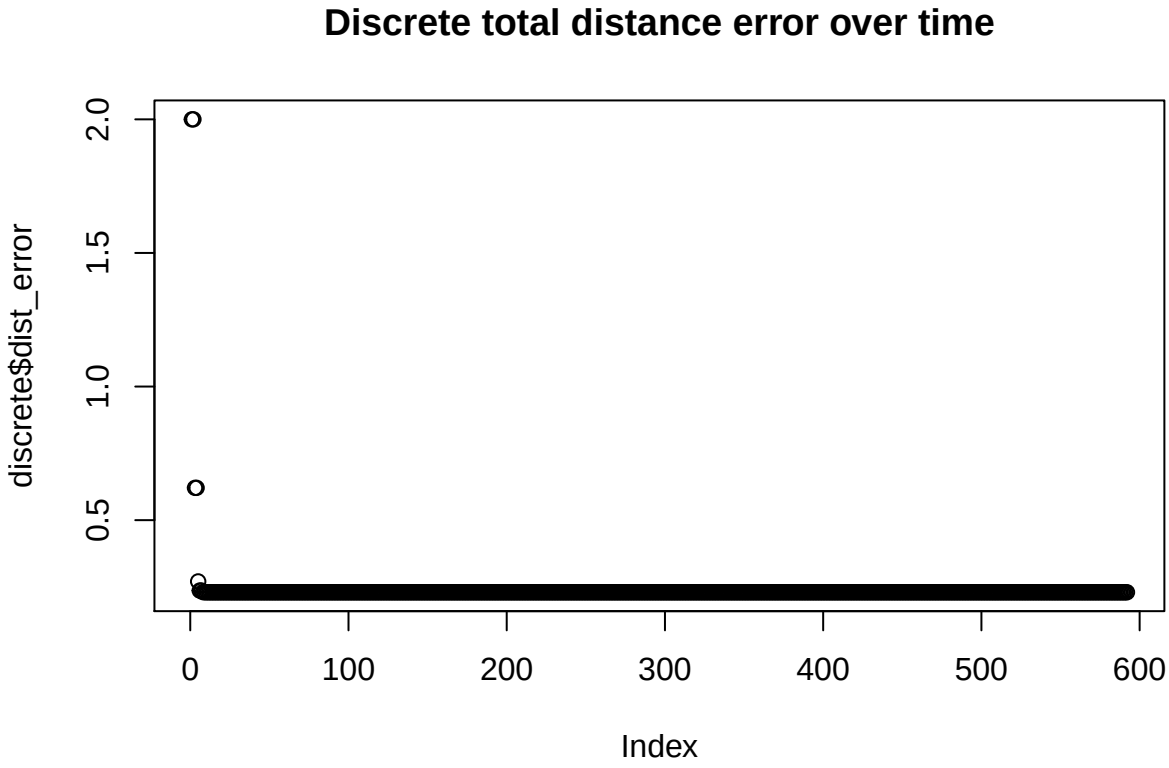

Continuous y_error over time
continuous$y_error
2.0e−07
1.0e−07
0.0e+00
0
100
200
300
400
500
600
Index


Discrete y_error over time
discrete$y_error
0e+00
−2e−04
−4e−04
−6e−04
0
100
200
300
400
500
600
Index


Continuous yaw error over time
continuous$yaw_error
1e−04
3e−04
5e−04
0
100
200
300
400
500
600
Index


Discrete yaw error over time
discrete$yaw_error
2e−04
4e−04
6e−04
0
100
200
300
400
500
600
Index


Continuous total distance error over time
continuous$dist_error
0e+00
2e−04
4e−04
0
100
200
300
400
500
600
Index


Discrete total distance error over time
discrete$dist_error
0.5
1.0
1.5
2.0
0
100
200
300
400
500
600
Index