one_mobile_imu_yaw Experiment Report

Matthew Swartwout

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This is a summary of the data from the one_mobile_imu_yaw experiment.

Shown below is the summary of the error of all robots combined 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.
## -0.039950 -0.023130 -0.019140 -0.017030 -0.009125  0.013670
```

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

```
##       Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
## -1.853e-02  1.676e-05  3.586e-03  4.906e-03  7.124e-03  3.108e-02
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 9.000e-08 9.898e-03 2.205e-02 2.051e-02 2.762e-02 4.500e-02
```

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

```
##       Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
## -0.0195600 -0.0038670  0.0018280  0.0005286  0.0045680  0.0256400
```

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

```
##       Min.    1st Qu.     Median       Mean    3rd Qu.       Max.
## -0.0277600 -0.0058540 -0.0020090 -0.0008069  0.0005505  0.0233800
```

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

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 8.700e-08 4.522e-03 8.843e-03 1.035e-02 1.603e-02 2.848e-02
```

```
summary(external_data_averages)
```

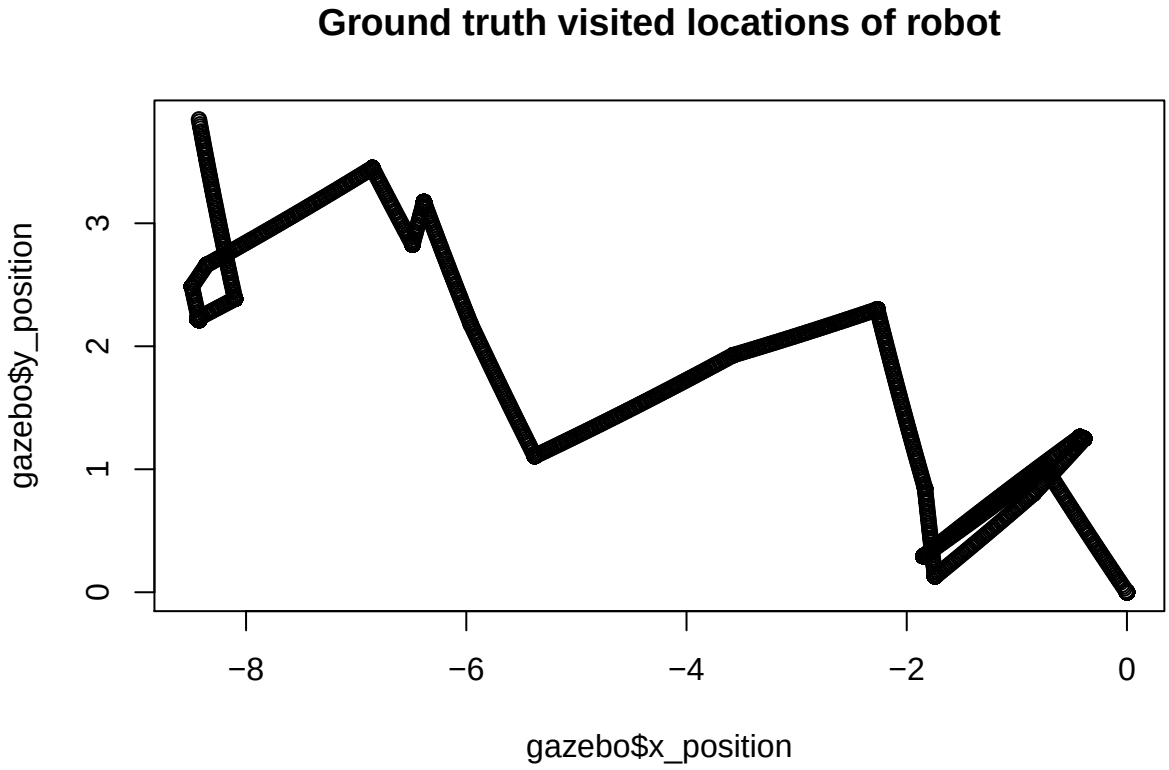
```
##      Length Class  Mode
## [1,] 1      -none- numeric
```

Shown below are plots representing the robot's motion and error over time.

```
message("ground truth")
```

```
## ground truth
```

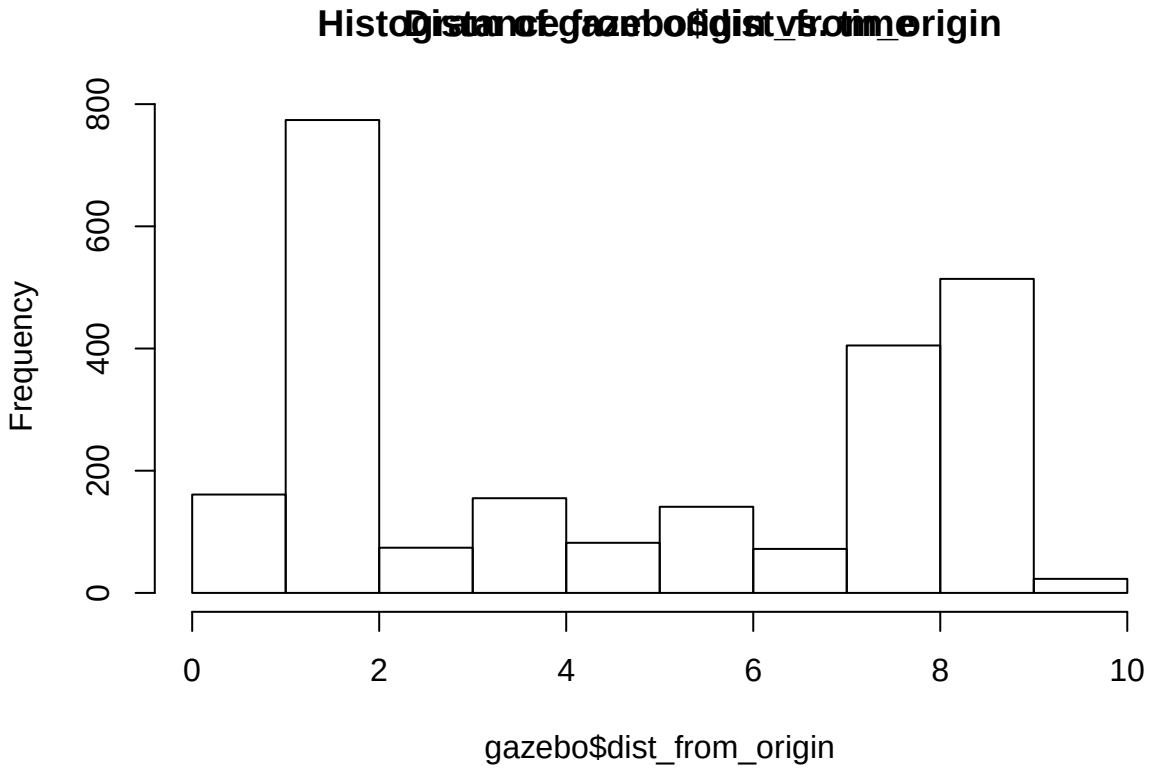
```
plot(gazebo$x_position, gazebo$y_position)
title("Ground truth visited locations of robot")
```




```
message("dist from origin")
```

```
## dist from origin
```

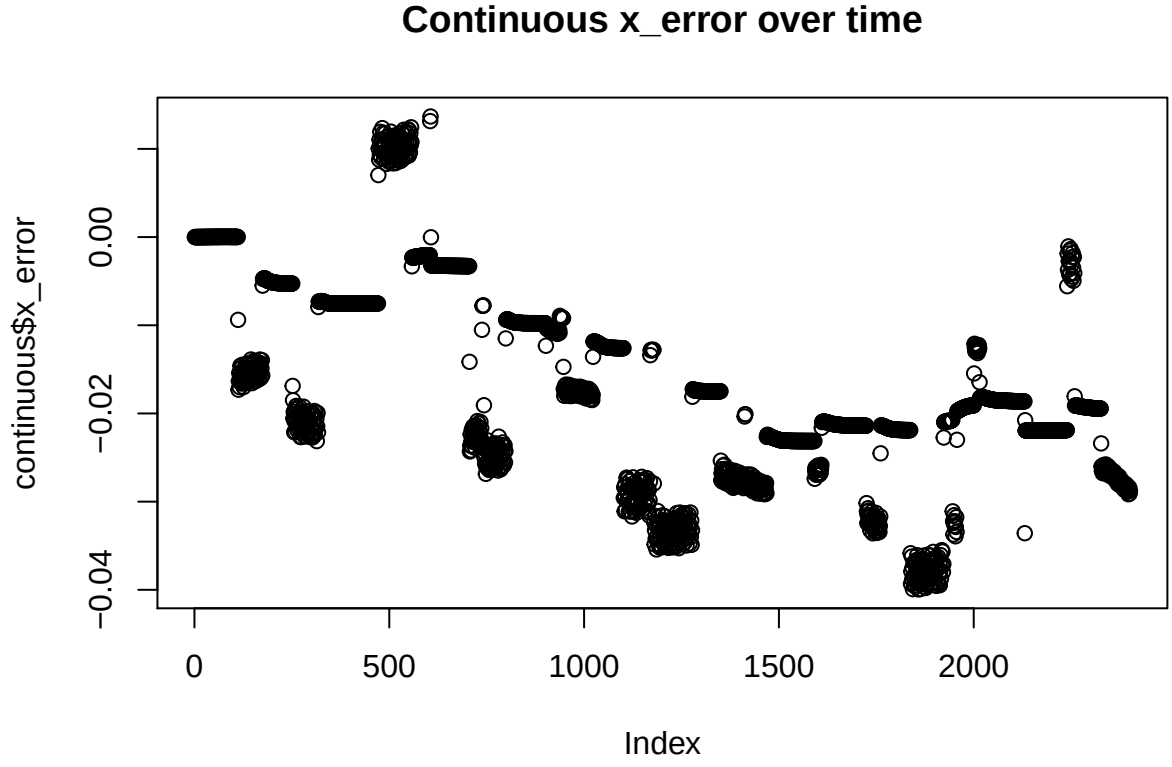
```
hist(gazebo$dist_from_origin)
title("Distance from origin vs. time")
```




```
message("continuous x")
```

```
## continuous x
```

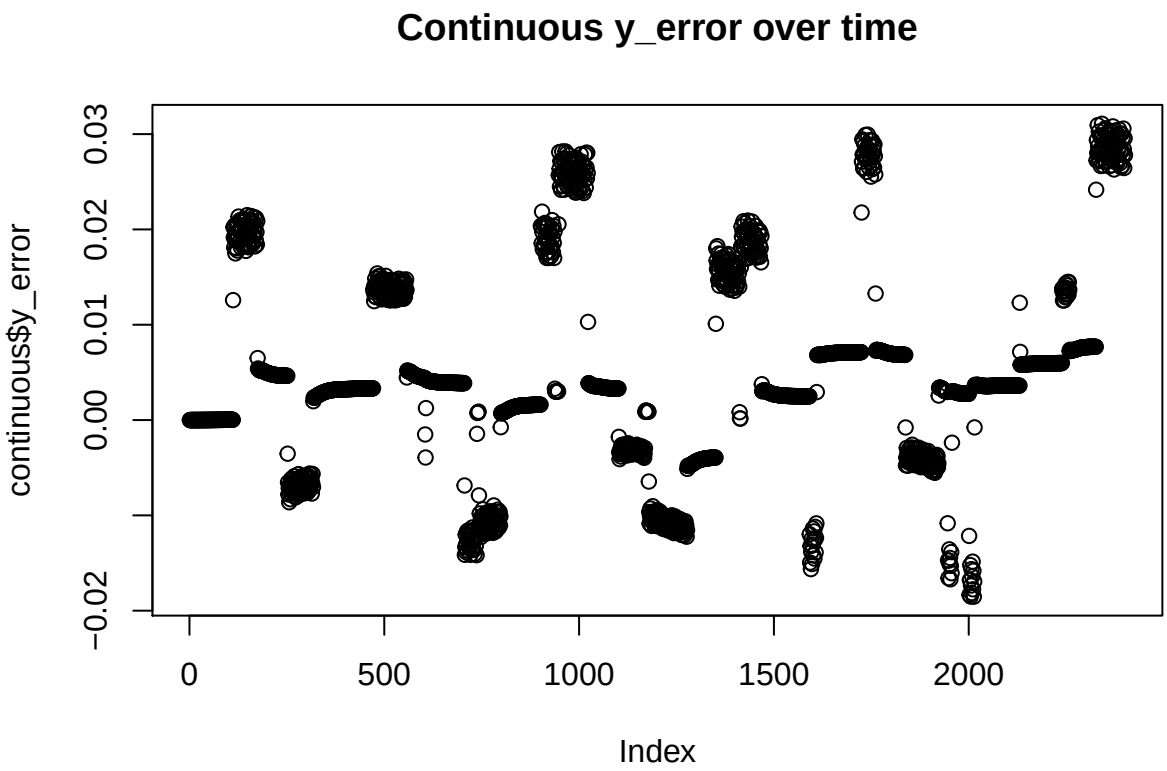
```
plot(continuous$x_error)
title("Continuous x_error over time")
```



```r
message("continous y")
```

```
## continous y
```

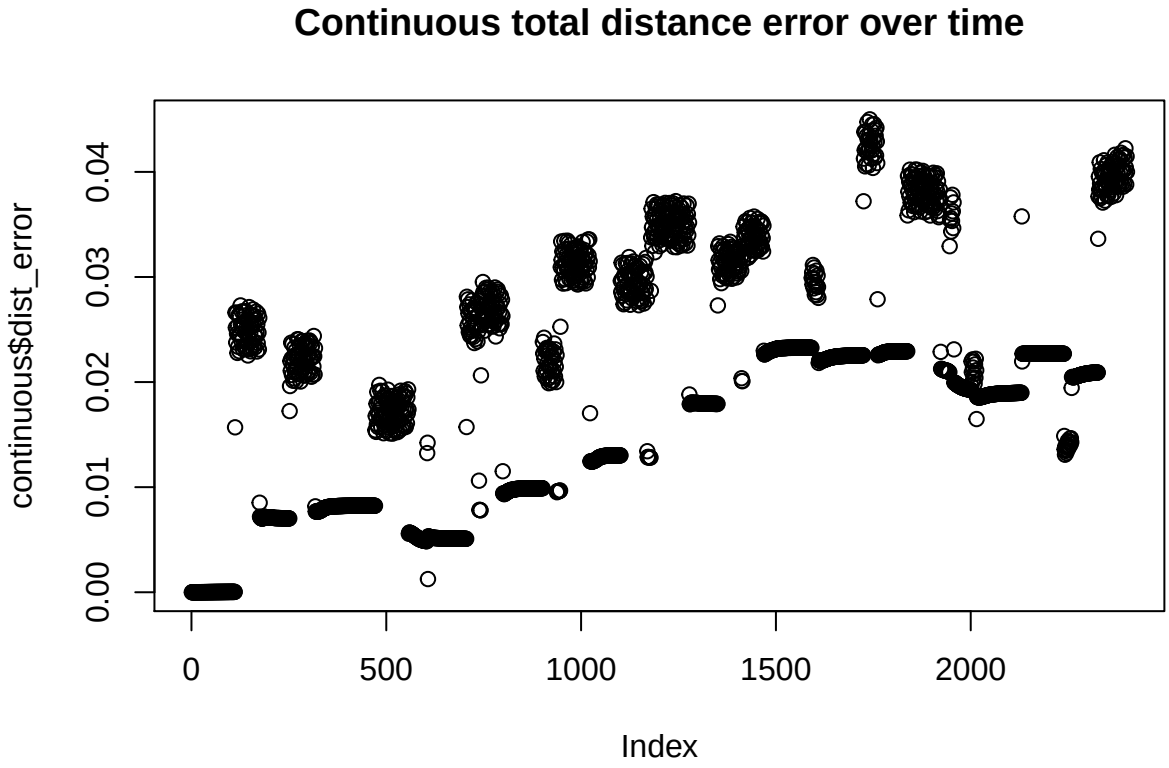
```r
plot(continuous$y_error)
title("Continuous y_error over time")
```




```r
message("continuous dist")
```

```
## continuous dist
```

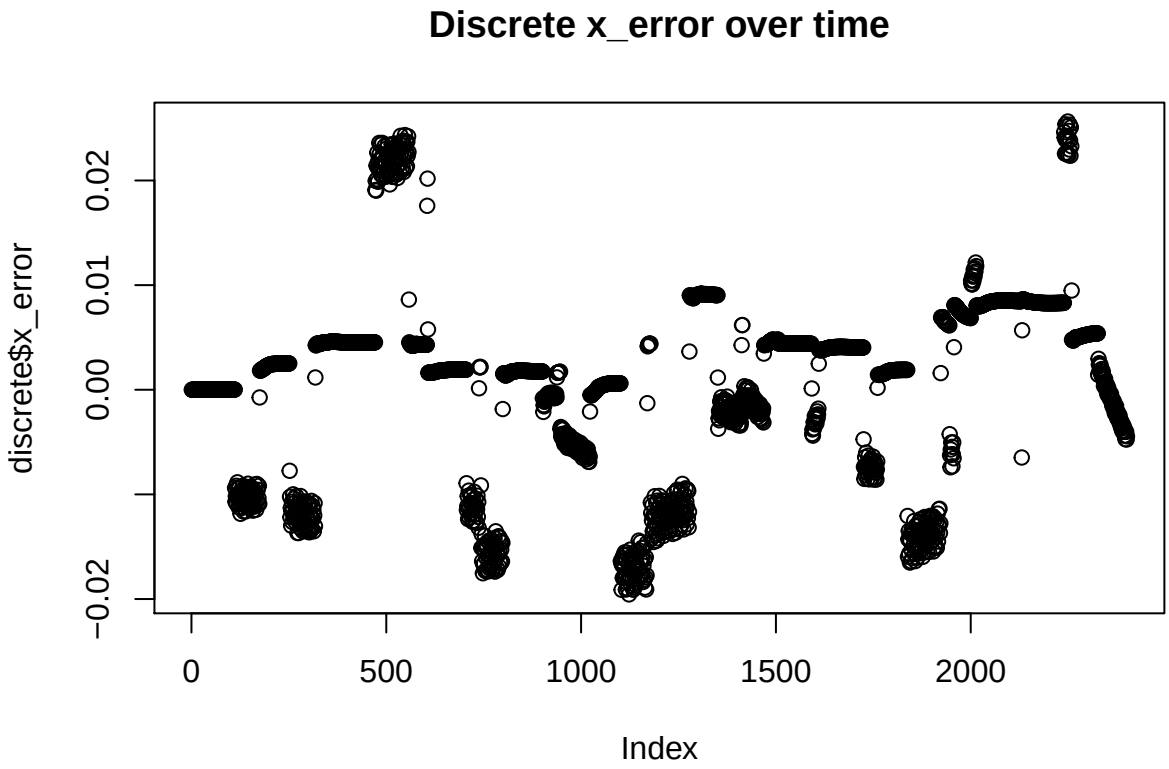
```r
plot(continuous$dist_error)
title("Continuous total distance error over time")
```




```
message("discrete x")
```

```
## discrete x
```

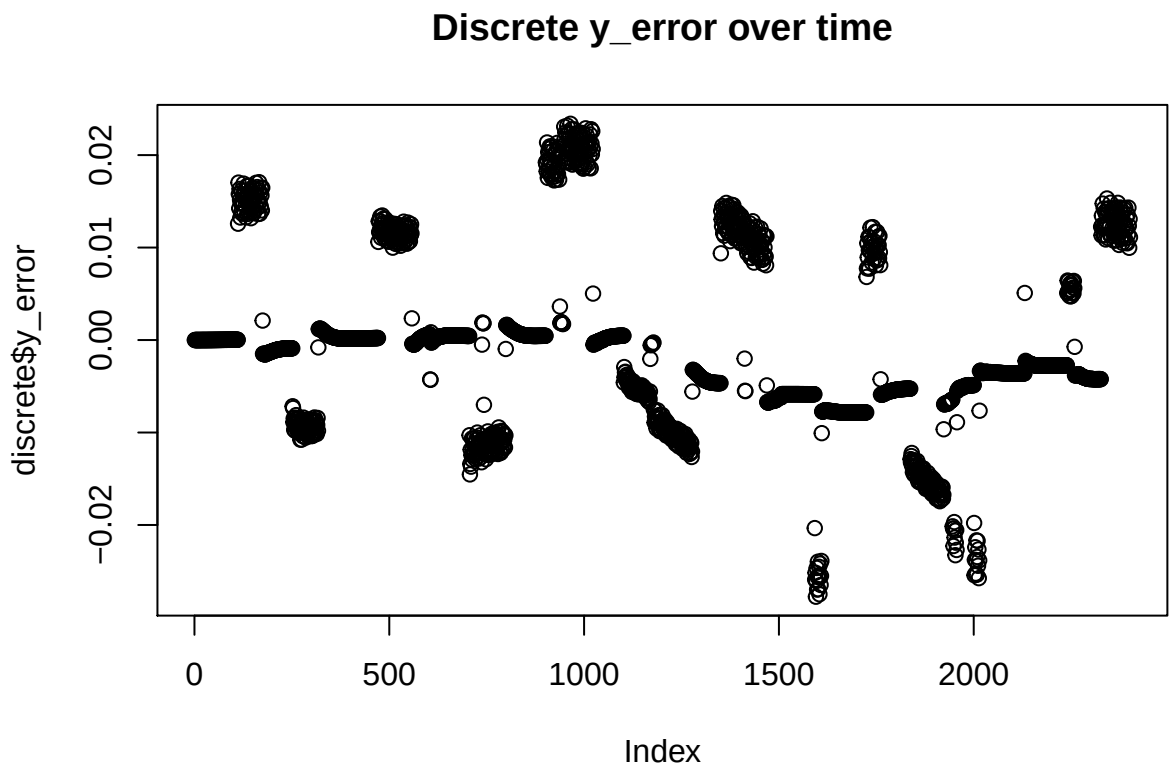
```
plot(discrete$x_error)
title("Discrete x_error over time")
```



```
message("discrete y")
```

```
## discrete y
```

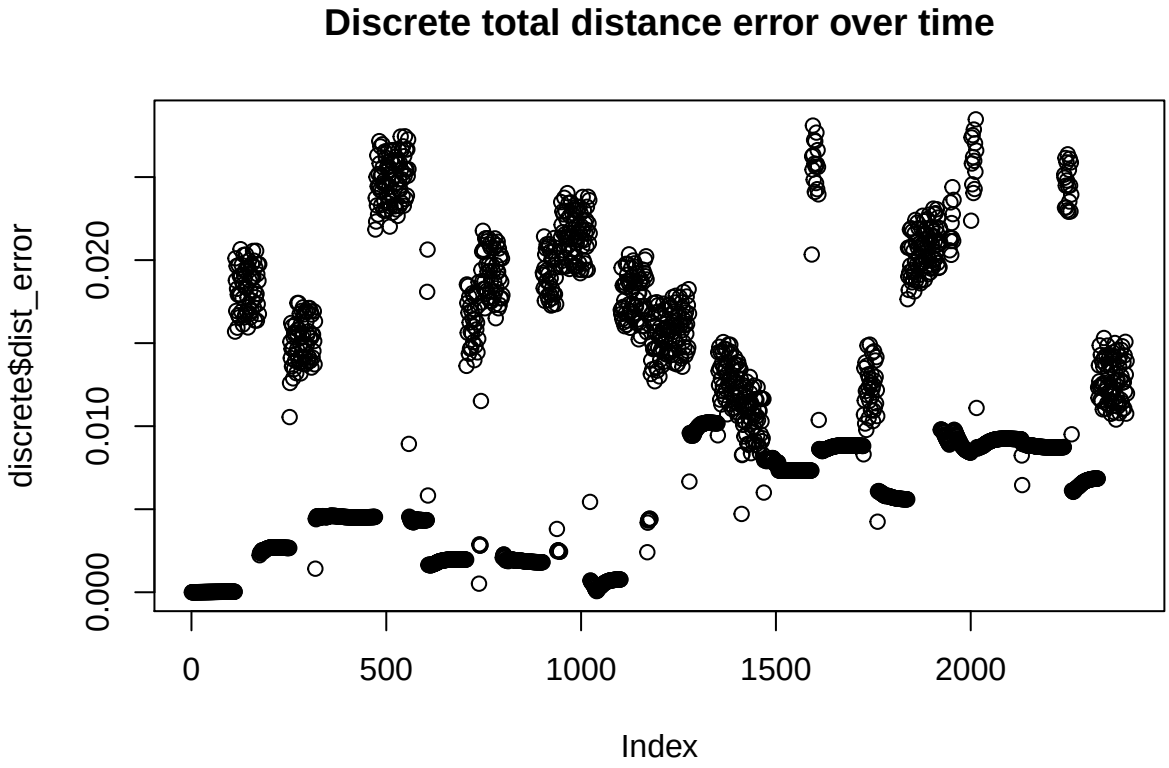
```
plot(discrete$y_error)
title("Discrete y_error over time")
```




```
message("discrete dist")
```

```
## discrete dist
```

```
plot (discrete$dist_error)
title("Discrete total distance error over time")
```


Discrete total distance error over time
discrete$dist_error
0.000
0.010
0.020
0
500
1000
1500
2000
Index