

five_mobile_restricted Turtlebot 5 Report

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This is a summary of the data from the five_mobile_restricted experiment, Turtlebot #5.

The runtime of this experiment was 0 hours, 0 minutes, and 58.1 seconds.

The total number of external pose measurements recieved by the robot during this time was 872 which means poses were received at an average of 15.0086059 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.
## -3.169e-02 -3.093e-04 -2.490e-06 -3.628e-04  4.854e-05  1.893e-02
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## -2.146e-02 -7.513e-05  6.500e-07  5.949e-05  3.503e-04  4.610e-02
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## -6.283000 -0.082380  0.001367 -0.104600  0.009794  6.120000
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## 1.100e-07 4.530e-06 3.522e-04 3.015e-03 4.138e-03 5.594e-02
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## -5.38400 -2.97300 -1.12400 -1.51500 -0.02004  0.22670
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## -2.529000 -0.384000 -0.011640 -0.173300  0.007496  2.601000
```

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

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## -6.186000 -0.226800  0.000008 -0.017710  0.085110  6.268000
```

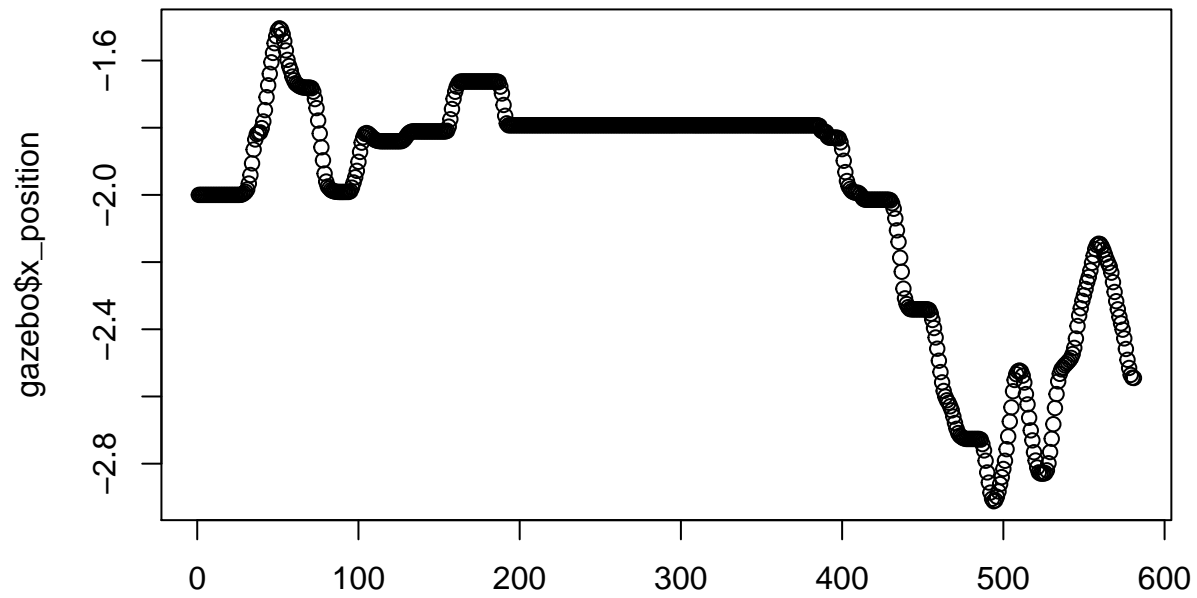
```
summary(discrete$dist_error)
```

```
##      Min.    1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.000000 0.04941 1.43400 1.65900 3.07900 5.38700
```

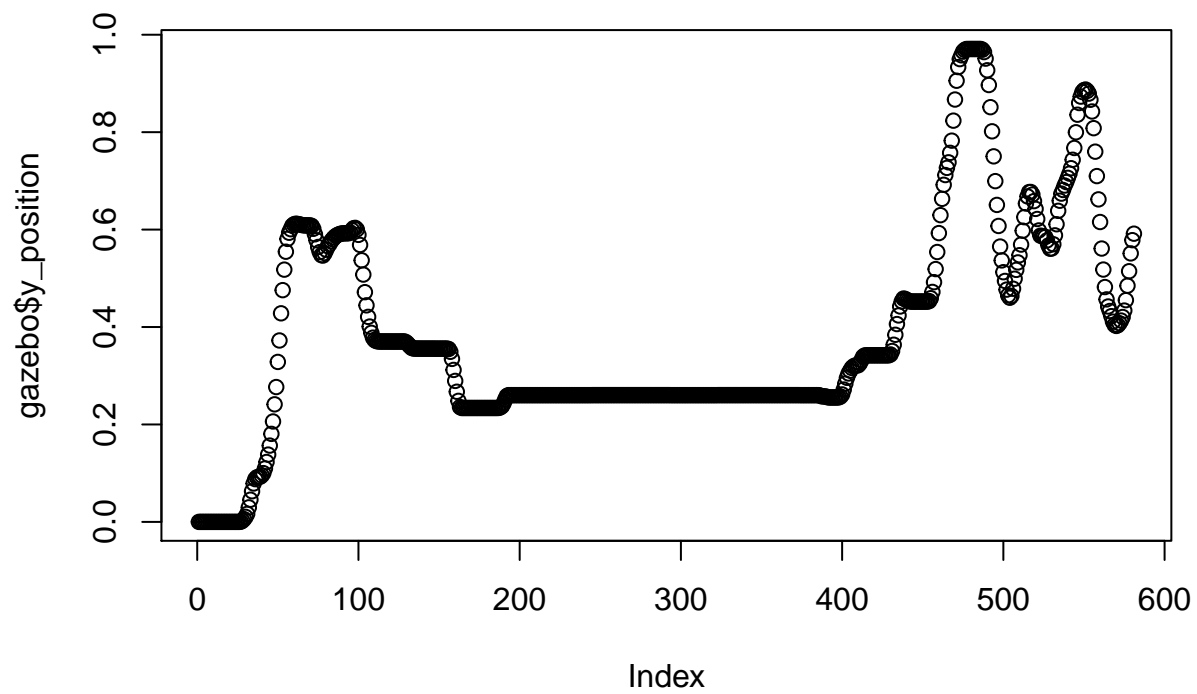
```
#sum(continuous$dist_error <= 0.25) / length(continuous$dist_error)
```

```
#sum(discrete$dist_error <= 0.25) / length(discrete$dist_error)
```

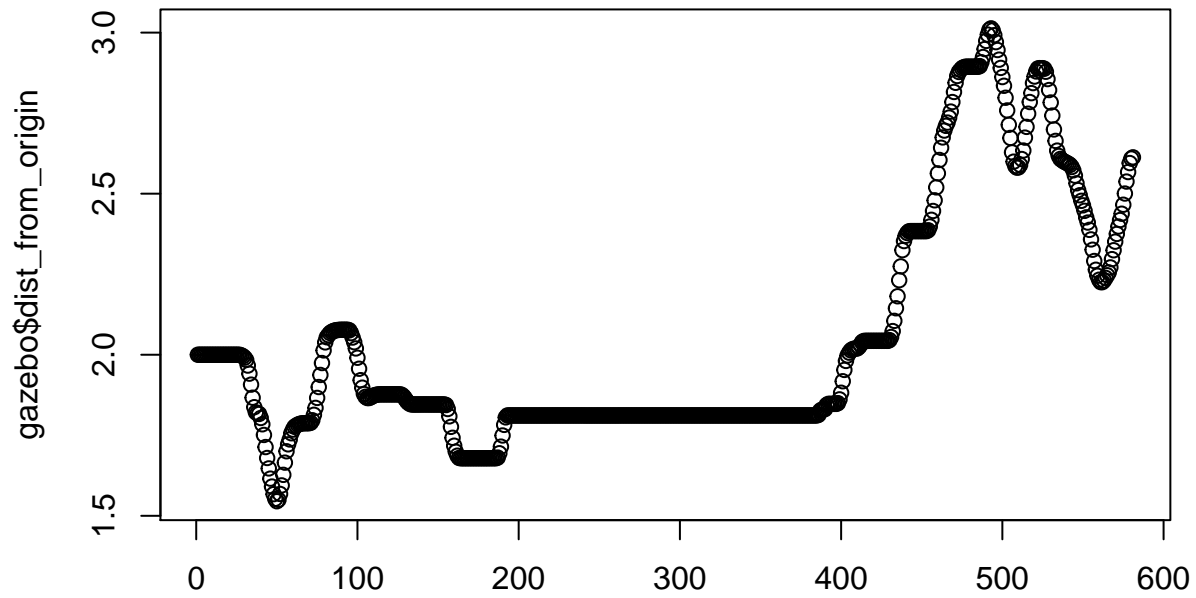
X coordinate of robot over time



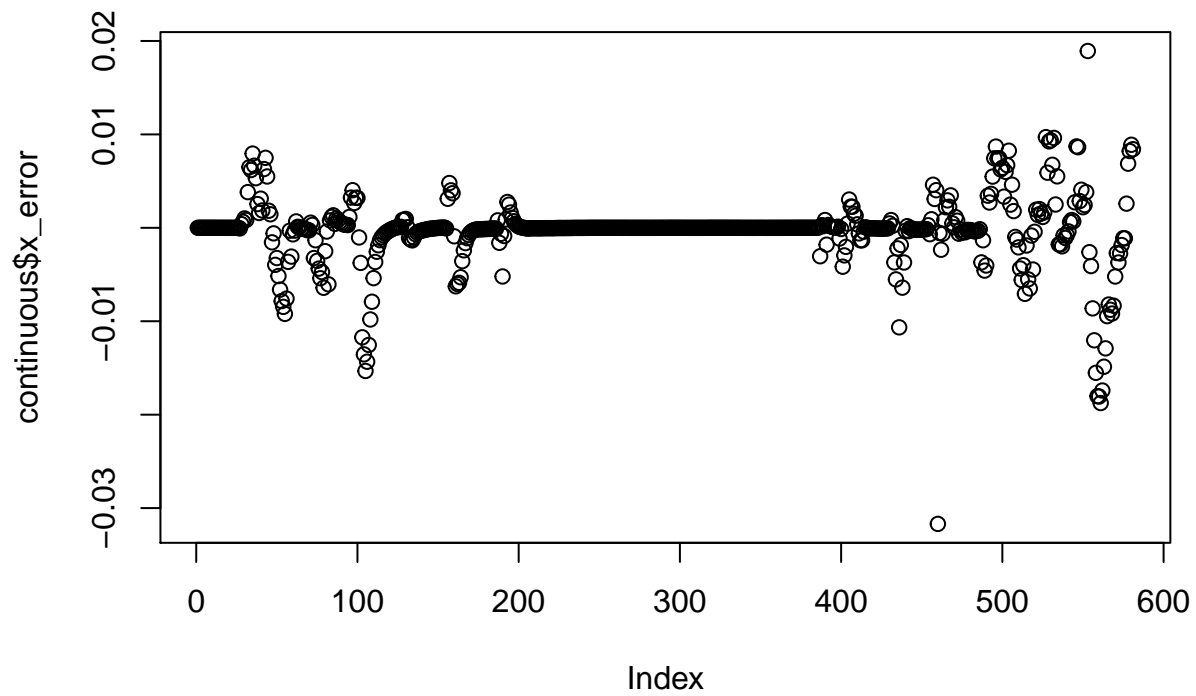
Y coordinate of robot over time



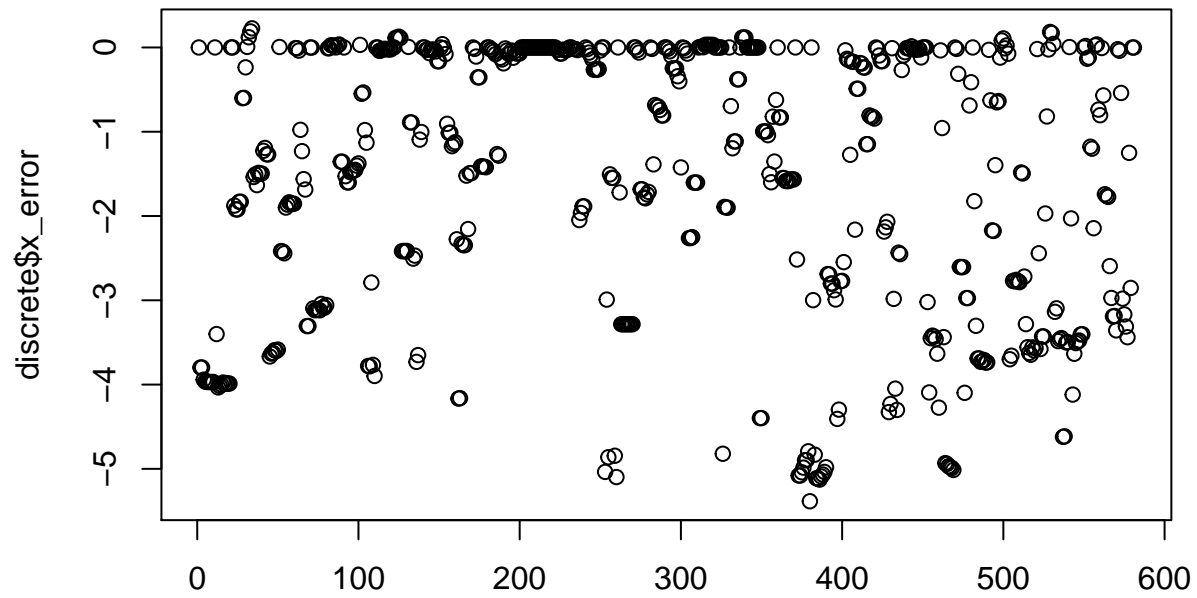
Distance from origin vs. time



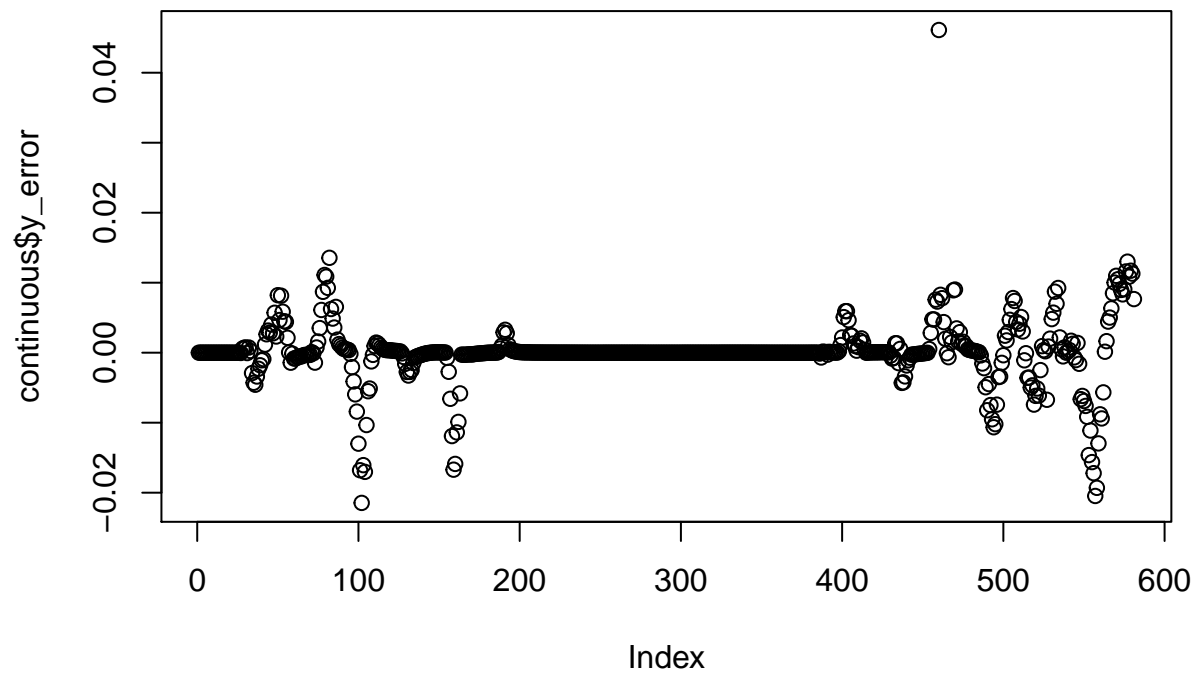
Continuous x_error over time



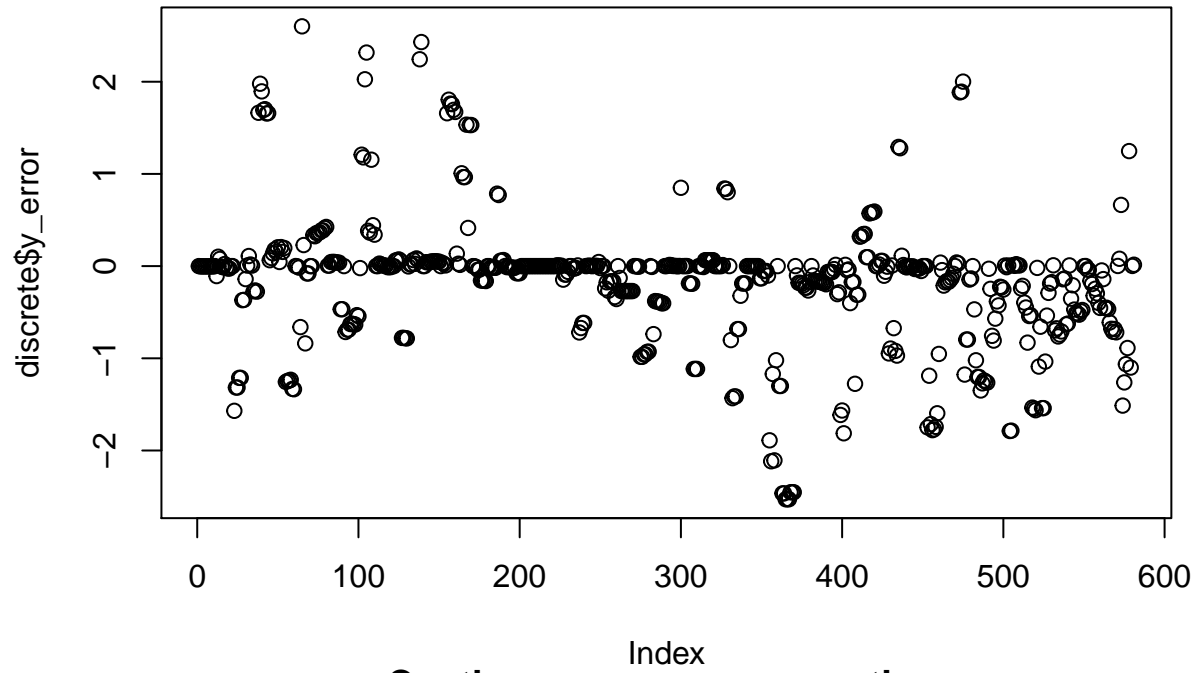
Discrete x_error over time



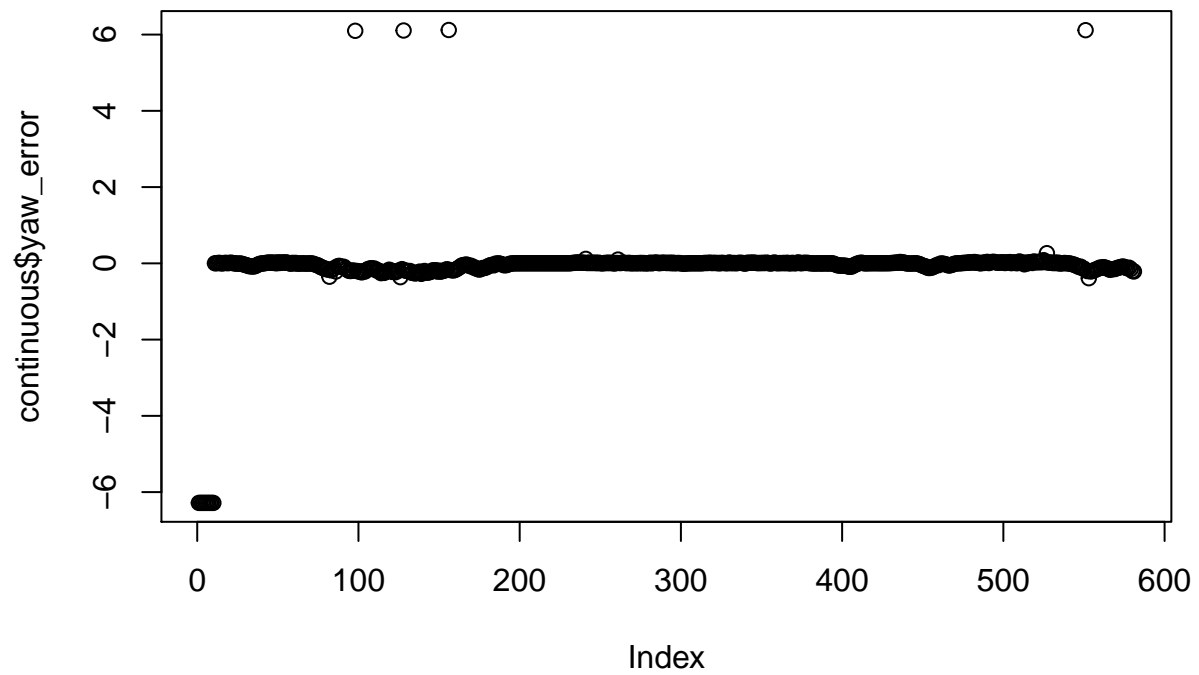
Continuous y_error over time



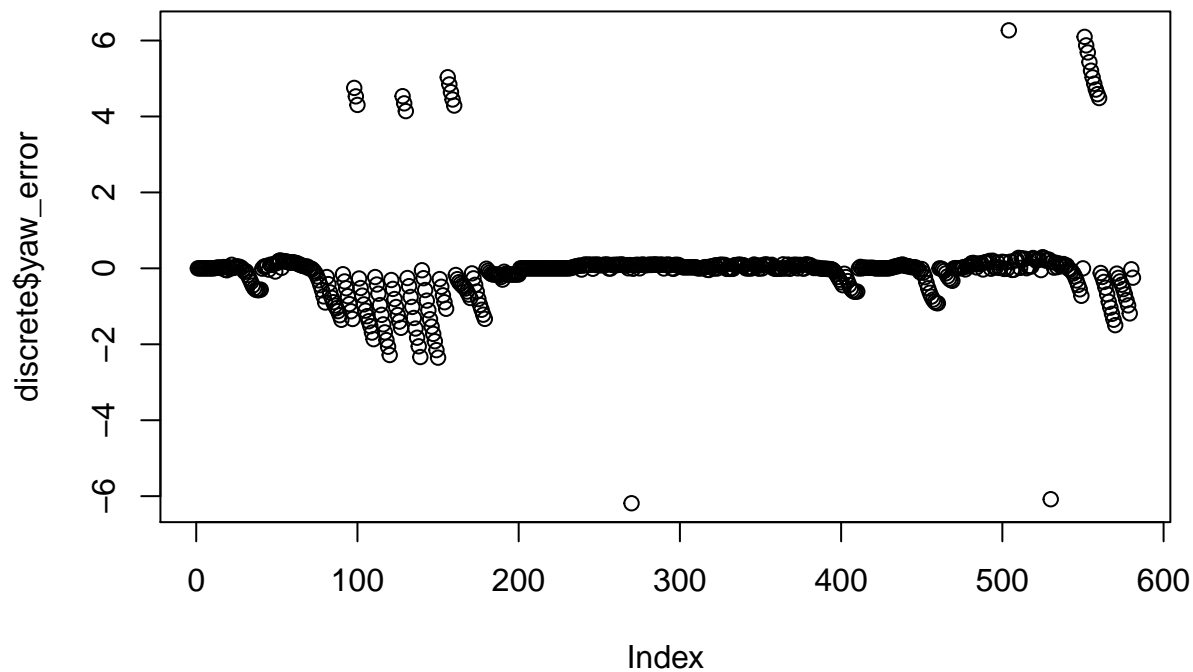
Discrete y_error over time



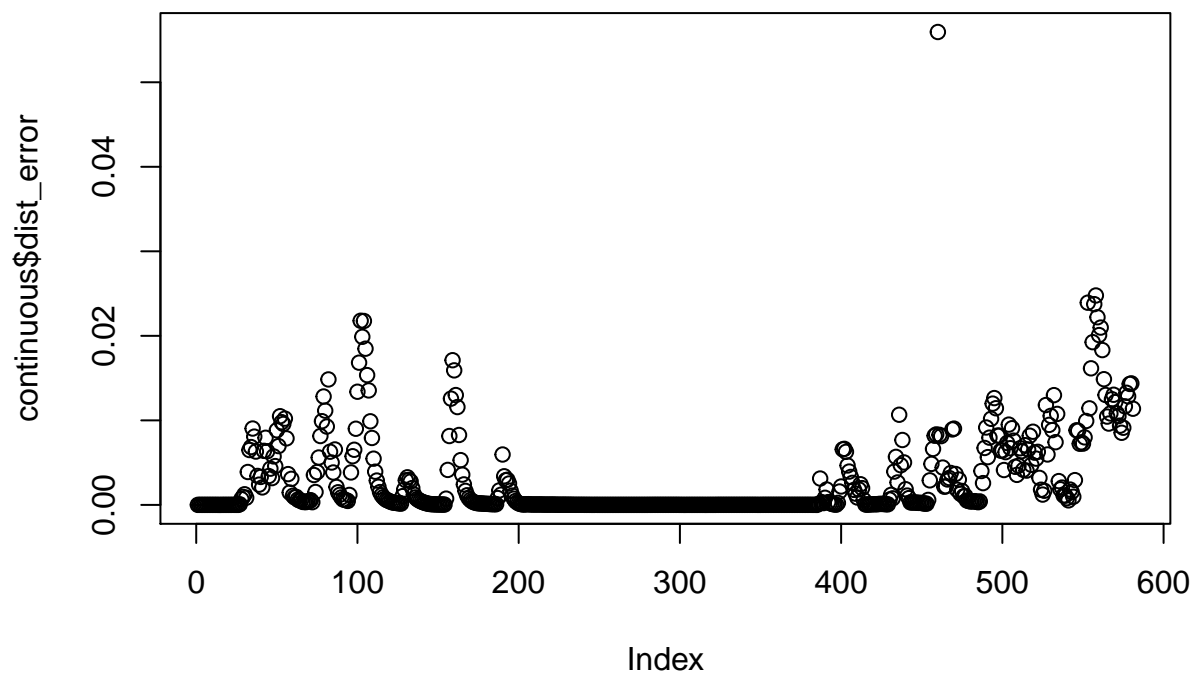
Continuous yaw error over time



Discrete yaw error over time



Continuous total distance error over time



Discrete total distance error over time

