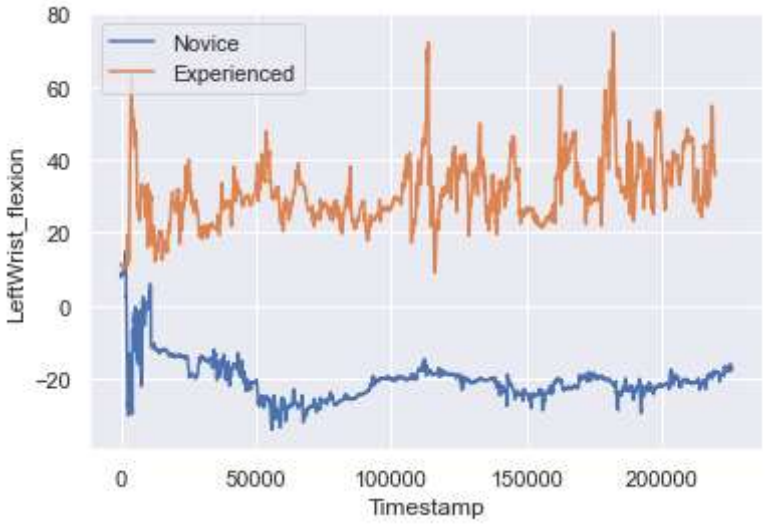
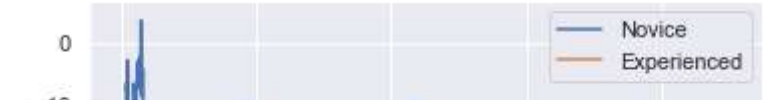
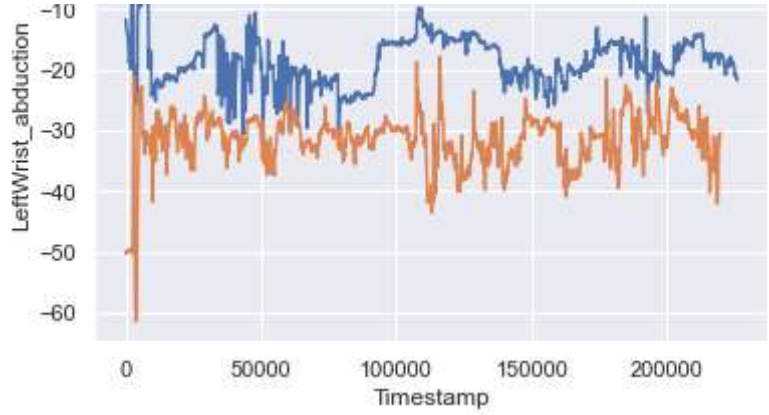
In [ ]:
```
#librarries
import pandas as pd
import numpy as np
import seaborn as sns #visualisation
import matplotlib.pyplot as plt #visualisation
%matplotlib inline
sns.set(color_codes=True)

#%pip install statannot
from statannot import add_stat_annotation

#%pip install utils
from utils import * # for some functions used in barplotify and annotatio

%pip install statannotations

from statannotations.Annotator import Annotator

from scipy import stats
from scikit_posthocs import posthoc_dunn
from scikit_posthocs import posthoc_tukey

# calculate the spearman's correlation between two variables
from numpy.random import rand
from numpy.random import seed
```

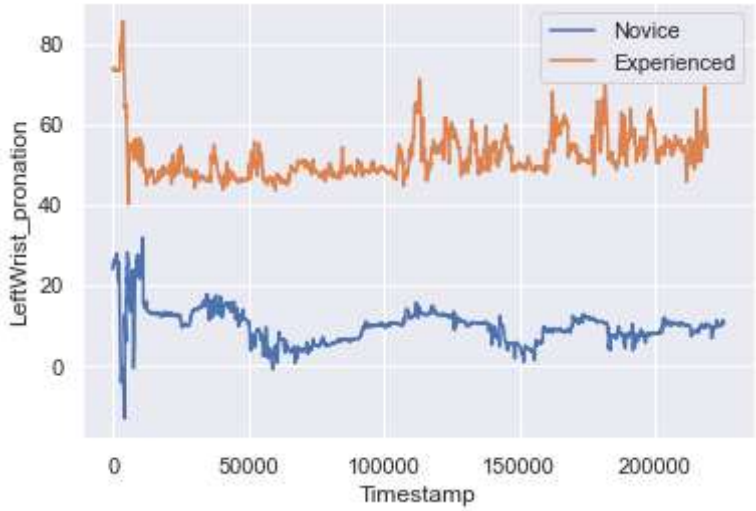
In [ ]:
```
df_ch= pd.read_csv("Christian_DEFAULT_RLH.csv")
df_dan= pd.read_csv("Daniel__DEFAULT_NYF.csv")
```

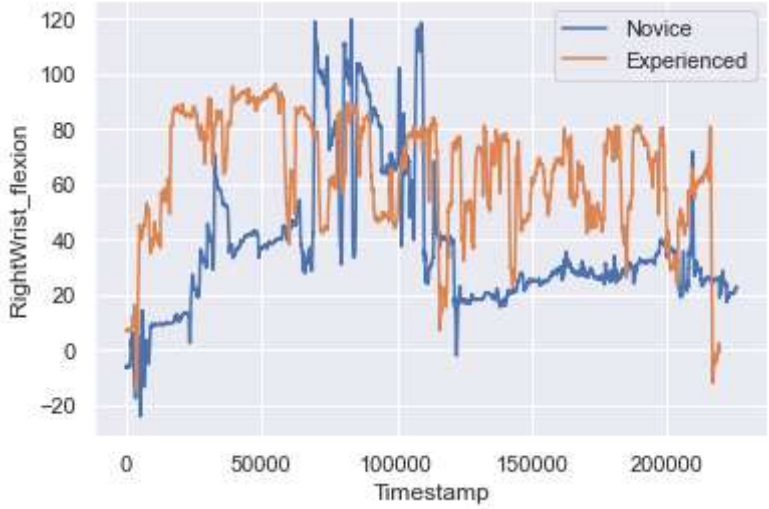
In [51]:
```
for i in [col for col in df_ch if "Wrist" in col]:

    sns.lineplot( y=df_ch[i], x= df_ch["Timestamp"], label= "Novice")
    sns.lineplot( y=df_dan[i], x= df_ch["Timestamp"] , label= "Experience
    plt.show()
```

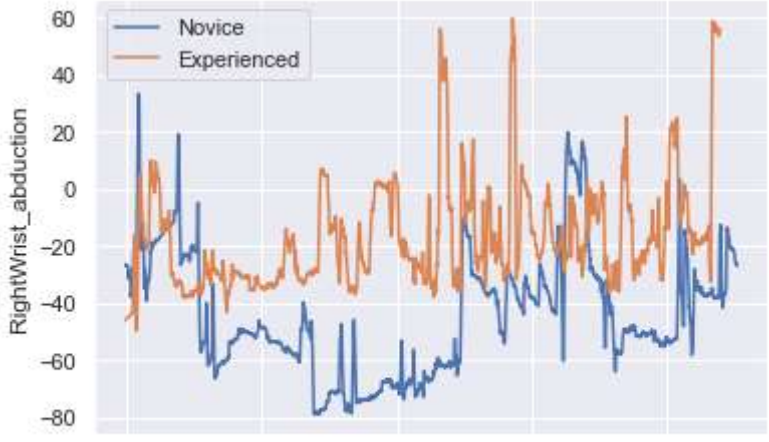


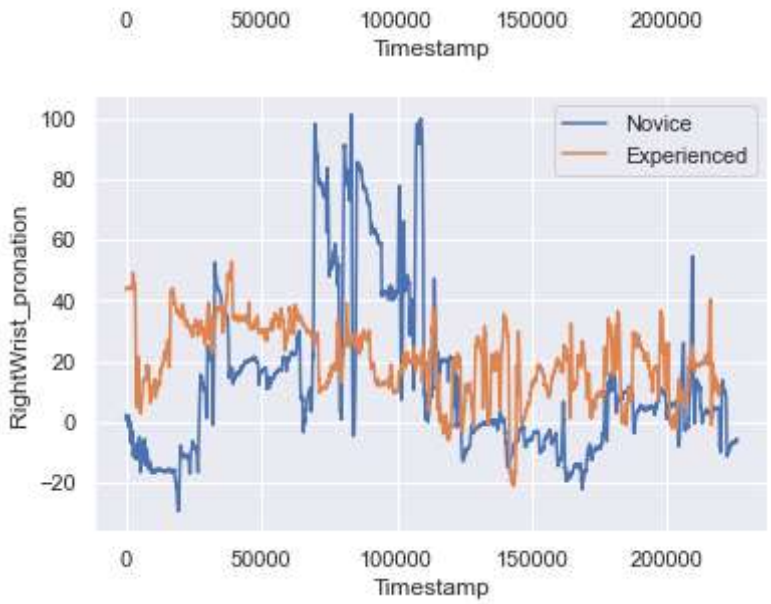



LeftWrist_abduction
−10
−20
−30
−40
−50
−60
0
50000
100000
150000
200000
Timestamp


LeftWrist_pronation
80
60
40
20
0
Novice
Experienced
0
50000
100000
150000
200000
Timestamp


RightWrist_flexion
120
100
80
60
40
20
0
−20
Novice
Experienced
0
50000
100000
150000
200000
Timestamp

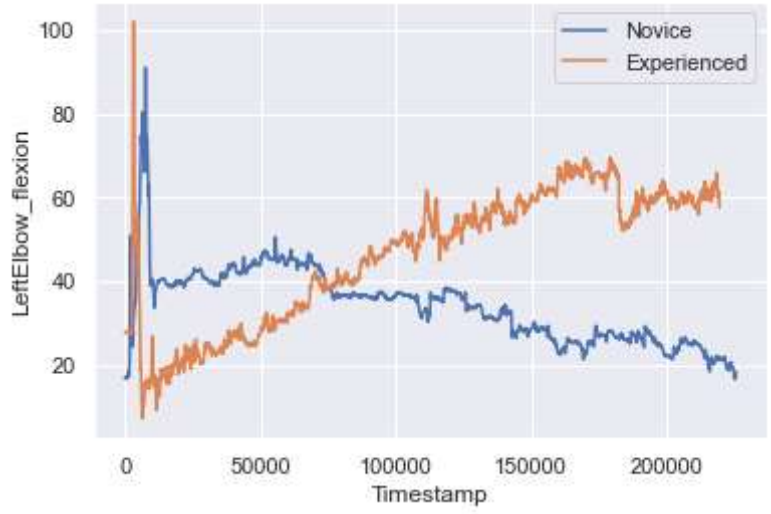

RightWrist_abduction
60
40
20
0
−20
−40
−60
−80
Novice
Experienced

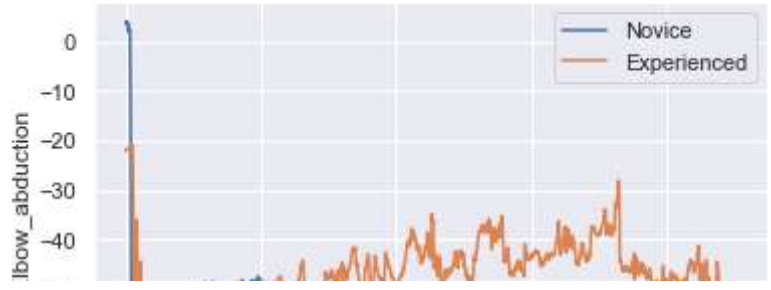


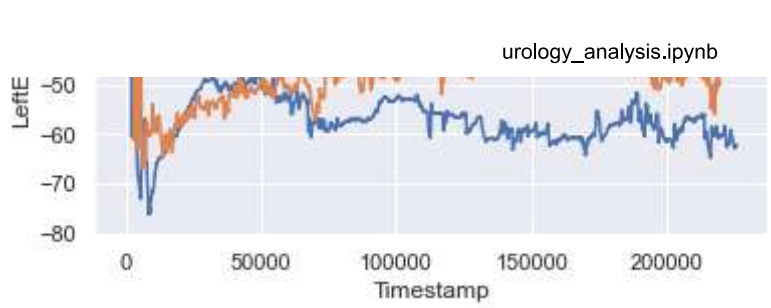
Variables

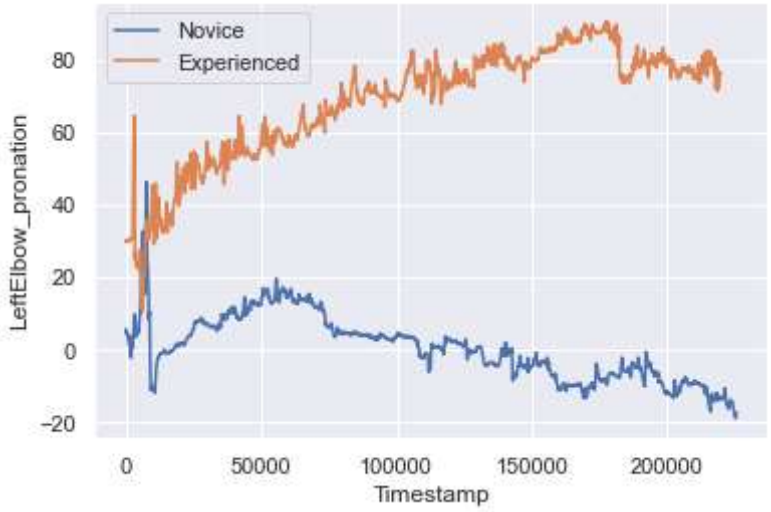
1- percentage of time when the wrist height was lower than the elbow height (PTW) 2- the height of the elbow/wrist relative to the armrest

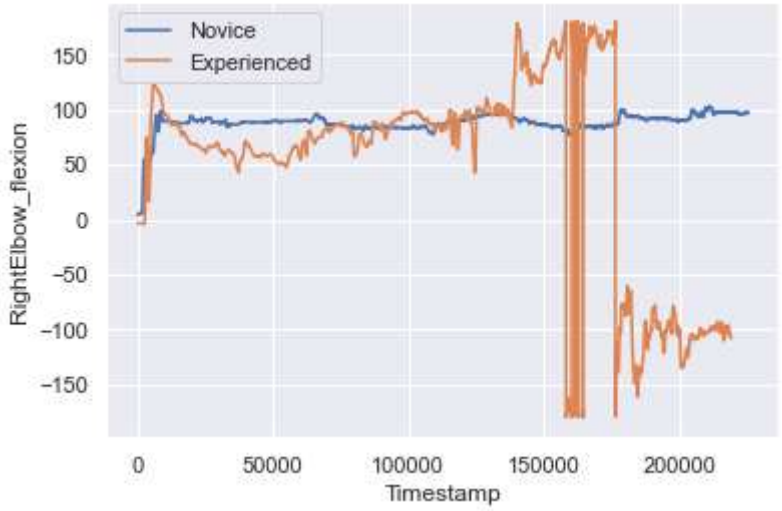
In [50]:
```
for i in [col for col in df_ch if "Elbow" in col]:

    sns.lineplot( y=df_ch[i], x= df_ch["Timestamp"], label= "Novice")
    sns.lineplot( y=df_dan[i], x= df_ch["Timestamp"] , label= "Experience
    plt.show()
```

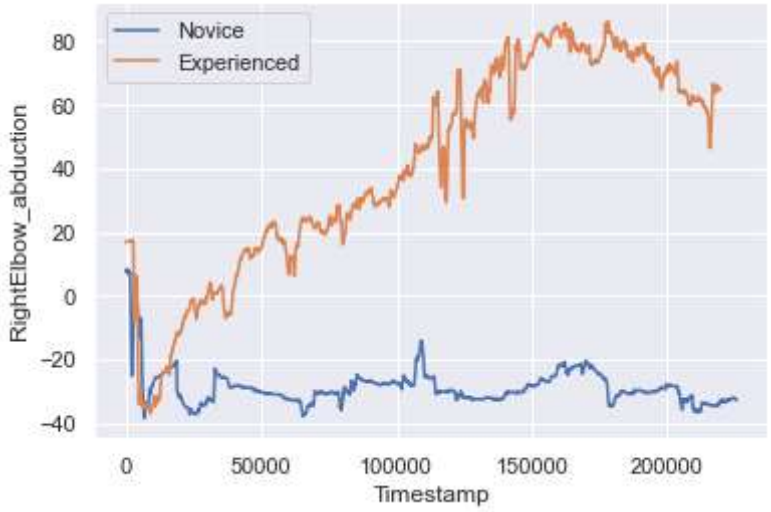




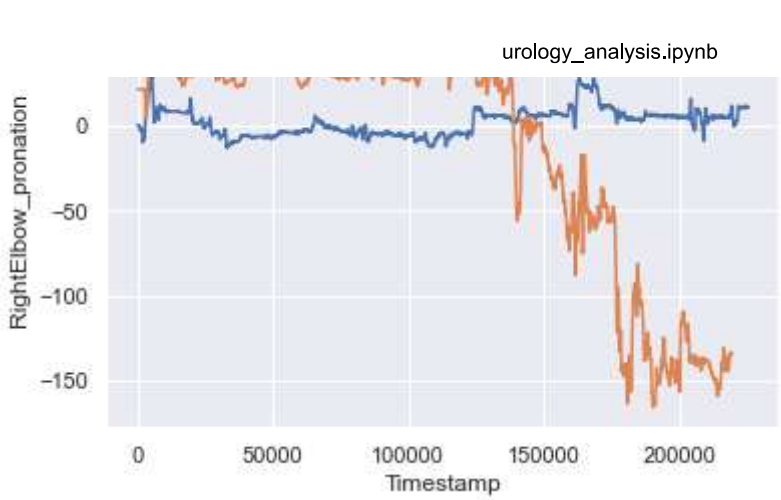

LeftE
−50
−60
−70
−80
0
50000
100000
150000
200000
Timestamp


Novice
Experienced
LeftElbow_pronation
80
60
40
20
0
−20
0
50000
100000
150000
200000
Timestamp


Novice
Experienced
RightElbow_flexion
150
100
50
0
−50
−100
−150
0
50000
100000
150000
200000
Timestamp


Novice
Experienced
RightElbow_abduction
80
60
40
20
0
−20
−40
0
50000
100000
150000
200000
Timestamp


50
Novice
Experienced


RightElbow_pronation
0
−50
−100
−150
0
50000
100000
150000
200000
Timestamp

In [ ]:

In [ ]:

In [ ]: