tuh plot

May 3, 2022

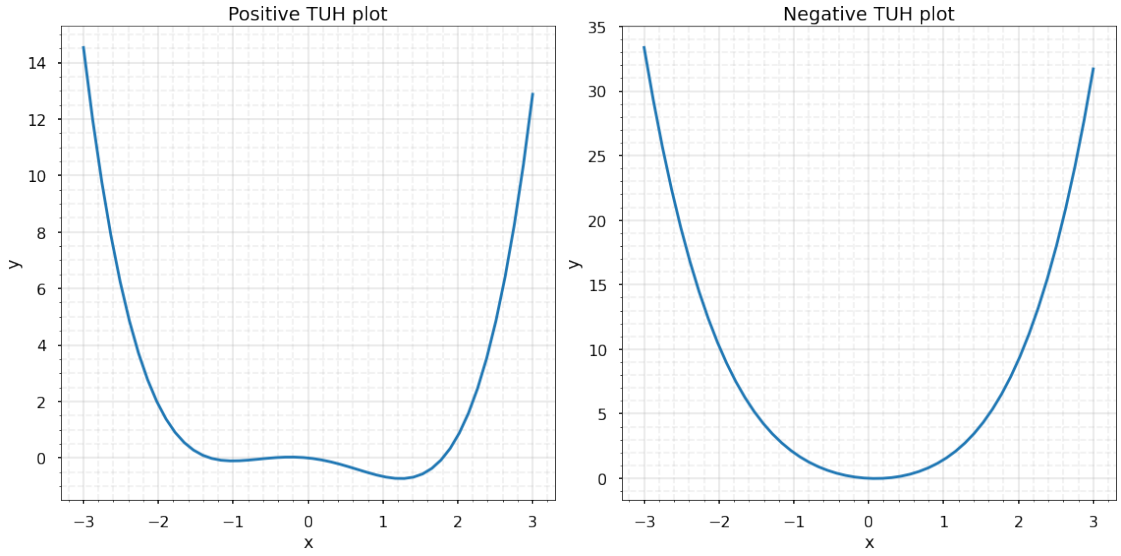
[244]:
```
# uncomment the below line to use interactive plots
# %matplotlib widget

# data maipulation
import numpy as np

# plotting tools
import matplotlib.pyplot as plt

# extra tweaks
import warnings

warnings.filterwarnings("ignore")
```

[245]:
```
fun = lambda x, t, u, h: t * (x**2) + u * (x**4) - h * x
n = 3
x = np.linspace(-n, n)
# x = np.sort(np.random.randn(n))
t_neg = np.random.uniform(-2, 0, 1)
t_pos = np.random.uniform(0, 2, 1)
u = np.random.rand(1)
h = np.random.rand(1)
```

[246]:
```
# value of y with negative t
y_neg = fun(x, t_neg, u, h)
# value of y with positive t
y_pos = fun(x, t_pos, u, h)

# printing only two values of y to make sure that positive and negative y are␣
 ↪not same.
print(f"\n t_neg = {t_neg} \n t_pos = {t_pos} \n u = {u} \n h = {h} \n \n for x␣
 ↪= {x.min():.3f} to {x.max():.3f} \n y negative = {y_neg[0:2]}\n y positive =␣
 ↪{y_pos[0:2]}")

# setting the plot
plt.style.use("seaborn-poster")
plt.figure(figsize=(16, 8))
```

```
# subplot 1 for the positive t
plt.subplot(1, 2, 1)
plt.title(f"Positive TUH plot")
plt.xlabel("x")
plt.ylabel("y")
plt.plot(x, y_neg, "-")

plt.grid(alpha=0.3, which="major")
plt.minorticks_on()
plt.grid(alpha=0.2, which="minor", ls="--")

# subplot 2 for the negative t
plt.subplot(1, 2, 2)
plt.title(f"Negative TUH plot")
plt.xlabel("x")
plt.ylabel("y")
plt.plot(x, y_pos, "-")

plt.grid(alpha=0.3, which="major")
plt.minorticks_on()
plt.grid(alpha=0.2, which="minor", ls="--")

# printing the plot
plt.tight_layout()
plt.show()
```

```
t_neg = [-0.61860109]
t_pos = [1.47481249]
u = [0.23792469]
h = [0.27581505]

for x = -3.000 to 3.000
y negative = [14.53193519 11.98438692]
y positive = [33.37265741 29.31847913]
```


Positive TUH plot
Negative TUH plot
x
y