



Continuous Error Bands in Python

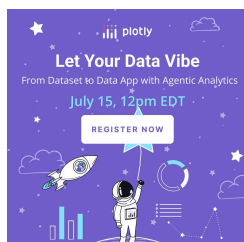
Add continuous error bands to charts in Python with Plotly.

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Continuous error bands are a graphical representation of error or uncertainty as a shaded region around a main trace, rather than as discrete whisker-like error bars. They can be implemented in a manner similar to [filled area plots \(/python/filled-area-plots/\)](#) using scatter traces with the fill attribute.

Filling within a single trace

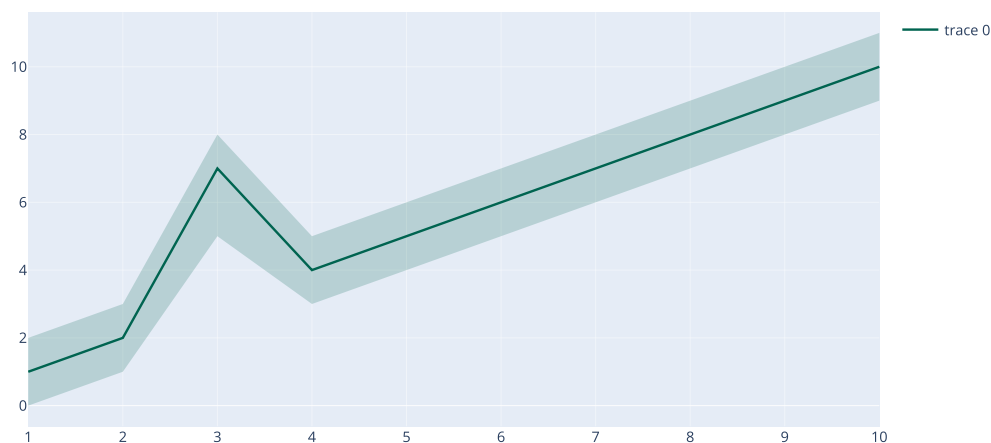
In this example we show how to construct a trace that goes from low to high X values along the upper Y edge of a region, and then from high to low X values along the lower Y edge of the region. This trace is then 'self-filled' using fill='toself'.



```
import plotly.graph_objs as go

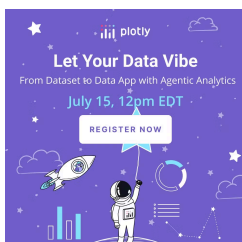
x = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
y = [1, 2, 7, 4, 5, 6, 7, 8, 9, 10]
y_upper = [2, 3, 8, 5, 6, 7, 8, 9, 10, 11]
y_lower = [0, 1, 5, 3, 4, 5, 6, 7, 8, 9]

fig = go.Figure([
    go.Scatter(
        x=x,
        y=y,
        line=dict(color='rgb(0,100,80)'),
        mode='lines'
    ),
    go.Scatter(
        x=x+x[::-1], # x, then x reversed
        y=y_upper+y_lower[::-1], # upper, then Lower reversed
        fill='toself',
        fillcolor='rgba(0,100,80,0.2)',
        line=dict(color='rgba(255,255,255,0)'),
        hoverinfo="skip",
        showlegend=False
    )
])
fig.show()
```



Filling between two traces

In this example we show how to construct the bounds of the band using two traces, with the lower trace using `fill='tonexty'` to fill an area up to the upper trace.



```

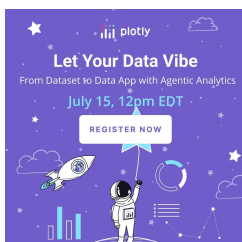
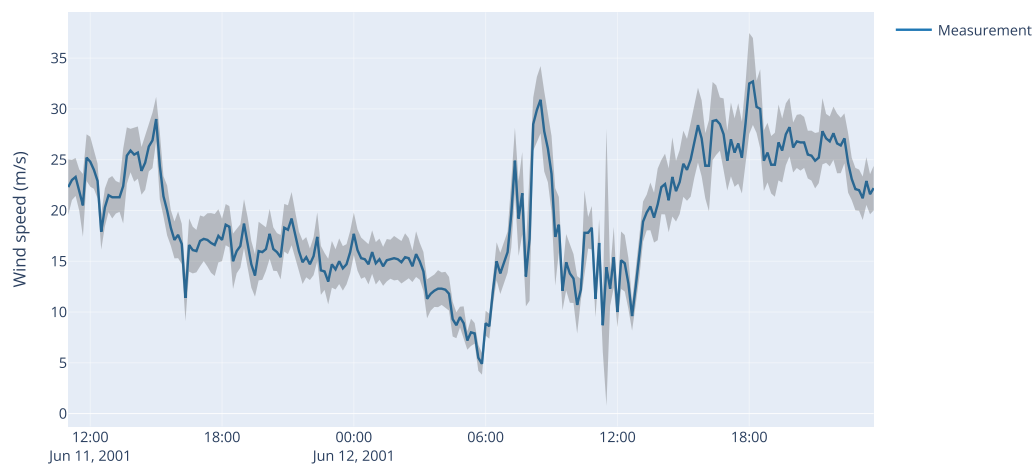
import plotly.graph_objs as go
import pandas as pd

df = pd.read_csv('https://raw.githubusercontent.com/plotly/datasets/master/wind_speed_laurel_nebraska.csv')

fig = go.Figure([
    go.Scatter(
        name='Measurement',
        x=df['Time'],
        y=df['10 Min Sampled Avg'],
        mode='lines',
        line=dict(color='rgb(31, 119, 180)'),
    ),
    go.Scatter(
        name='Upper Bound',
        x=df['Time'],
        y=df['10 Min Sampled Avg']+df['10 Min Std Dev'],
        mode='lines',
        marker=dict(color="#444"),
        line=dict(width=0),
        showlegend=False
    ),
    go.Scatter(
        name='Lower Bound',
        x=df['Time'],
        y=df['10 Min Sampled Avg']-df['10 Min Std Dev'],
        marker=dict(color="#444"),
        line=dict(width=0),
        mode='lines',
        fillcolor='rgba(68, 68, 68, 0.3)',
        fill='tonexty',
        showlegend=False
    )
])
fig.update_layout(
    yaxis=dict(title=dict(text='Wind speed (m/s)'),
    title=dict(text='Continuous, variable value error bars',
    hovermode="x"
)
)
fig.show()

```

Continuous, variable value error bars



What About Dash?

[Dash \(https://dash.plot.ly/\)](https://dash.plot.ly/) is an open-source framework for building analytical applications, with no Javascript required, and it is tightly integrated with the Plotly graphing library.

Learn about how to install Dash at <https://dash.plot.ly/installation> (https://dash.plot.ly/installation).


Everywhere in this page that you see `fig.show()`, you can display the same figure in a Dash application by passing it to the `figure` argument of the [Graph component](https://dash.plot.ly/dash-core-components/graph) (https://dash.plot.ly/dash-core-components/graph) from the built-in `dash_core_components` package like this:

```
import plotly.graph_objects as go # or plotly.express as px
fig = go.Figure() # or any Plotly Express function e.g. px.bar(...)
# fig.add_trace( ... )
# fig.update_layout( ... )

from dash import Dash, dcc, html

app = Dash()
app.layout = html.Div([
    dcc.Graph(figure=fig)
])

app.run(debug=True, use_reloader=False) # Turn off reloader if inside Jupyter
```



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pop

lifeExp

gdpPerCap

country	pop	continent	lifeExp	gdpPerCap
Afghanistan	31889923	Asia	43.828	974.5883384
Albania	3600523	Europe	76.423	5937.829525999999
Algeria	33333216	Africa	72.381	6223.367465
Angola	12420476	Africa	42.731	4707.231267
Argentina	40301927	Americas	75.32	12779.37964
Australia	20434176	Oceania	81.235	34435.367439999995
Austria	8199783	Europe	79.829	36126.4927
Bahrain	706573	Asia	75.635	29796.04834
Bangladesh	150448339	Asia	64.062	1701.253792
Belgium	10391226	Europe	79.441	33062.04908
Benin	8878314	Africa	56.728	1441.284873
Bolivia	9139152	Americas	65.554	3821.137884



(https://dash.plotly.com/tutorial?utm_medium=graphing_libraries&utm_content=python_footer)

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