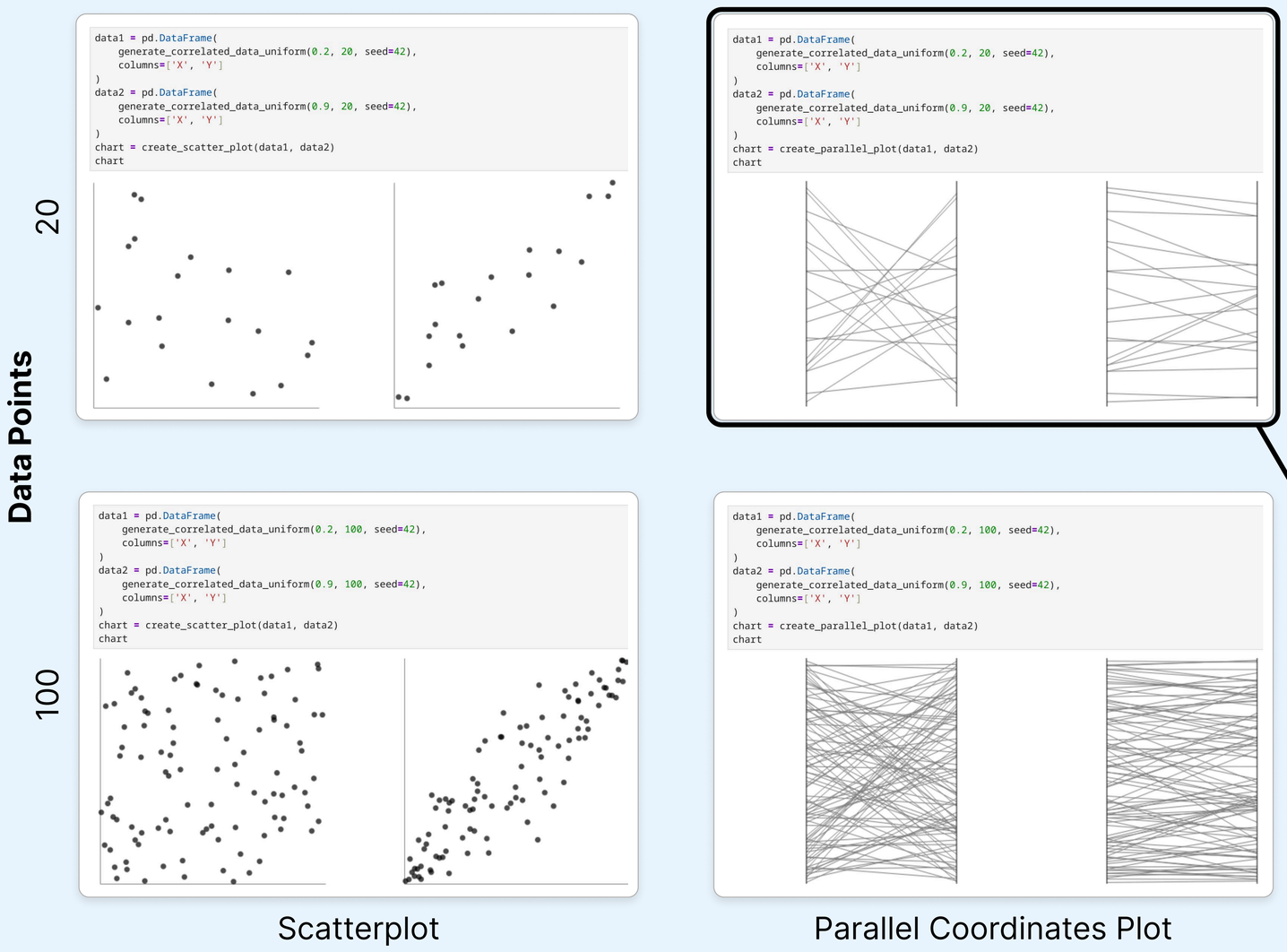
ReVISitPy: Python Bindings for the reVISit Study Framework

H. Shrestha, J. Wilburn, B. Bollen, A. M. McNutt, A. Lex, L. Harrison

revisit.dev

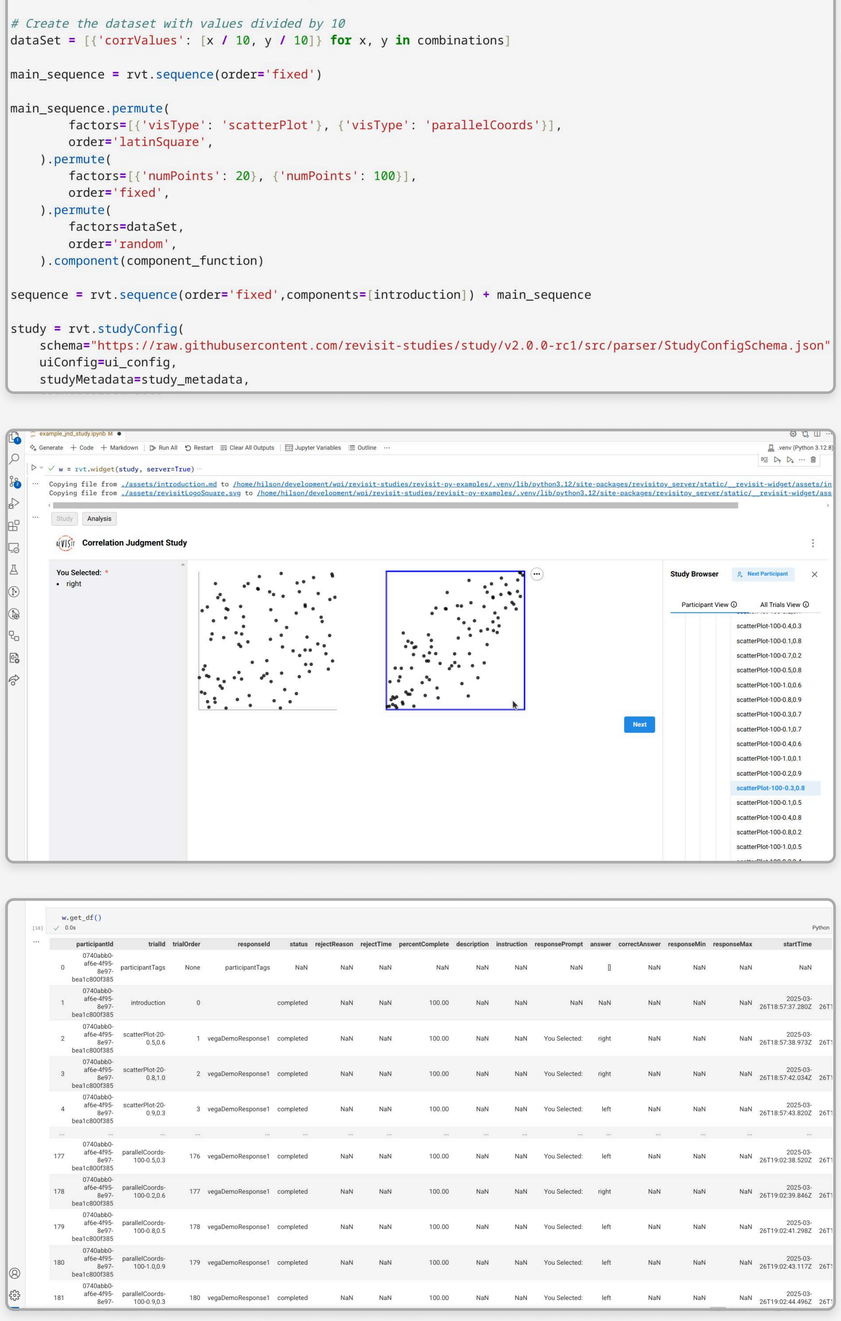
ReVISitPy is a Python package that enables experiment designers to **create and test visualization studies** with potentially **enormous configuration files** for the reVISit study framework.



~232,000 lines of code for the entire study!

```
import itertools

# Generate all combinations of two values between 1 and 10
combinations = itertools.combinations(range(1, 11), 2)

# Create the dataset with values divided by 10
dataSet = [{'corrValues': [x / 10, y / 10]} for x, y in combinations]

main_sequence = rvt.sequence(order='fixed')

main_sequence.permute(
        factors=[{'visType': 'scatterPlot'}, {'visType': 'parallelCoords'}],
        order='latinSquare',
    ).permute(
        factors=[{'numPoints': 20}, {'numPoints': 100}],
        order='fixed',
    ).permute(
        factors=dataSet,
        order='random',
    ).component(component_function)

sequence = rvt.sequence(order='fixed',components=[introduction]) + main_sequence

study = rvt.studyConfig(
    schema="https://raw.githubusercontent.com/revisit-studies/study/v2.0.0-rc1/src/parser/StudyConfigSchema.json"
    uiConfig=ui_config,
    studyMetadata=study_metadata,
```

A Create reVISit specification



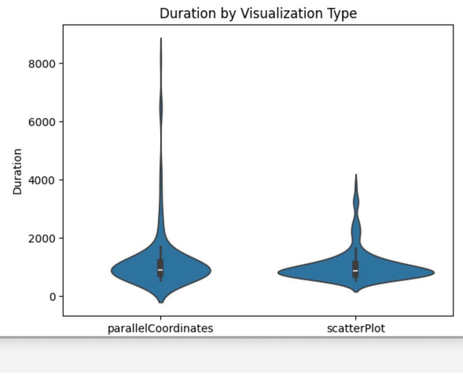
B Preview study in the anyWidget powered reVISit interface

```
w.get_df()
```

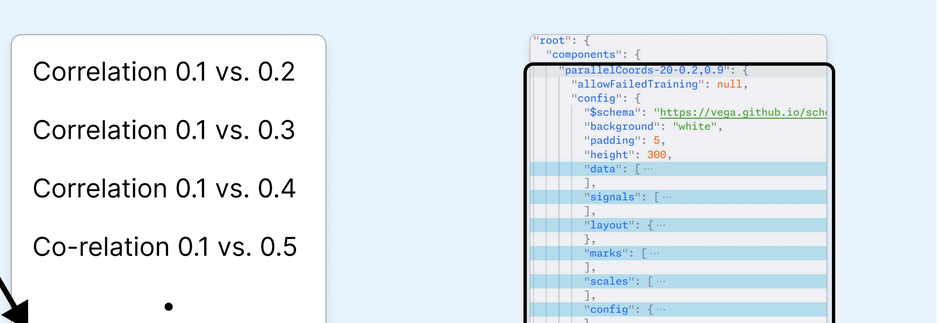
	participantId	trialId	trialOrder	responseId	status	rejectReason	rejectTime	percentComplete	description	instruction	responsePrompt	answer	correctAnswer	responseMin	responseMax	startTime
0	074dabb0-af6e-4f95-8e97-bea1c800f385	participantTags	None	participantTags	NaN	NaN	NaN	NaN	NaN	NaN	NaN	[]	NaN	NaN	NaN	NaN
1	074dabb0-af6e-4f95-8e97-bea1c800f385	introduction	0		completed	NaN	NaN	100.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	2025-03-26T18:57:37.280Z
2	074dabb0-af6e-4f95-8e97-bea1c800f385	scatterPlot-20-0.5,0.6	1	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	right	NaN	NaN	NaN	2025-03-26T18:57:38.973Z
3	074dabb0-af6e-4f95-8e97-bea1c800f385	scatterPlot-20-0.8,1.0	2	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	right	NaN	NaN	NaN	2025-03-26T18:57:42.034Z
4	074dabb0-af6e-4f95-8e97-bea1c800f385	scatterPlot-20-0.9,0.3	3	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	left	NaN	NaN	NaN	2025-03-26T18:57:43.820Z
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
177	074dabb0-af6e-4f95-8e97-bea1c800f385	parallelCoords-100-0.5,0.3	176	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	left	NaN	NaN	NaN	2025-03-26T19:02:38.520Z
178	074dabb0-af6e-4f95-8e97-bea1c800f385	parallelCoords-100-0.2,0.6	177	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	right	NaN	NaN	NaN	2025-03-26T19:02:39.846Z
179	074dabb0-af6e-4f95-8e97-bea1c800f385	parallelCoords-100-0.8,0.5	178	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	left	NaN	NaN	NaN	2025-03-26T19:02:41.298Z
180	074dabb0-af6e-4f95-8e97-bea1c800f385	parallelCoords-100-1.0,0.9	179	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	left	NaN	NaN	NaN	2025-03-26T19:02:43.117Z
181	074dabb0-af6e-4f95-8e97-	parallelCoords-100-0.9,0.3	180	vegaDemoResponse1	completed	NaN	NaN	100.00	NaN	NaN	You Selected:	left	NaN	NaN	NaN	2025-03-26T19:02:44.496Z

C Export data from reVISit's analysis interface

```
filtered_df = df[df['trialId'].str.startswith(('parallelCoords-', 'scatterPlot-'))].copy()

filtered_df['visType'] = filtered_df['trialId'].apply(
    lambda x: 'parallelCoordinates' if x.startswith('parallelCoords-')
    else 'scatterPlot' if x.startswith('scatterPlot-')
    else x
)

sns.violinplot(x='visType', y='duration', data=filtered_df)
plt.title('Duration by Visualization Type')
plt.xlabel('Visualization Type')
plt.ylabel('Duration')
plt.show()
```



D Perform preliminary analysis of the data



ReVISit is an **open-source software toolkit** and framework for creating, deploying, and monitoring user studies. Running quality empirical studies can be demanding and resource-intensive, requiring significant time, cost, and expertise. ReVISit addresses these challenges by introducing a domain-specific language for designing experiments

ReVISitPy provides easy-to-use functions for developing, testing and performing preliminary analysis of an entire studies from within a **single python notebook**.

THE UNIVERSITY OF UTAH
WPI
NSF
Award Number 2213756 & 2213757