statannotations

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CHAPTER

ONE

STATANNOTATIONS

1.1 statannotations package

1.1.1 Subpackages

statannotations.stats package

Submodules

statannotations.stats.ComparisonsCorrection module

class statannotations.stats.ComparisonsCorrection.**ComparisonsCorrection**(*method: Union[str, callable]*, *alpha: float = 0.05*, *name: Optional[str] = None*, *method_type: Optional[int] = None*, *statsmodels_api: bool = True*, *corr_kwargs: Optional[dict] = None*)

Bases: object

apply(*test_result_list*)

document(*func*)

statannotations.stats.ComparisonsCorrection.**check_valid_correction_name**(*name*)

statannotations.stats.ComparisonsCorrection.**get_correction_parameters**(*name*)

statannotations.stats.ComparisonsCorrection.**get_validated_comparisons_correction**(*comparisons_correction*)

statannotations.stats.StatResult module

class statannotations.stats.StatResult.**StatResult**(*test_description*, *test_short_name*, *stat_str*, *stat*, *pval*, *alpha=0.05*)

Bases: object

adjust(*stat_summary*)

property corrected_significance

property correction_method

property formatted_output

property significance_suffix

statannotations.stats.StatTest module

class statannotations.stats.StatTest.**StatTest**(*func: Callable*, *test_long_name: str*, *test_short_name: str*, *stat_name: str = 'Stat'*, *alpha: float = 0.05*, **args*, ***kwargs*)

Bases: object

static from_library(*test_name: str*) → *StatTest*

property short_name

statannotations.stats.StatTest.**wilcoxon**(*group_data1*, *group_data2*, *verbose=1*, ***stats_params*)

This function provides the equivalent behavior from earlier versions of statannot/statannotations.

statannotations.stats.test module

statannotations.stats.test.**apply_test**(*group_data1*, *group_data2*, *test: Optional[Union[StatTest, str]] = None*, *comparisons_correction: Optional[Union[ComparisonsCorrection, str]] = None*, *num_comparisons: int = 1*, *alpha: float = 0.05*, ***stats_params*)

Get formatted result of two-sample statistical test.

Parameters

- **group_data1** – data
- **group_data2** – data
- **test** – Union[StatTest, str]: Statistical test to run. Either a *StatTest* instance or one of: - *Brunner-Munzel - Levene - Mann-Whitney - Mann-Whitney-gt - Mann-Whitney-ls - t-test_ind - t-test_welch - t-test_paired - Wilcoxon - Kruskal*
- **comparisons_correction** – Union[ComparisonsCorrection, str]: (Default value = None) Method to use for multiple comparisons correction. Either a *ComparisonsCorrection* instance or one of (interfacing statsmodels): - Bonferroni - Holm-Bonferroni - Benjamini-Hochberg - Benjamini-Yekutieli
- **num_comparisons** – int: (Default value = 1) Number of comparisons to use for multiple comparisons correction.

- **alpha** – float: (Default value = 0.05) Used for pvalue interpretation in case of comparisons_correction.
- **stats_params** – Additional keyword arguments to pass to the test function

statannotations.stats.utils module

statannotations.stats.utils.**check_alpha**(*alpha*)

statannotations.stats.utils.**check_num_comparisons**(*num_comparisons*)

statannotations.stats.utils.**check_pvalues**(*p_values*)

statannotations.stats.utils.**get_num_comparisons**(*p_values*, *num_comparisons*)

statannotations.stats.utils.**return_results**(*results_array*)

Module contents

1.1.2 Submodules

1.1.3 statannotations.Annotation module

class statannotations.Annotation.**Annotation**(*structs*, *data: Union[str,* StatResult*]*, *formatter: Optional[*Formatter*] = None*)

Bases: object

Holds data, linked structs and an optional Formatter.

property formatted_output

print_labels_and_content(*sep=' vs. '*)

property text

1.1.4 statannotations.Annotator module

class statannotations.Annotator.**Annotator**(*ax*, *pairs*, *plot='boxplot'*, *data=None*, *x=None*, *y=None*, *hue=None*, *order=None*, *hue_order=None*, *engine='seaborn'*, *verbose=True*, ***plot_params*)

Bases: object

Optionally computes statistical test between pairs of data series, and add statistical annotation on top of the groups (boxes, bars…). The same exact arguments provided to the seaborn plotting function must be passed to the constructor.

This Annotator works in one of the three following modes:

- Add custom text annotations (*set_custom_annotations*)
- Format pvalues and add them to the plot (*set_pvalues*)
- **Perform a statistical test and then add the results to the plot** (*apply_test*)

property alpha

annotate(*line_offset=None*, *line_offset_to_group=None*)

Add configured annotations to the plot.

annotate_custom_annotations(*text_annot_custom*)

Parameters

text_annot_custom – List of strings to annotate for each *pair*

apply_and_annotate()

Applies a configured statistical test and annotates the plot

apply_test(*num_comparisons='auto'*, ***stats_params*)

Parameters

- **stats_params** – Parameters for statistical test functions.
- **num_comparisons** – Override number of comparisons otherwise calculated with number of pairs

property comparisons_correction

configure(***parameters*)

- *alpha*: Acceptable type 1 error for statistical tests, default 0.05
- *color*
- ***comparisons_correction*: Method for multiple comparisons correction.**
  One of *statsmodels multipletests* methods (w/ default FWER), or a *ComparisonsCorrection* instance.
- ***correction_format*: How to format the star notation on the plot when**
  the multiple comparisons correction method removes the significance * *default*: a ' (ns)' suffix is added, such as in printed output, corresponds to "{star} ({suffix})" * *replace*: the original star value is replaced with 'ns' corresponds to "{suffix}" * a custom formatting string using "{star}" for the original pvalue and '{suffix}' for 'ns'
- *line_height*: in axes fraction coordinates
- *line_offset*
- *line_offset_to_group*
- *line_width*
- *loc*
- ***pvalue_format*: list of lists, or tuples. Default values are:**
  - For "star" text_format: *[[1e-4, "****"], [1e-3, "***"], [1e-2, "**"], [0.05, "*"], [1, "ns"]]*.
  - For "simple" text_format: *[[1e-5, "1e-5"], [1e-4, "1e-4"], [1e-3, "0.001"], [1e-2, "0.01"], [5e-2, "0.05"]]*.
- ***show_test_name*: Set to False to not show the (short) name of**
  test
- *test*
- *text_offset*: in points
- *test_short_name*

- *use_fixed_offset*
- *verbose*

property fig

get_annotations_text()

get_configuration()

static get_empty_annotator()

This instance will have to be initialized with *new_plot()* before being used. This behavior can be useful to create an Annotator before using it in a *FacetGrid* mapping.

classmethod get_offset_func(*position*)

has_type0_comparisons_correction()

property loc

new_plot(*ax*, *pairs=None*, *plot='boxplot'*, *data=None*, *x=None*, *y=None*, *hue=None*, *order=None*, *hue_order=None*, *engine: str = 'seaborn'*, ***plot_params*)

property orient

static plot_and_annotate(*plot: str*, *pairs: list*, *plot_params: dict*, *configuration: dict*, *annotation_func: str*, *annotation_params: Optional[dict] = None*, *ax_op_before: Optional[List[Union[str, list, None, dict]]] = None*, *ax_op_after: Optional[List[Union[str, list, None, dict]]] = None*, *annotate_params: Optional[dict] = None*)

Plots using seaborn and annotates in a single call.

Parameters

- **plot** – seaborn plotting function to call
- **pairs** – pairs to compare (see Annotator)
- **plot_params** – parameters for plotting function call
- **configuration** – parameters for Annotator.configure
- **annotation_func** – name of annotation function to be called, from: * 'set_custom_annotations' * 'set_pvalues' * 'apply_test'
- **annotation_params** – parameters for the annotation function
- **ax_op_before** – list of [func_name, args, kwargs] to apply on *ax* before annotating
- **ax_op_after** – list of [func_name, args, kwargs] to apply on *ax* after annotating
- **annotate_params** – parameters for *Annotator.annotate*

plot_and_annotate_facets(*plot: str*, *plot_params: dict*, *configuration: dict*, *annotation_func: str*, **args*, *annotation_params: Optional[dict] = None*, *ax_op_before: Optional[List[Union[str, list, None, dict]]] = None*, *ax_op_after: Optional[List[Union[str, list, None, dict]]] = None*, *annotate_params: Optional[dict] = None*, ***kwargs*)

Plots using seaborn and annotates in a single call, to be used within a *FacetGrid*. First, initialize the Annotator with *Annotator(None, pairs)* to define the pairs, then map this function onto the *FacetGrid*.

Parameters

- **plot** – seaborn plotting function to call
- **plot_params** – parameters for plotting function call
- **configuration** – parameters for Annotator.configure
- **annotation_func** – name of annotation function to be called, from: * 'set_custom_annotations' * 'set_pvalues' * 'apply_test'
- **annotation_params** – parameters for the annotation function
- **ax_op_before** – list of [func_name, args, kwargs] to apply on *ax* before annotating
- **ax_op_after** – list of [func_name, args, kwargs] to apply on *ax* after annotating
- **annotate_params** – parameters for *Annotator.annotate*
- **args** – additional parameters for the seaborn function
- **kwargs** – additional parameters for the seaborn function

print_pvalue_legend()

property pvalue_format

reset_configuration()

set_custom_annotations(*text_annot_custom*)

Parameters
text_annot_custom – List of strings to annotate for each *pair*

set_pvalues(*pvalues*, *num_comparisons='auto'*)

Parameters

- **pvalues** – list or array of p-values for each pair comparison.
- **num_comparisons** – Override number of comparisons otherwise calculated with number of pairs

set_pvalues_and_annotate(*pvalues*, *num_comparisons='auto'*)

property test

validate_test_short_name()

property verbose

1.1.5 statannotations.PValueFormat module

class statannotations.PValueFormat.**Formatter**

Bases: object

config(**args*, ***kwargs*)

format_data(*data*)

class statannotations.PValueFormat.**PValueFormat**

Bases: *Formatter*

config(***parameters*)

property correction_format

format_data(*result*)

get_configuration()

print_legend_if_used()

property pvalue_format_string

property pvalue_thresholds

property simple_format_string

property text_format

statannotations.PValueFormat.**get_corrected_star**(*star: str*, *res:* StatResult, *correction_format='{star} ({suffix})'*) → str

statannotations.PValueFormat.**sort_pvalue_thresholds**(*pvalue_thresholds*)

1.1.6 statannotations.format_annotations module

statannotations.format_annotations.**pval_annotation_text**(*result: List[*StatResult*]*, *pvalue_thresholds: List*) → List[tuple]

Parameters

- **result** – StatResult instance or list thereof
- **pvalue_thresholds** – thresholds to use for formatter

Returns
A List of rendered annotations if a list of StatResults was provided, a string otherwise.

statannotations.format_annotations.**simple_text**(*result:* StatResult, *pvalue_format*, *pvalue_thresholds*, *short_test_name=True*) → str

Generates simple text for test name and pvalue.

Parameters

- **result** – StatResult instance
- **pvalue_format** – format string for pvalue
- **pvalue_thresholds** – String to display per pvalue range
- **short_test_name** – whether to display the test (short) name

Returns
simple annotation

1.1.7 statannotations.utils module

exception statannotations.utils.**InvalidParametersError**(*parameters*)

Bases: Exception

statannotations.utils.**check_is_in**(*x*, *valid_values*, *error_type=<class 'ValueError'>*, *label=None*)

Raise an error if x is not in valid_values.

statannotations.utils.**check_not_none**(*name*, *value*)

statannotations.utils.**check_order_in_data**(*data*, *x*, *order*) → None

statannotations.utils.**check_pairs_in_data**(*pairs: Union[list, tuple]*, *data: Optional[Union[List[list], DataFrame]] = None*, *coord: Optional[Union[str, list]] = None*, *hue: Optional[str] = None*, *hue_order: Optional[List[str]] = None*)

Checks that values referred to in *order* and *pairs* exist in data.

statannotations.utils.**check_valid_text_format**(*text_format*)

statannotations.utils.**empty_dict_if_none**(*data*)

statannotations.utils.**get_closest**(*a_list*, *value*)

Assumes myList is sorted. Returns closest value to myNumber. If two numbers are equally close, return the smallest number. from https://stackoverflow.com/a/12141511/9981846

statannotations.utils.**get_x_values**(*data*, *x*) → set

statannotations.utils.**raise_expected_got**(*expected*, *for_*, *got*, *error_type=<class 'ValueError'>*)

Raise a standardized error message.

Raise an *error_type* error with the message
Expected *expected* for *for_*; got *got* instead.

Or, if *for_* is *None*,
Expected *expected*; got *got* instead.

statannotations.utils.**remove_null**(*series*)

statannotations.utils.**render_collection**(*collection*)

1.1.8 Module contents

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