optimeed

Release 1.0

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Contents

Optimeed is a free open source package that allows to perform optimization and data visualization/management.

CHAPTER 1

Requirements

- PyQt5 for visualisation -> `pip install PyQt5`
- *pyopengl* for visualisation -> `pip install PyOpenGL`
- Numpy -> `pip install numpy`
- **Optional**
  - pandas which is only used to export excel files -> `pip install pandas`
  - `nlopt` library for using other types of algorithm. -> `pip install nlopt`
  - inkscape software for exporting graphs in .png and .pdf)

CHAPTER 2

Installation

To install the latest optimeed release, run the following command:

```
pip install optimeed
```

To install the latest development version of optimeed, run the following commands:

```
git clone https://git.immc.ucl.ac.be/chdegreef/optimeed.git
cd optimeed
python setup.py install
```

CHAPTER 3

Quickstart

Examples can be found on the tutorial folder .

3.1 Quickstart Optimization

An optimization process can be presented as following:

- **Optimization algorithm:** *algorithmInterface*. This is the algorithm that performs the optimization, and outputs a vector of variables between [0, 1[.
- **Maths to physics:** *interfaceMathsToPhysics*. Transforms the output vector of the optimization algorithm to the variables of a *InterfaceDevice*. The usage of this block becomes meaningful for more complex optimization problem, such as optimizing a BLDC motor while keeping the outer diameter constant. In this case, a good implementation of the M2P block automatically scales the inner dimensions of the motor to comply with this constraint.
- **Characterization:** *interfaceCharacterization*. Based on the attributes of the device, performs some computation. This block is nearly useless for simple optimization problems (when the objective function is easily computed) but becomes interesting for more complex problems, where many things need to be precalculated before obtaining the objective functions and constraints. This for example can hold an analytical or a FEM magnetic model. A sub-optimization could also be performed there.
- **Objective and constraints:** *interfaceObjCons*. These classes correspond to either what has to be minimized, or which constraints <=0 has to be complied with.

Quick example: $\min_{x,y\in[0,2]} f(x) = \sqrt{1+(y+3)\cdot x^2}, g(x) = 4+2\sqrt{y+3}\cdot\sqrt{1+(x-1)^2}$, under the constrained that $x \leq 0.55$. This is a bi-objective problem and will lead to a pareto front.

```
"""This example shows how to start a small optimization problem. Start with these␣
↪imports: (note: full path is not necessary)"""

from optimeed.core import InterfaceDevice
from optimeed.optimize.optiAlgorithms import MultiObjective_GA as␣
↪OptimizationAlgorithm
```

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```
# from optimeed.optimize.optiAlgorithms import NLOpt_Algorithm as␣
↪OptimizationAlgorithm  # Toggle this line to use NLOpt
from optimeed.optimize import Optimizer, Real_OptimizationVariable, InterfaceObjCons,␣
↪InterfaceCharacterization
from optimeed.visualize.displayOptimization import OptimizationDisplayer
from optimeed.visualize import start_qt_mainloop
import time


"""User-defined structures"""


class Device(InterfaceDevice):
    """Define the Device to optimize."""
    x: float  # Type hinted -> will be automatically saved
    y: float  # Type hinted -> will be automatically saved

    def __init__(self):
        self.x = 1
        self.y = 1


class Characterization(InterfaceCharacterization):
    """Define the Characterization scheme. In this case nothing is performed,
     but this is typically where model code will be executed and results saved."""
    def compute(self, theMachine):
        time.sleep(0.005)


class MyObjective1(InterfaceObjCons):
    """First objective function (to be minimized)"""
    def compute(self, theDevice):
        return (1 + (theDevice.y+3)*theDevice.x**2)**0.5


class MyObjective2(InterfaceObjCons):
    """Second objective function (to be minimized)"""
    def compute(self, theDevice):
        return 4 + 2*(theDevice.y+3)**0.5*(1+(theDevice.x-1)**2)**0.5


class MyConstraint(InterfaceObjCons):
    """Constraints, that needs to be <= 0"""
    def compute(self, theDevice):
        return theDevice.x - 0.55


def run():
    """Start the main code. Instantiate previously defined classes."""
    theDevice = Device()
    theAlgo = OptimizationAlgorithm()
    theAlgo.set_optionValue(theAlgo.NUMBER_OF_CORES, 4)  # Toggle this line to use␣
↪more cores. Default is 1 (single core)

    theCharacterization = Characterization()

    """Variable to be optimized"""
```

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```
    optimizationVariables = list()
    optimizationVariables.append(Real_OptimizationVariable('x', 0, 2))  #
    optimizationVariables.append(Real_OptimizationVariable('y', 0, 2))

    """Objective and constraints"""
    listOfObjectives = [MyObjective1(), MyObjective2()]
    listOfConstraints = [MyConstraint()]

    """Set the optimizer"""
    theOptimizer = Optimizer()
    theOptimizer.set_optionValue(theOptimizer.KWARGS_OPTIHISTO, {"autosave": True})
    PipeOptimization = theOptimizer.set_optimizer(theDevice, listOfObjectives,␣
↪listOfConstraints, optimizationVariables, theOptimizationAlgorithm=theAlgo,␣
↪theCharacterization=theCharacterization)
    theOptimizer.set_max_opti_time(3)

    """Start the optimization"""
    display_opti = True
    if display_opti:  # Display real-time graphs
        optiDisplayer = OptimizationDisplayer(PipeOptimization, listOfObjectives,␣
↪theOptimizer)
        _, _, _ = optiDisplayer.generate_optimizationGraphs()
        resultsOpti, convergence = optiDisplayer.launch_optimization()
    else:  # Just focus on results
        resultsOpti, convergence = theOptimizer.run_optimization()

    """Gather results"""
    print("Best individuals :")
    for device in resultsOpti:
        print("x : {} \t y : {}". format(device.x, device.y))

    if display_opti:
        start_qt_mainloop()  # To keep windows alive

    """Note that the results are automatically saved if KWARGS_OPTIHISTO␣
↪autosaved=True.
    In this case, optimization folder is automatically generated in Workspace/optiX.␣
↪It contains five files:
    -> autosaved: contains all the devices evaluated during the optimization
    -> logopti: contains all the information relating to the optimization itself:␣
↪objectives, constraints, evaluation time.
    -> opticonvergence: contains all the information relative to the convergence of␣
↪the optimization (saved only at the end)
    -> results: all the best devices as decided by the optimization algorithm
    -> summary.html: a summary of the optimization problem
    See other tutorials on how to save/load these information.
    """
```

3.2 Quickstart Visualization

Visualization implies to have a GUI, which will help to display many things: graphs, text, 3D representations, ... This software provides a clean interface to PyQt. PyQt works that way:

- A QMainWindow that includes layouts, (ex: horizontal, vertical, grid, ...)

- Layouts can include widgets.
- Widgets can be anything: buttons, menu, opengl 3D representation, graphs, ... Several high-level widgets are proposed, check *optimeed.visualize.gui.widgets*.

3.2.1 Simple gui using OpenGL:

```
"""This example shows how to create a simple gui that contains an openGL widget.
↪First define the imports:"""
from optimeed.visualize.gui.widgets.widget_openGL import widget_openGL
from optimeed.visualize.gui.gui_mainWindow import gui_mainWindow

from optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface import
↪DeviceDrawerInterface
from optimeed.core.interfaceDevice import InterfaceDevice
from optimeed.visualize.gui.widgets.openGLWidget.OpenGlFunctions_Library import *
from optimeed.visualize.gui.widgets.openGLWidget.Materials_visual import *


class Cone(InterfaceDevice):
    """Device to be drawn"""
    def __init__(self):
        self.width = 1  # base width
        self.height = 1.5  # height


class ConeDrawer(DeviceDrawerInterface):
    """Drawer of the device"""
    def __init__(self):
        self.theCone = None

    def draw(self, theCone):
        self.theCone = theCone
        glPushMatrix()  # Remove the previous matrices transformations
        glTranslate(0, 0, -theCone.height/2)  # Move the cone
        Bronze_material.activateMaterialProperties()  # Change colour aspect of the
↪cones
        draw_disk(0, theCone.width, 50, translate=theCone.height)  # Draw the base
        gluCylinder(gluNewQuadric(), 0, theCone.width, theCone.height, 50, 10)  #
↪Draw the cylinde
        glPopMatrix()  # Push back previous matrices transformations

    def get_init_camera(self, theDevice):
        tipAngle = 10
        viewAngle = 10
        zoomLevel = 0.5
        return tipAngle, viewAngle, zoomLevel

    def keyboard_push_action(self, theKey):
        if theKey == ord(b'H'):
            self.theCone.x += 0.2  # Change the radius length when h is pressed


def run():
    """Instantiates objects and run the code"""
    openGlWidget = widget_openGL()
    theDrawer = ConeDrawer()
```

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```
    theCone = Cone()
    openGlWidget.set_deviceDrawer(theDrawer)
    openGlWidget.set_deviceToDraw(theCone)
    myWindow = gui_mainWindow([openGlWidget])
    myWindow.run(True)
```

3.2.2 Advanced visualization:

```
"""This example truly shows the potential of this tool, by linking saved data to␣
↪graphs."""

from optimeed.core import ListDataStruct
# Visuals imports
from optimeed.core.linkDataGraph import LinkDataGraph, HowToPlotGraph
from optimeed.visualize.gui.gui_mainWindow import gui_mainWindow
# Graph visuals imports
from optimeed.visualize.gui.widgets.widget_graphs_visual import widget_graphs_visual
from optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick import *
from optimeed.visualize.gui.widgets.graphsVisualWidget.smallGui import guiPyqtgraph
# OpenGL imports
from optimeed.visualize.gui.widgets.widget_openGL import widget_openGL
from optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface import␣
↪DeviceDrawerInterface
from optimeed.visualize.gui.widgets.openGLWidget.OpenGlFunctions_Library import *
from optimeed.visualize.gui.widgets.openGLWidget.Materials_visual import *

import os


class Drawer(DeviceDrawerInterface):
    def __init__(self):
        self.theDevice = None

    def draw(self, theDevice):
        self.theDevice = theDevice
        glPushMatrix()
        Bronze_material.activateMaterialProperties()
        draw_simple_rectangle(theDevice.x, theDevice.y)
        glPopMatrix()

    def get_init_camera(self, theDevice):
        return 0, 0, 0.5


def run():
    """Example on how to get back data from optimization"""

    """Load collections. File is relative to this directory __file__"""
    foldername = os.path.join(os.path.dirname(__file__), 'resources')
    collection_devices = ListDataStruct.load(foldername + '/autosaved.json')
    collection_logOpti = ListDataStruct.load(foldername + '/logopti.json')

    """Instantiates high level module that links the data contained in collections to␣
↪graphs (that will be later created)"""
    theDataLink = LinkDataGraph()
```

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```
    id_logOpti = theDataLink.add_collection(collection_logOpti)
    id_devices = theDataLink.add_collection(collection_devices)

    """The attributes to plots on x and y axis, and additional kwargs."""
    howToPlot = HowToPlotGraph('objectives[0]', 'objectives[1]', {'x_label':
↪"Objective 1", 'y_label': "Objective 2", 'is_scattered': True})

    """The trick here is that the objective functions is not directly stocked in␣
↪collection_devices but in collection_logOpti. So we display the
    objectives coming from collection_logOpti but we link collection_devices from it."
↪""
    howToPlot.exclude_col(id_devices)
    theDataLink.link_collection_to_graph_collection(id_logOpti, id_devices)  # Link␣
↪the devices to the logopti

    """Generate the graphs"""
    theDataLink.add_graph(howToPlot)
    theGraphs = theDataLink.createGraphs()

    """Add additional actions to perform when the graph is clicked. This is what␣
↪makes this software extremely powerful."""
    theActionsOnClick = list()

    openGlDrawing = widget_openGL()
    openGlDrawing.set_deviceDrawer(Drawer())

    theActionsOnClick.append(on_graph_click_showAnim(theDataLink,␣
↪DataAnimationOpenGL(openGlDrawing)))
    theActionsOnClick.append(on_graph_click_showInfo(theDataLink, visuals=[Repr_
↪opengl(Drawer())]))
    theActionsOnClick.append(on_click_extract_pareto(theDataLink, max_x=False, max_
↪y=False))
    theActionsOnClick.append(on_graph_click_delete(theDataLink))

    """Create the widget of the graphs, and the associated GUI"""
    myWidgetGraphsVisuals = widget_graphs_visual(theGraphs, highlight_last=True,␣
↪refresh_time=-1)
    guiPyqtgraph(myWidgetGraphsVisuals, actionsOnClick=theActionsOnClick)  # Add GUI␣
↪to change action easily and export graphs
    myWidgetGraphsVisuals = myWidgetGraphsVisuals

    """Launch the window"""
    myWindow = gui_mainWindow([myWidgetGraphsVisuals])
    myWindow.run(True)
```

3.3 Loading and saving data

You will probably have to often manipulate data, saving them and loading them.

Imagine the following structure to be saved:

```
class TopoA:
    def __init__(self):
        self.R_in = 3e-3
```

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```
        self.R_out = 5e-3


class MyMotor:
    def __init__(self):
        self.rotor = TopoA()
        self.length = 5e-3
        self.dummyVariableToNotSave = 1234
```

optimeed provides a way to export that directly in JSON format. It detects the variables to save from type hints:

```
class TopoA:
    R_in: float
    R_out: float

    def __init__(self):
        self.R_in = 3e-3
        self.R_out = 5e-3


class MyMotor:
    rotor: TopoA
    length: float

    def __init__(self):
        self.rotor = TopoA()
        self.length = 5e-3
        self.dummyVariableToNotSave = 1234
```

If type hint is not possible because some type is not known before the running time, optimeed provides an additional tool *SaveableObject*:

```
from optimeed.core import SaveableObject


class TopoA:
    R_in: float
    R_out: float

    def __init__(self):
        self.R_in = 3e-3
        self.R_out = 5e-3


class MyMotor(SaveableObject):
    length: float

    def __init__(self):
        self.rotor = TopoA()
        self.length = 5e-3
        self.dummyVariableToNotSave = 1234

    def get_additional_attributes_to_save(self):
        return ["rotor"]
```

The item can then be converted to a dictionary using *obj_to_json()*, which can then be converted to string liberal using “json.dumps” and written on a file. To recover To recover the object, read the file and interpret is as a dictionary

using “json.load”. Then, convert the dictionary by using *json_to_obj()*

Alternatively, it might be simpler to use the class *ListDataStruct* (or similar user-custom class), which provides high-level save and load option. This is what is done in *OptiHistoric*

CHAPTER 4

Gallery

4.1 Gallery

CHAPTER 5

License and support

5.1 License and Support

5.1.1 License

The project is distributed "has it is" under GNU General Public License v3.0 (GPL), which is a strong copyleft license. This means that the code is open-source and you are free to do anything you want with it, **as long as you apply the same license to distribute your code**. This constraining license is imposed by the use of Platypus Library as "optimization algorithm library", which is under GPL license.

It is perfectly possible to use other optimization library (which would use the same algorithms but with a different implementation) and to interface it to this project, so that the use of platypus is no longer needed. This work has already been done for NLopt, which is under MIT license (not constraining at all). In that case, **after removing all the platypus sources** (optiAlgorithms/multiObjective_GA and optiAlgorithsm/platypus/*), the license of the present work becomes less restrictive: GNU Lesser General Public License (LGPL). As for the GPL, this license makes the project open-source and free to be modified, but (nearly) no limitation is made to distribute your code.

5.1.2 Support

Github (preferably) / Send mail at christophe.degreef@uclouvain.be

CHAPTER 6

API

6.1 API optimeed

6.1.1 Subpackages

consolidate

parametric_analysis

Module Contents

class Parametric_Collection(***kwargs*)
Bases: optimeed.core.collection.Collection

class Parametric_parameter(*analyzed_attribute*, *reference_device*)
Abstract class for a parametric parameter

get_reference_device(*self*)

get_analyzed_attribute(*self*)

class Parametric_minmax(*analyzed_attribute*, *reference_device*, *minValue*, *maxValue*, *is_adim=False*, *npoints=10*)
Bases: *optimeed.consolidate.parametric_analysis.Parametric_parameter*

get_values(*self*)

class Parametric_analysis(*theParametricParameter*, *theCharacterization*, *filename_collection=None*, *description_collection=None*, *autosave=False*)
Bases: *optimeed.core.Option_class*

NUMBER_OF_CORES = 1

run(*self*)
Instantiates input arguments for analysis

evaluate(*self*, *theDevice*)

initialize_output_collection(*self*)

Package Contents

class Option_class

get_optionValue(*self*, *optionId*)

set_optionValue(*self*, *optionId*, *value*)

get_all_options(*self*)

set_all_options(*self*, *options*)

add_option(*self*, *idOption*, *name*, *value*)

getPath_workspace()

rsetattr(*obj*, *attr*, *val*)

rgetattr(*obj*, *attr*)
Recursively get an attribute from object. Extends getattr method

Parameters

- **obj** – object
- **attr** – attribute to get

Returns

class text_format

PURPLE = [95m

CYAN = [96m

DARKCYAN = [36m

BLUE = [94m

GREEN = [92m

YELLOW = [93m

WHITE = [30m

RED = [91m

BOLD = [1m

UNDERLINE = [4m

END = [0m

indentParagraph(*text_in*, *indent_level=1*)

class Parametric_Collection(***kwargs*)
Bases: `optimeed.core.collection.Collection`

class Parametric_parameter(*analyzed_attribute*, *reference_device*)
Abstract class for a parametric parameter

get_reference_device(*self*)

get_analyzed_attribute(*self*)

class Parametric_minmax(*analyzed_attribute*, *reference_device*, *minValue*, *maxValue*, *is_adim=False*, *npoints=10*)

Bases: *optimeed.consolidate.parametric_analysis.Parametric_parameter*

get_values(*self*)

class Parametric_analysis(*theParametricParameter*, *theCharacterization*, *filename_collection=None*, *description_collection=None*, *autosave=False*)

Bases: *optimeed.core.Option_class*

NUMBER_OF_CORES = 1

run(*self*)

Instantiates input arguments for analysis

evaluate(*self*, *theDevice*)

initialize_output_collection(*self*)

core

Subpackages

ansi2html

converter

Module Contents

ANSI_FULL_RESET = 0

ANSI_INTENSITY_INCREASED = 1

ANSI_INTENSITY_REDUCED = 2

ANSI_INTENSITY_NORMAL = 22

ANSI_STYLE_ITALIC = 3

ANSI_STYLE_NORMAL = 23

ANSI_BLINK_SLOW = 5

ANSI_BLINK_FAST = 6

ANSI_BLINK_OFF = 25

ANSI_UNDERLINE_ON = 4

ANSI_UNDERLINE_OFF = 24

ANSI_CROSSED_OUT_ON = 9

ANSI_CROSSED_OUT_OFF = 29

ANSI_VISIBILITY_ON = 28

ANSI_VISIBILITY_OFF = 8

ANSI_FOREGROUND_CUSTOM_MIN = 30

ANSI_FOREGROUND_CUSTOM_MAX = 37

ANSI_FOREGROUND_256 = 38

ANSI_FOREGROUND_DEFAULT = 39

ANSI_BACKGROUND_CUSTOM_MIN = 40

ANSI_BACKGROUND_CUSTOM_MAX = 47

ANSI_BACKGROUND_256 = 48

ANSI_BACKGROUND_DEFAULT = 49

ANSI_NEGATIVE_ON = 7

ANSI_NEGATIVE_OFF = 27

ANSI_FOREGROUND_HIGH_INTENSITY_MIN = 90

ANSI_FOREGROUND_HIGH_INTENSITY_MAX = 97

ANSI_BACKGROUND_HIGH_INTENSITY_MIN = 100

ANSI_BACKGROUND_HIGH_INTENSITY_MAX = 107

VT100_BOX_CODES

_latex_template = \documentclass{scrartcl}

usepackage[utf8]{inputenc} usepackage{fancyvrb} usepackage[usenames,dvipsnames]{xcolor} %% definecolor{red-sd}{HTML}{7ed2d2}

title{%(title)s}

fvset{commandchars=\{\}}

begin{document}

begin{Verbatim} %(content)s end{Verbatim} end{document}

_html_template

class _State

Bases: `object`

reset(*self*)

adjust(*self*, *ansi_code*, *parameter=None*)

to_css_classes(*self*)

linkify(*line*, *latex_mode*)

map_vt100_box_code(*char*)

_needs_extra_newline(*text*)

class CursorMoveUp

Bases: `object`

class Ansi2HTMLConverter(*latex=False*, *inline=False*, *dark_bg=True*, *line_wrap=True*, *font_size='normal'*, *linkify=False*, *escaped=True*, *markup_lines=False*, *output_encoding='utf-8'*, *scheme='ansi2html'*, *title=''*)

Bases: `object`

Convert Ansi color codes to CSS+HTML

Example: >>> conv = Ansi2HTMLConverter() >>> ansi = " ".join(sys.stdin.readlines()) >>> html = conv.convert(ansi)

apply_regex(*self*, *ansi*)

_apply_regex(*self*, *ansi*, *styles_used*)

_collapse_cursor(*self*, *parts*)
Act on any CursorMoveUp commands by deleting preceding tokens

prepare(*self*, *ansi=''*, *ensure_trailing_newline=False*)
Load the contents of 'ansi' into this object

attrs(*self*)
Prepare attributes for the template

convert(*self*, *ansi*, *full=True*, *ensure_trailing_newline=False*)

produce_headers(*self*)

main()
$ ls –color=always | ansi2html > directories.html $ sudo tail /var/log/messages | ccze -A | ansi2html > logs.html $ task burndown | ansi2html > burndown.html

style

Module Contents

class Rule(*klass*, ***kw*)
Bases: `object`

__str__(*self*)

index(*r*, *g*, *b*)

color_component(*x*)

color(*r*, *g*, *b*)

level(*grey*)

index2(*grey*)

SCHEME

intensify(*color*, *dark_bg*, *amount=64*)

get_styles(*dark_bg=True*, *line_wrap=True*, *scheme='ansi2html'*)

util

Module Contents

read_to_unicode(*obj*)

Package Contents

class Ansi2HTMLConverter(*latex=False*, *inline=False*, *dark_bg=True*, *line_wrap=True*, *font_size='normal'*, *linkify=False*, *escaped=True*, *markup_lines=False*, *output_encoding='utf-8'*, *scheme='ansi2html'*, *title=''*)

Bases: `object`

Convert Ansi color codes to CSS+HTML

Example: >>> conv = Ansi2HTMLConverter() >>> ansi = " ".join(sys.stdin.readlines()) >>> html = conv.convert(ansi)

apply_regex(*self*, *ansi*)

_apply_regex(*self*, *ansi*, *styles_used*)

_collapse_cursor(*self*, *parts*)
Act on any CursorMoveUp commands by deleting preceding tokens

prepare(*self*, *ansi=''*, *ensure_trailing_newline=False*)
Load the contents of 'ansi' into this object

attrs(*self*)
Prepare attributes for the template

convert(*self*, *ansi*, *full=True*, *ensure_trailing_newline=False*)

produce_headers(*self*)

collection

Module Contents

class DataStruct_Interface

get_info(*self*)
Get simple string describing the datastructure

set_info(*self*, *info*)
Set simple string describing the datastructure

__str__(*self*)

class AutosaveStruct(*dataStruct*, *filename=''*, *change_filename_if_exists=True*)
Structure that provides automated save of DataStructures

__str__(*self*)

get_filename(*self*)
Get set filename

set_filename(*self*, *filename*, *change_filename_if_exists*)

Parameters

- **filename** – Filename to set
- **change_filename_if_exists** – If already exists, create a new filename

stop_autosave(*self*)
Stop autosave

start_autosave(*self*, *timer_autosave*)
Start autosave

save(*self*, *safe_save=True*)
Save

get_datastruct(*self*)
Return :class:'~DataStruct_Interface'

class ListDataStruct
Bases: *optimeed.core.collection.DataStruct_Interface*

_INFO_STR = info

_DATA_STR = data

save(*self*, *filename*)
Save data using json format. The data to be saved are automatically detected, see *obj_to_json()*

add_data(*self*, *data_in*)
Add a data to the list

get_data(*self*)
Get full list of datas

set_data(*self*, *theData*)
Set full list of datas

set_data_at_index(*self*, *data_in*, *index*)
Replace data at specific index

set_attribute_data(*self*, *the_attribute*, *the_value*)
Set attribute to all data

set_attribute_equation(*self*, *attribute_name*, *equation_str*)
Advanced method to set the value of attribute_name from equation_str

Parameters

- **attribute_name** – string (name of the attribute to set)
- **equation_str** – formatted equation, check `applyEquation()`

Returns

get_list_attributes(*self*, *attributeName*)
Get the value of attributeName of all the data in the Collection

Parameters **attributeName** – string (name of the attribute to get)

Returns list

delete_points_at_indices(*self*, *indices*)
Delete several elements from the Collection

Parameters **indices** – list of indices to delete

export_xls(*self*, *excelFilename*, *excelsheet='Sheet1'*, *mode='w'*)
Export the collection to excel. It only exports the direct attributes.

Parameters

- **excelFilename** – filename of the excel
- **excelsheet** – name of the sheet
- **mode** – 'w' to erase existing file, 'a' to append sheetname to existing file

merge(*self*, *collection*)
Merge a collection with the current collection

Parameters **collection** – Collection to merge

color_palette

Module Contents

default_palette(*N*)

blackOnly(*N*)

dark2(*N*)

commonImport

Module Contents

SHOW_WARNING = 0

SHOW_INFO = 1

SHOW_ERROR = 2

SHOW_DEBUG = 3

SHOW_CURRENT

graphs

Module Contents

class Data(*x: list*, *y: list*, *x_label=''*, *y_label=''*, *legend=''*, *is_scattered=False*, *transfo_x=lambda selfData*, *x: x*, *transfo_y=lambda selfData*, *y: y*, *xlim=None*, *ylim=None*, *permutations=None*, *sort_output=False*, *color=None*, *symbol='o'*, *symbolsize=8*, *fillsymbol=True*, *outlinesymbol=1.8*, *linestyle='-'*, *width=2*)
This class is used to store informations necessary to plot a 2D graph. It has to be combined with a gui to be useful (ex. pyqtgraph)

set_data(*self*, *x: list*, *y: list*)
Overwrites current datapoints with new set

get_x(*self*)
Get x coordinates of datapoints

get_symbolsize(*self*)
Get size of the symbols

symbol_isfilled(*self*)
Check if symbols has to be filled or not

get_symbolOutline(*self*)
Get color factor of outline of symbols

get_length_data(*self*)
Get number of points

get_xlim(*self*)
Get x limits of viewbox

get_ylim(*self*)
Get y limits of viewbox

get_y(*self*)
Get y coordinates of datapoints

get_color(*self*)
Get color of the line

get_width(*self*)
Get width of the line

get_number_of_points(*self*)
Get number of points

get_plot_data(*self*)
Call this method to get the x and y coordinates of the points that have to be displayed. => After transformation, and after permutations.

Returns x (list), y (list)

get_permutations(*self*)
Return the transformation 'permutation': xplot[i] = xdata[permutation[i]]

get_invert_permutations(*self*)
Return the inverse of permutations: xdata[i] = xplot[revert[i]]

get_dataIndex_from_graphIndex(*self*, *index_graph_point*)
From an index given in graph, recovers the index of the data.

Parameters **index_graph_point** – Index in the graph

Returns index of the data

get_dataIndices_from_graphIndices(*self*, *index_graph_point_list*)
Same as get_dataIndex_from_graphIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_graph_point_list** – List of Index in the graph

Returns List of index of the data

get_graphIndex_from_dataIndex(*self*, *index_data*)
From an index given in the data, recovers the index of the graph.

Parameters **index_data** – Index in the data

Returns index of the graph

get_graphIndices_from_dataIndices(*self*, *index_data_list*)
Same as get_graphIndex_from_dataIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_data_list** – List of Index in the data

Returns List of index of the graph

set_permutations(*self*, *permutations*)
Set permutations between datapoints of the trace

Parameters **permutations** – list of indices to plot (example: [0, 2, 1] means that the first point will be plotted, then the third, then the second one)

get_x_label (*self*)
Get x label of the trace

get_y_label (*self*)
Get y label of the trace

get_legend (*self*)
Get name of the trace

get_symbol (*self*)
Get symbol

add_point (*self*, *x*, *y*)
Add point(s) to trace (inputs can be list or numeral)

delete_point (*self*, *index_point*)
Delete a point from the datapoints

is_scattered (*self*)
Delete a point from the datapoints

set_indices_points_to_plot (*self*, *indices*)
Set indices points to plot

get_indices_points_to_plot (*self*)
Get indices points to plot

get_linestyle (*self*)
Get linestyle

__str__ (*self*)

export_str (*self*)
Method to save the points constituting the trace

class Graph
Simple graph container that contains several traces

add_trace (*self*, *data*)
Add a trace to the graph

Parameters **data** – *Data*

Returns id of the created trace

remove_trace (*self*, *idTrace*)
Delete a trace from the graph

Parameters **idTrace** – id of the trace to delete

get_trace (*self*, *idTrace*)
Get data object of idTrace

Parameters **idTrace** – id of the trace to get

Returns *Data*

get_all_traces (*self*)
Get all the traces id of the graph

export_str (*self*)

class Graphs
Contains several *Graph*

updateChildren (*self*)

add_trace_firstGraph(*self*, *data*, *updateChildren=True*)
Same as add_trace, but only if graphs has only one id :param data: :param updateChildren: :return:

add_trace(*self*, *idGraph*, *data*, *updateChildren=True*)
Add a trace to the graph

Parameters

- **idGraph** – id of the graph
- **data** – *Data*
- **updateChildren** – Automatically calls callback functions

Returns id of the created trace

remove_trace(*self*, *idGraph*, *idTrace*, *updateChildren=True*)
Remove the trace from the graph

Parameters

- **idGraph** – id of the graph
- **idTrace** – id of the trace to remove
- **updateChildren** – Automatically calls callback functions

get_first_graph(*self*)
Get id of the first graph

Returns id of the first graph

get_graph(*self*, *idGraph*)
Get graph object at idgraph

Parameters **idGraph** – id of the graph to get

Returns *Graph*

get_all_graphs_ids(*self*)
Get all ids of the graphs

Returns list of id graphs

get_all_graphs(*self*)
Get all graphs. Return dict {id: *Graph*}

add_graph(*self*, *updateChildren=True*)
Add a new graph

Returns id of the created graph

remove_graph(*self*, *idGraph*)
Delete a graph

Parameters **idGraph** – id of the graph to delete

add_update_method(*self*, *childObject*)
Add a callback each time a graph is modified.

Parameters **childObject** – method without arguments

export_str(*self*)
Export all the graphs in text

Returns str

merge(*self*, *otherGraphs*)

reset (*self*)

interfaceDevice

Module Contents

class InterfaceDevice

Interface class that represents a device. Hidden feature: variables that need to be saved must be type-hinted: e.g.: x: int. See *obj_to_json()* for more info

assign (*self*, *machine_to_assign*, *resetAttribute=False*)

Copy the attribute values of machine_to_assign to self. The references are not lost.

Parameters

- **machine_to_assign** – InterfaceDevice
- **resetAttribute** –

linkDataGraph

Module Contents

class HowToPlotGraph (*attribute_x*, *attribute_y*, *kwargs_graph=None*, *excluded=None*)

exclude_col (*self*, *id_col*)

Add id_col to exclude from the graph

__str__ (*self*)

class CollectionInfo (*theCollection*, *kwargs*, *theID*)

get_collection (*self*)

get_kwargs (*self*)

get_id (*self*)

class LinkDataGraph

class _collection_linker

add_link (*self*, *idSlave*, *idMaster*)

get_collection_master (*self*, *idToGet*)

is_slave (*self*, *idToCheck*)

set_same_master (*self*, *idExistingSlave*, *idOtherSlave*)

Parameters

- **idExistingSlave** – id collection of the existing slave
- **idOtherSlave** – id collection of the new slave that has to be linked to an existing master

add_collection (*self*, *theCollection*, *kwargs=None*)

add_graph (*self*, *howToPlotGraph*)

createGraphs (*self*)

get_howToPlotGraph (*self*, *idGraph*)

get_collectionInfo (*self*, *idCollectionInfo*)

create_trace (*self*, *collectionInfo*, *howToPlotGraph*, *idGraph*)

get_all_id_graphs (*self*)

get_all_traces_id_graph (*self*, *idGraph*)

update_graphs (*self*)

is_slave (*self*, *idGraph*, *idTrace*)

get_idCollection_from_graph (*self*, *idGraph*, *idTrace*, *getMaster=True*)
From indices in the graph, get index of corresponding collection

get_collection_from_graph (*self*, *idGraph*, *idTrace*, *getMaster=True*)
From indices in the graph, get corresponding collection

get_dataObject_from_graph (*self*, *idGraph*, *idTrace*, *idPoint*)

get_dataObjects_from_graph (*self*, *idGraph*, *idTrace*, *idPoint_list*)

remove_element_from_graph (*self*, *idGraph*, *idTrace*, *idPoint*, *deleteFromMaster=False*)
Remove element from the graph, or the master collection

remove_elements_from_trace (*self*, *idGraph*, *idTrace*, *idPoints*, *deleteFromMaster=False*)
Performances optimisation when compared to *LinkDataGraph.remove_element_from_graph()*

link_collection_to_graph_collection (*self*, *id_collection_graph*, *id_collection_master*)
Link data :param id_collection_graph: :param id_collection_master: :return:

remove_trace (*self*, *idGraph*, *idTrace*)

get_graph_and_trace_from_collection (*self*, *idCollection*)
Reverse search: from a collection, get the associated graph

get_mappingData_graph (*self*, *idGraph*)

get_mappingData_trace (*self*, *idGraph*, *idTrace*)

myjson

Module Contents

MODULE_TAG = __module__

CLASS_TAG = __class__

EXCLUDED_TAGS

class SaveableObject
Abstract class for dynamically type-hinted objects. This class is to solve the special case where the exact type of an attribute is not known before runtime, yet has to be saved.

_get_object_class (*theObj*)

_get_object_module (*theObj*)

_object_to_FQCN(*theobj*)
Gets module path of object

_find_class(*moduleName*, *className*)

json_to_obj(*json_dict*)
Convenience class to create object from dictionary. Only works if CLASS_TAG is valid

Parameters **json_dict** – dictionary loaded from a json file.

Raises

- **TypeError** – if class can not be found
- **KeyError** – if CLASS_TAG not present in dictionary

json_to_obj_safe(*json_dict*, *cls*)
Safe class to create object from dictionary.

Parameters

- **json_dict** – dictionary loaded from a json file
- **cls** – class object to instantiate with dictionary

_instantiates_annotated_object(*_json_dict*, *_cls*)

obj_to_json(*theObj*)
Extract the json dictionary from the object. The data saved are automatically detected, using typehints. ex: x: int=5 will be saved, x=5 won't.

encode_str_json(*theStr*)

decode_str_json(*theStr*)

options

Module Contents

class Options

get_name(*self*, *idOption*)

get_value(*self*, *idOption*)

add_option(*self*, *idOption*, *name*, *value*)

set_option(*self*, *idOption*, *value*)

copy(*self*)

set_self(*self*, *the_options*)

__str__(*self*)

class Option_class

get_optionValue(*self*, *optionId*)

set_optionValue(*self*, *optionId*, *value*)

get_all_options(*self*)

set_all_options(*self*, *options*)

add_option(*self*, *idOption*, *name*, *value*)

tools

Module Contents

class text_format

PURPLE = [95m

CYAN = [96m

DARKCYAN = [36m

BLUE = [94m

GREEN = [92m

YELLOW = [93m

WHITE = [30m

RED = [91m

BOLD = [1m

UNDERLINE = [4m

END = [0m

software_version()

find_and_replace(*begin_char*, *end_char*, *theStr*, *replace_function*)

create_unique_dirname(*dirname*)

applyEquation(*objectIn*, *s*)
Apply literal expression based on an object

Parameters

- **objectIn** – Object
- **s** – literal expression. Float variables taken from the object are written between {}, int between []. Example: s="{x}+{y}*2" if x and y are attributes of objectIn.

Returns value (float)

arithmeticEval(*s*)

isNonePrintMessage(*theObject*, *theMessage*, *show_type=SHOW_INFO*)

getPath_workspace()

getLineInfo(*lvl=1*)

printIfShown(*theStr*, *show_type=SHOW_DEBUG*, *isToPrint=True*, *appendTypeName=True*)

universalPath(*thePath*)

add_suffix_to_path(*thePath*, *suffix*)

get_object_attrs(*obj*)

cart2pol(*x*, *y*)

pol2cart (*rho*, *phi*)

partition (*array*, *begin*, *end*)

quicksort (*array*)

rsetattr (*obj*, *attr*, *val*)

rgetattr (*obj*, *attr*)
Recursively get an attribute from object. Extends getattr method

Parameters

- **obj** – object
- **attr** – attribute to get

Returns

indentParagraph (*text_in*, *indent_level=1*)

dist (*p*, *q*)
Return the Euclidean distance between points p and q. :param p: [x, y] :param q: [x, y] :return: distance (float)

sparse_subset (*points*, *r*)
Returns a maximal list of elements of points such that no pairs of points in the result have distance less than r. :param points: list of tuples (x,y) :param r: distance :return: corresponding subset (list), indices of the subset (list)

integrate (*x*, *y*)
Performs Integral(x[0] to x[-1]) of y dx

Parameters

- **x** – x axis coordinates (list)
- **y** – y axis coordinates (list)

Returns integral value

my_fourier (*x*, *y*, *n*, *L*)
Fourier analys

Parameters

- **x** – x axis coordinates
- **y** – y axis coordinates
- **n** – number of considered harmonic
- **L** – half-period length

Returns a and b coefficients (y = a*cos(x) + b*sin(y))

linspace (*start*, *stop*, *npoints*)

truncate (*theStr*, *truncsize*)

str_all_attr (*theObject*, *max_recursion_level*)

get_2D_pareto (*xList*, *yList*, *max_X=True*, *max_Y=True*)

get_ND_pareto (*objectives_list*, *are_maxobjectives_list=None*)
Return the N-D pareto front

Parameters

- **objectives_list** – list of list of objectives: example [[0,1], [1,1], [2,2]]

- **are_maxobjectives_list** – for each objective, tells if they are to be maximized or not: example [True, False]. Default: False

Returns extracted_pareto, indices: list of [x, y, ...] points forming the pareto front, and list of the indices of these points from the base list.

derivate(*t*, *y*)

class fast_LUT_interpolation(*independent_variables*, *dependent_variables*)
Class designed for fast interpolation in look-up table when successive searchs are called often. Otherwise use griddata

interpolate(*self*, *point*, *fill_value=np.nan*)
Perform the interpolation :param point: coordinates to interpolate (tuple or list of tuples for multipoints) :param fill_value: value to put if extrapolated. :return: coordinates

delete_indices_from_list(*indices*, *theList*)
Delete elements from list at indices :param indices: list :param theList: list

Package Contents

getPath_workspace()

obj_to_json(*theObj*)
Extract the json dictionary from the object. The data saved are automatically detected, using typehints. ex: x: int=5 will be saved, x=5 won't.

json_to_obj(*json_dict*)
Convenience class to create object from dictionary. Only works if CLASS_TAG is valid :param json_dict: dictionary loaded from a json file. :raise TypeError: if class can not be found :raise KeyError: if CLASS_TAG not present in dictionary

json_to_obj_safe(*json_dict*, *cls*)
Safe class to create object from dictionary. :param json_dict: dictionary loaded from a json file :param cls: class object to instantiate with dictionary

encode_str_json(*theStr*)

decode_str_json(*theStr*)

class SaveableObject
Abstract class for dynamically type-hinted objects. This class is to solve the special case where the exact type of an attribute is not known before runtime, yet has to be saved.

indentParagraph(*text_in*, *indent_level=1*)

rgetattr(*obj*, *attr*)
Recursively get an attribute from object. Extends getattr method

Parameters

- **obj** – object
- **attr** – attribute to get

Returns

applyEquation(*objectIn*, *s*)
Apply literal expression based on an object

Parameters

- **objectIn** – Object

- **s** – literal expression. Float variables taken from the object are written between {}, int between []. Example: s="{x}+{y}*2" if x and y are attributes of objectIn.

Returns value (float)

printIfShown(*theStr*, *show_type=SHOW_DEBUG*, *isToPrint=True*, *appendTypeName=True*)

SHOW_WARNING = 0

class DataStruct_Interface

get_info(*self*)
Get simple string describing the datastructure

set_info(*self*, *info*)
Set simple string describing the datastructure

__str__(*self*)

class AutosaveStruct(*dataStruct*, *filename=''*, *change_filename_if_exists=True*)
Structure that provides automated save of DataStructures

__str__(*self*)

get_filename(*self*)
Get set filename

set_filename(*self*, *filename*, *change_filename_if_exists*)

Parameters

- **filename** – Filename to set
- **change_filename_if_exists** – If already exists, create a new filename

stop_autosave(*self*)
Stop autosave

start_autosave(*self*, *timer_autosave*)
Start autosave

save(*self*, *safe_save=True*)
Save

get_datastruct(*self*)
Return :class:'~DataStruct_Interface'

class ListDataStruct
Bases: *optimeed.core.collection.DataStruct_Interface*

_INFO_STR = info

_DATA_STR = data

save(*self*, *filename*)
Save data using json format. The data to be saved are automatically detected, see *obj_to_json()*

add_data(*self*, *data_in*)
Add a data to the list

get_data(*self*)
Get full list of datas

set_data(*self*, *theData*)
Set full list of datas

set_data_at_index(*self*, *data_in*, *index*)
Replace data at specific index

set_attribute_data(*self*, *the_attribute*, *the_value*)
Set attribute to all data

set_attribute_equation(*self*, *attribute_name*, *equation_str*)
Advanced method to set the value of attribute_name from equation_str

Parameters

- **attribute_name** – string (name of the attribute to set)
- **equation_str** – formatted equation, check `applyEquation()`

Returns

get_list_attributes(*self*, *attributeName*)
Get the value of attributeName of all the data in the Collection

Parameters **attributeName** – string (name of the attribute to get)

Returns list

delete_points_at_indices(*self*, *indices*)
Delete several elements from the Collection

Parameters **indices** – list of indices to delete

export_xls(*self*, *excelFilename*, *excelsheet='Sheet1'*, *mode='w'*)
Export the collection to excel. It only exports the direct attributes.

Parameters

- **excelFilename** – filename of the excel
- **excelsheet** – name of the sheet
- **mode** – 'w' to erase existing file, 'a' to append sheetname to existing file

merge(*self*, *collection*)
Merge a collection with the current collection

Parameters **collection** – `Collection` to merge

class text_format

PURPLE = [95m

CYAN = [96m

DARKCYAN = [36m

BLUE = [94m

GREEN = [92m

YELLOW = [93m

WHITE = [30m

RED = [91m

BOLD = [1m

UNDERLINE = [4m

END = [0m

software_version()

find_and_replace(*begin_char*, *end_char*, *theStr*, *replace_function*)

create_unique_dirname(*dirname*)

applyEquation(*objectIn*, *s*)
Apply literal expression based on an object

Parameters

- **objectIn** – Object
- **s** – literal expression. Float variables taken from the object are written between {}, int between []. Example: s="{x}+{y}*2" if x and y are attributes of objectIn.

Returns value (float)

arithmeticEval(*s*)

isNonePrintMessage(*theObject*, *theMessage*, *show_type=SHOW_INFO*)

getPath_workspace()

getLineInfo(*lvl=1*)

printIfShown(*theStr*, *show_type=SHOW_DEBUG*, *isToPrint=True*, *appendTypeName=True*)

universalPath(*thePath*)

add_suffix_to_path(*thePath*, *suffix*)

get_object_attrs(*obj*)

cart2pol(*x*, *y*)

pol2cart(*rho*, *phi*)

partition(*array*, *begin*, *end*)

quicksort(*array*)

rsetattr(*obj*, *attr*, *val*)

rgetattr(*obj*, *attr*)
Recursively get an attribute from object. Extends getattr method

Parameters

- **obj** – object
- **attr** – attribute to get

Returns

indentParagraph(*text_in*, *indent_level=1*)

dist(*p*, *q*)
Return the Euclidean distance between points p and q. :param p: [x, y] :param q: [x, y] :return: distance (float)

sparse_subset(*points*, *r*)
Returns a maximal list of elements of points such that no pairs of points in the result have distance less than r. :param points: list of tuples (x,y) :param r: distance :return: corresponding subset (list), indices of the subset (list)

integrate(*x*, *y*)
Performs Integral(x[0] to x[-1]) of y dx

Parameters

- **x** – x axis coordinates (list)
- **y** – y axis coordinates (list)

Returns integral value

my_fourier(*x*, *y*, *n*, *L*)
Fourier analys

Parameters

- **x** – x axis coordinates
- **y** – y axis coordinates
- **n** – number of considered harmonic
- **L** – half-period length

Returns a and b coefficients (y = a*cos(x) + b*sin(y))

linspace(*start*, *stop*, *npoints*)

truncate(*theStr*, *truncsize*)

str_all_attr(*theObject*, *max_recursion_level*)

get_2D_pareto(*xList*, *yList*, *max_X=True*, *max_Y=True*)

get_ND_pareto(*objectives_list*, *are_maxobjectives_list=None*)
Return the N-D pareto front

Parameters

- **objectives_list** – list of list of objectives: example [[0,1], [1,1], [2,2]]
- **are_maxobjectives_list** – for each objective, tells if they are to be maximized or not: example [True, False]. Default: False

Returns extracted_pareto, indices: list of [x, y, ...] points forming the pareto front, and list of the indices of these points from the base list.

derivate(*t*, *y*)

class fast_LUT_interpolation(*independent_variables*, *dependent_variables*)
Class designed for fast interpolation in look-up table when successive searchs are called often. Otherwise use griddata

interpolate(*self*, *point*, *fill_value=np.nan*)
Perform the interpolation :param point: coordinates to interpolate (tuple or list of tuples for multipoints) :param fill_value: value to put if extrapolated. :return: coordinates

delete_indices_from_list(*indices*, *theList*)
Delete elements from list at indices :param indices: list :param theList: list

SHOW_WARNING = 0

SHOW_INFO = 1

SHOW_ERROR = 2

SHOW_DEBUG = 3

SHOW_CURRENT

printIfShown(*theStr*, *show_type=SHOW_DEBUG*, *isToPrint=True*, *appendTypeName=True*)

SHOW_WARNING = 0

class Data(*x: list*, *y: list*, *x_label=''*, *y_label=''*, *legend=''*, *is_scattered=False*, *transfo_x=lambda selfData, x: x*, *transfo_y=lambda selfData, y: y*, *xlim=None*, *ylim=None*, *permutations=None*, *sort_output=False*, *color=None*, *symbol='o'*, *symbolsize=8*, *fillsymbol=True*, *outlinesymbol=1.8*, *linestyle='-'*, *width=2*)

This class is used to store informations necessary to plot a 2D graph. It has to be combined with a gui to be useful (ex. pyqtgraph)

set_data(*self*, *x: list*, *y: list*)
Overwrites current datapoints with new set

get_x(*self*)
Get x coordinates of datapoints

get_symbolsize(*self*)
Get size of the symbols

symbol_isfilled(*self*)
Check if symbols has to be filled or not

get_symbolOutline(*self*)
Get color factor of outline of symbols

get_length_data(*self*)
Get number of points

get_xlim(*self*)
Get x limits of viewbox

get_ylim(*self*)
Get y limits of viewbox

get_y(*self*)
Get y coordinates of datapoints

get_color(*self*)
Get color of the line

get_width(*self*)
Get width of the line

get_number_of_points(*self*)
Get number of points

get_plot_data(*self*)
Call this method to get the x and y coordinates of the points that have to be displayed. => After transformation, and after permutations.

Returns x (list), y (list)

get_permutations(*self*)
Return the transformation 'permutation': xplot[i] = xdata[permutation[i]]

get_invert_permutations(*self*)
Return the inverse of permutations: xdata[i] = xplot[revert[i]]

get_dataIndex_from_graphIndex(*self*, *index_graph_point*)
From an index given in graph, recovers the index of the data.

Parameters **index_graph_point** – Index in the graph

Returns index of the data

get_dataIndices_from_graphIndices(*self*, *index_graph_point_list*)
Same as get_dataIndex_from_graphIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_graph_point_list** – List of Index in the graph

Returns List of index of the data

get_graphIndex_from_dataIndex(*self*, *index_data*)
From an index given in the data, recovers the index of the graph.

Parameters **index_data** – Index in the data

Returns index of the graph

get_graphIndices_from_dataIndices(*self*, *index_data_list*)
Same as get_graphIndex_from_dataIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_data_list** – List of Index in the data

Returns List of index of the graph

set_permutations(*self*, *permutations*)
Set permutations between datapoints of the trace

Parameters **permutations** – list of indices to plot (example: [0, 2, 1] means that the first point will be plotted, then the third, then the second one)

get_x_label(*self*)
Get x label of the trace

get_y_label(*self*)
Get y label of the trace

get_legend(*self*)
Get name of the trace

get_symbol(*self*)
Get symbol

add_point(*self*, *x*, *y*)
Add point(s) to trace (inputs can be list or numeral)

delete_point(*self*, *index_point*)
Delete a point from the datapoints

is_scattered(*self*)
Delete a point from the datapoints

set_indices_points_to_plot(*self*, *indices*)
Set indices points to plot

get_indices_points_to_plot(*self*)
Get indices points to plot

get_linestyle(*self*)
Get linestyle

__str__(*self*)

export_str(*self*)
Method to save the points constituting the trace

class Graph
Simple graph container that contains several traces

add_trace(*self*, *data*)
Add a trace to the graph

Parameters **data** – *Data*

Returns id of the created trace

remove_trace(*self*, *idTrace*)
Delete a trace from the graph

Parameters **idTrace** – id of the trace to delete

get_trace(*self*, *idTrace*)
Get data object of idTrace

Parameters **idTrace** – id of the trace to get

Returns *Data*

get_all_traces(*self*)
Get all the traces id of the graph

export_str(*self*)

class Graphs
Contains several *Graph*

updateChildren(*self*)

add_trace_firstGraph(*self*, *data*, *updateChildren=True*)
Same as add_trace, but only if graphs has only one id :param data: :param updateChildren: :return:

add_trace(*self*, *idGraph*, *data*, *updateChildren=True*)
Add a trace to the graph

Parameters

- **idGraph** – id of the graph
- **data** – *Data*
- **updateChildren** – Automatically calls callback functions

Returns id of the created trace

remove_trace(*self*, *idGraph*, *idTrace*, *updateChildren=True*)
Remove the trace from the graph

Parameters

- **idGraph** – id of the graph
- **idTrace** – id of the trace to remove
- **updateChildren** – Automatically calls callback functions

get_first_graph(*self*)
Get id of the first graph

Returns id of the first graph

get_graph(*self*, *idGraph*)
Get graph object at idgraph

Parameters **idGraph** – id of the graph to get

Returns *Graph*

get_all_graphs_ids(*self*)
Get all ids of the graphs

Returns list of id graphs

get_all_graphs(*self*)
Get all graphs. Return dict {id: *Graph*}

add_graph(*self*, *updateChildren=True*)
Add a new graph

Returns id of the created graph

remove_graph(*self*, *idGraph*)
Delete a graph

Parameters **idGraph** – id of the graph to delete

add_update_method(*self*, *childObject*)
Add a callback each time a graph is modified.

Parameters **childObject** – method without arguments

export_str(*self*)
Export all the graphs in text

Returns str

merge(*self*, *otherGraphs*)

reset(*self*)

SHOW_WARNING = 0

SHOW_INFO = 1

SHOW_ERROR = 2

SHOW_DEBUG = 3

SHOW_CURRENT

class InterfaceDevice
Interface class that represents a device. Hidden feature: variables that need to be saved must be type-hinted: e.g.: x: int. See *obj_to_json()* for more info

assign(*self*, *machine_to_assign*, *resetAttribute=False*)
Copy the attribute values of machine_to_assign to self. The references are not lost.

Parameters

- **machine_to_assign** – InterfaceDevice
- **resetAttribute** –

class HowToPlotGraph(*attribute_x*, *attribute_y*, *kwargs_graph=None*, *excluded=None*)

exclude_col(*self*, *id_col*)
Add id_col to exclude from the graph

__str__(*self*)

class CollectionInfo(*theCollection*, *kwargs*, *theID*)

get_collection(*self*)

get_kwargs(*self*)

get_id(*self*)

class LinkDataGraph

class _collection_linker

add_link(*self*, *idSlave*, *idMaster*)

get_collection_master(*self*, *idToGet*)

is_slave(*self*, *idToCheck*)

set_same_master(*self*, *idExistingSlave*, *idOtherSlave*)

Parameters

- **idExistingSlave** – id collection of the existing slave
- **idOtherSlave** – id collection of the new slave that has to be linked to an existing master

add_collection(*self*, *theCollection*, *kwargs=None*)

add_graph(*self*, *howToPlotGraph*)

createGraphs(*self*)

get_howToPlotGraph(*self*, *idGraph*)

get_collectionInfo(*self*, *idCollectionInfo*)

create_trace(*self*, *collectionInfo*, *howToPlotGraph*, *idGraph*)

get_all_id_graphs(*self*)

get_all_traces_id_graph(*self*, *idGraph*)

update_graphs(*self*)

is_slave(*self*, *idGraph*, *idTrace*)

get_idCollection_from_graph(*self*, *idGraph*, *idTrace*, *getMaster=True*)
From indices in the graph, get index of corresponding collection

get_collection_from_graph(*self*, *idGraph*, *idTrace*, *getMaster=True*)
From indices in the graph, get corresponding collection

get_dataObject_from_graph(*self*, *idGraph*, *idTrace*, *idPoint*)

get_dataObjects_from_graph(*self*, *idGraph*, *idTrace*, *idPoint_list*)

remove_element_from_graph(*self*, *idGraph*, *idTrace*, *idPoint*, *deleteFromMaster=False*)
Remove element from the graph, or the master collection

remove_elements_from_trace(*self*, *idGraph*, *idTrace*, *idPoints*, *deleteFromMaster=False*)
Performances optimisation when compared to *LinkDataGraph.remove_element_from_graph()*

link_collection_to_graph_collection(*self*, *id_collection_graph*, *id_collection_master*)
Link data :param id_collection_graph: :param id_collection_master: :return:

remove_trace(*self*, *idGraph*, *idTrace*)

get_graph_and_trace_from_collection(*self*, *idCollection*)
Reverse search: from a collection, get the associated graph

get_mappingData_graph(*self*, *idGraph*)

get_mappingData_trace(*self*, *idGraph*, *idTrace*)

class text_format

PURPLE = [95m

CYAN = [96m

DARKCYAN = [36m

BLUE = [94m

GREEN = [92m

YELLOW = [93m

WHITE = [30m

RED = [91m

BOLD = [1m

UNDERLINE = [4m

END = [0m

class Options

get_name(*self*, *idOption*)

get_value(*self*, *idOption*)

add_option(*self*, *idOption*, *name*, *value*)

set_option(*self*, *idOption*, *value*)

copy(*self*)

set_self(*self*, *the_options*)

__str__(*self*)

class Option_class

get_optionValue(*self*, *optionId*)

set_optionValue(*self*, *optionId*, *value*)

get_all_options(*self*)

set_all_options(*self*, *options*)

add_option(*self*, *idOption*, *name*, *value*)

optimize

Subpackages

characterization

characterization

Module Contents

class Characterization
Bases: *optimeed.optimize.characterization.interfaceCharacterization.InterfaceCharacterization*

compute(*self*, *theDevice*)

interfaceCharacterization

Module Contents

class InterfaceCharacterization
Bases: *optimeed.core.options.Option_class*

Interface for the evaluation of a device

__str__(*self*)

Package Contents

class InterfaceCharacterization
Bases: *optimeed.core.options.Option_class*

Interface for the evaluation of a device

__str__(*self*)

class Characterization
Bases: *optimeed.optimize.characterization.interfaceCharacterization.InterfaceCharacterization*

compute(*self*, *theDevice*)

mathsToPhysics

interfaceMathsToPhysics

Module Contents

class InterfaceMathsToPhysics
Bases: *optimeed.core.options.Option_class*

Interface to transform output from the optimizer to meaningful variables of the device

mathsToPhysics

Module Contents

class MathsToPhysics
Bases: *optimeed.optimize.mathsToPhysics.interfaceMathsToPhysics.InterfaceMathsToPhysics*

Dummy yet powerful example of maths to physics. The optimization variables are directly injected to the device

fromMathsToPhys(*self*, *xVector*, *theDevice*, *theOptimizationVariables*)

fromPhysToMaths(*self*, *theDevice*, *theOptimizationVariables*)

__str__(*self*)

Package Contents

class MathsToPhysics
Bases: *optimeed.optimize.mathsToPhysics.interfaceMathsToPhysics.InterfaceMathsToPhysics*

Dummy yet powerful example of maths to physics. The optimization variables are directly injected to the device

fromMathsToPhys(*self*, *xVector*, *theDevice*, *theOptimizationVariables*)

fromPhysToMaths(*self*, *theDevice*, *theOptimizationVariables*)

__str__(*self*)

class InterfaceMathsToPhysics
Bases: *optimeed.core.options.Option_class*

Interface to transform output from the optimizer to meaningful variables of the device

objAndCons

fastObjCons

Module Contents

class FastObjCons(*constraintEquation*, *name=None*)
Bases: *optimeed.optimize.objAndCons.interfaceObjCons.InterfaceObjCons*

Convenience class to create an objective or a constraint very fast.

compute(*self*, *theDevice*)

get_name(*self*)

interfaceObjCons

Module Contents

class InterfaceObjCons
Bases: *optimeed.core.options.Option_class*

Interface class for objectives and constraints. The objective is to MINIMIZE and the constraint has to respect VALUE <= 0

get_name (*self*)

__str__ (*self*)

Package Contents

class FastObjCons (*constraintEquation*, *name=None*)
Bases: *optimeed.optimize.objAndCons.interfaceObjCons.InterfaceObjCons*

Convenience class to create an objective or a constraint very fast.

compute (*self*, *theDevice*)

get_name (*self*)

class InterfaceObjCons
Bases: *optimeed.core.options.Option_class*

Interface class for objectives and constraints. The objective is to MINIMIZE and the constraint has to respect VALUE <= 0

get_name (*self*)

__str__ (*self*)

optiAlgorithms

Subpackages

convergence

evolutionaryConvergence

Module Contents

class EvolutionaryConvergence (*is_monobj=False*)
Bases: *optimeed.optimize.optiAlgorithms.convergence.interfaceConvergence.InterfaceConvergence*

convergence class for population-based algorithm

objectives_per_step :Dict[int, List[List[float]]]

constraints_per_step :Dict[int, List[List[float]]]

is_monobj :bool

set_points_at_step (*self*, *theStep*, *theObjectives_list*, *theConstraints_list*)

get_pareto_convergence (*self*)

get_last_pareto(*self*)

get_hypervolume_convergence(*self*, *refPoint=None*)
Get the hypervolume indicator on each step

Parameters **refPoint** – Reference point needed to compute the hypervolume. If None is specified, uses the nadir point Example: [10, 10] for two objectives.

Returns

get_nb_objectives(*self*)

get_nadir_point(*self*)

get_nadir_point_all_steps(*self*)

get_nb_steps(*self*)

get_population_size(*self*)

get_graphs(*self*)

hypervolume

Module Contents

__author__ = Simon Wessing

class HyperVolume(*referencePoint*)
Hypervolume computation based on variant 3 of the algorithm in the paper: C. M. Fonseca, L. Paquete, and M. Lopez-Ibanez. An improved dimension-sweep algorithm for the hypervolume indicator. In IEEE Congress on Evolutionary Computation, pages 1157-1163, Vancouver, Canada, July 2006.

Minimization is implicitly assumed here!

compute(*self*, *front*)
Returns the hypervolume that is dominated by a non-dominated front.

Before the HV computation, front and reference point are translated, so that the reference point is [0, . . . , 0].

hvRecursive(*self*, *dimIndex*, *length*, *bounds*)
Recursive call to hypervolume calculation.

In contrast to the paper, the code assumes that the reference point is [0, . . . , 0]. This allows the avoidance of a few operations.

preProcess(*self*, *front*)
Sets up the list data structure needed for calculation.

sortByDimension(*self*, *nodes*, *i*)
Sorts the list of nodes by the i-th value of the contained points.

class MultiList(*numberLists*)
A special data structure needed by FonsecaHyperVolume.

It consists of several doubly linked lists that share common nodes. So, every node has multiple predecessors and successors, one in every list.

class Node(*numberLists*, *cargo=None*)

__str__(*self*)

__str__ (*self*)

__len__ (*self*)
Returns the number of lists that are included in this MultiList.

getLength (*self*, *i*)
Returns the length of the i-th list.

append (*self*, *node*, *index*)
Appends a node to the end of the list at the given index.

extend (*self*, *nodes*, *index*)
Extends the list at the given index with the nodes.

remove (*self*, *node*, *index*, *bounds*)
Removes and returns 'node' from all lists in [0, 'index'[.

reinsert (*self*, *node*, *index*, *bounds*)
Inserts 'node' at the position it had in all lists in [0, 'index'[before it was removed. This method assumes that the next and previous nodes of the node that is reinserted are in the list.

interfaceConvergence

Module Contents

class InterfaceConvergence
Simple interface to visually get the convergence of any optimization problem

Package Contents

class EvolutionaryConvergence (*is_monobj=False*)
Bases: *optimeed.optimize.optiAlgorithms.convergence.interfaceConvergence.InterfaceConvergence*

convergence class for population-based algorithm

objectives_per_step :Dict[int, List[List[float]]]

constraints_per_step :Dict[int, List[List[float]]]

is_monobj :bool

set_points_at_step (*self*, *theStep*, *theObjectives_list*, *theConstraints_list*)

get_pareto_convergence (*self*)

get_last_pareto (*self*)

get_hypervolume_convergence (*self*, *refPoint=None*)
Get the hypervolume indicator on each step

Parameters **refPoint** – Reference point needed to compute the hypervolume. If None is specified, uses the nadir point Example: [10, 10] for two objectives.

Returns

get_nb_objectives (*self*)

get_nadir_point (*self*)

get_nadir_point_all_steps (*self*)

get_nb_steps(*self*)

get_population_size(*self*)

get_graphs(*self*)

class InterfaceConvergence
Simple interface to visually get the convergence of any optimization problem

NLOpt_Algorithm

Module Contents

class ConvergenceManager

add_point(*self*, *newObj*)

set_pop_size(*self*, *popSize*)

class NLOpt_Algorithm
Bases: *optimeed.optimize.optiAlgorithms.algorithmInterface.AlgorithmInterface*

ALGORITHM = 0

POPULATION_SIZE = 1

compute(*self*, *initialVectorGuess*, *listOfOptimizationVariables*)

set_evaluationFunction(*self*, *evaluationFunction*, *callback_on_evaluate*, *numberOfObjectives*, *_numberOfConstraints*)

set_maxtime(*self*, *maxTime*)

__str__(*self*)

get_convergence(*self*)

algorithmInterface

Module Contents

class AlgorithmInterface
Bases: *optimeed.core.options.Option_class*

Interface for the optimization algorithm

reset(*self*)

multiObjective_GA

Module Contents

class MyConvergence(**args*, ***kwargs*)
Bases: *optimeed.optimize.optiAlgorithms.convergence.InterfaceConvergence*, optimeed.optimize.optiAlgorithms.platypus.core.Archive

conv :EvolutionaryConvergence

extend(*self*, *solutions*)

get_graphs(*self*)

class MyProblem(*theOptimizationVariables*, *nbr_objectives*, *nbr_constraints*, *evaluationFunction*)
Bases: optimeed.optimize.optiAlgorithms.platypus.core.Problem

Automatically sets the optimization problem

evaluate(*self*, *solution*)

class MyGenerator(*initialVectorGuess*)
Bases: optimeed.optimize.optiAlgorithms.platypus.Generator

Population generator to insert initial individual

generate(*self*, *problem*)

class MyTerminationCondition(*maxTime*)
Bases: optimeed.optimize.optiAlgorithms.platypus.core.TerminationCondition

initialize(*self*, *algorithm*)

shouldTerminate(*self*, *algorithm*)

class MyMapEvaluator(*callback_on_evaluation*)
Bases: optimeed.optimize.optiAlgorithms.platypus.evaluator.Evaluator

evaluate_all(*self*, *jobs*, ***kwargs*)

class MyMultiprocessEvaluator(*callback_on_evaluation*, *numberOfCores*)
Bases: optimeed.optimize.optiAlgorithms.platypus.evaluator.Evaluator

evaluate_all(*self*, *jobs*, ***kwargs*)

close(*self*)

class MultiObjective_GA
Bases: *optimeed.optimize.optiAlgorithms.algorithmInterface.AlgorithmInterface*

Based on Platypus Library. Workflow: Define what to optimize and which function to call with a Problem Define the initial population with a Generator Define the algorithm. As options, define how to evaluate the elements with a Evaluator, i.e., for multiprocessing. Define what is the termination condition of the algorithm with TerminationCondition. Here, termination condition is a maximum time.

DIVISION_OUTER = 0

OPTI_ALGORITHM = 1

NUMBER_OF_CORES = 2

compute(*self*, *initialVectorGuess*, *listOfOptimizationVariables*)

set_evaluationFunction(*self*, *evaluationFunction*, *callback_on_evaluation*, *numberOfObjectives*, *numberOfConstraints*)

set_maxtime(*self*, *maxTime*)

__str__(*self*)

get_convergence(*self*)

Package Contents

class MultiObjective_GA
Bases: *optimeed.optimize.optiAlgorithms.algorithmInterface.AlgorithmInterface*

Based on Platypus Library. Workflow: Define what to optimize and which function to call with a `Problem` Define the initial population with a `Generator` Define the algorithm. As options, define how to evaluate the elements with a `Evaluator`, i.e., for multiprocessing. Define what is the termination condition of the algorithm with `TerminationCondition`. Here, termination condition is a maximum time.

DIVISION_OUTER = 0

OPTI_ALGORITHM = 1

NUMBER_OF_CORES = 2

compute(*self*, *initialVectorGuess*, *listOfOptimizationVariables*)

set_evaluationFunction(*self*, *evaluationFunction*, *callback_on_evaluation*, *numberOfObjectives*, *numberOfConstraints*)

set_maxtime(*self*, *maxTime*)

__str__(*self*)

get_convergence(*self*)

optiVariable

Module Contents

class OptimizationVariable(*attributeName*)
Contains information about the optimization of a variable

get_attribute_name(*self*)
Return the attribute to set

get_PhysToMaths(*self*, *deviceIn*)
Convert the initial value of the variable contained in the device to optimization variable value

Parameters **deviceIn** – `InterfaceDevice`

Returns value of the corresponding optimization variable

do_MathsToPhys(*self*, *variableValue*, *deviceIn*)
Apply the value to the device

__str__(*self*)

class Real_OptimizationVariable(*attributeName*, *val_min*, *val_max*)
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Real (continuous) optimization variable. Most used type

get_min_value(*self*)

get_max_value(*self*)

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

class Binary_OptimizationVariable
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Boolean (True/False) optimization variable.

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

class Integer_OptimizationVariable(*attributeName*, *val_min*, *val_max*)
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Integer variable, in [min_value, max_value]

get_min_value(*self*)

get_max_value(*self*)

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

optimizer

Module Contents

default

class PipeOptimization
Provides a live interface of the current optimization

get_device(*self*)

Returns *InterfaceDevice* (not process safe, deprecated)

get_historic(*self*)

Returns *OptiHistoric*

set_device(*self*, *theDevice*)

set_historic(*self*, *theHistoric*)

class OptiHistoric(***kwargs*)
Bases: `object`

Contains all the points that have been evaluated

class _pointData(*currTime*, *objectives*, *constraints*)

time :float

objectives :List[float]

constraints :List[float]

_DEVICE = autosaved

_LOGOPTI = logopti

_RESULTS = results

_CONVERGENCE = optiConvergence

add_point(*self*, *device*, *currTime*, *objectives*, *constraints*)

set_results(*self*, *devicesList*)

set_convergence(*self*, *theConvergence*)

set_info(*self*, *theInfo*)

save(*self*)

get_results(*self*)

get_convergence(*self*)

Returns convergence *InterfaceConvergence*

get_devices(*self*)

Returns List of devices (ordered by evaluation number)

get_logopti(*self*)

Returns Log optimization (to check the convergence)

class Optimizer

Bases: *optimeed.core.options.Option_class*

Main optimizing class

DISPLAY_INFO = 1

KWARGS_OPTIHISTO = 2

set_optimizer(*self, theDevice, theObjectiveList, theConstraintList, theOptimizationVariables, theOptimizationAlgorithm=default['Algo'], theCharacterization=default['Charac'], theMathsToPhysics=default['M2P']*)

Prepare the optimizer for the optimization.

Parameters

- **theDevice** – object of type *InterfaceDevice*
- **theCharacterization** – object of type *InterfaceCharacterization*
- **theMathsToPhysics** – object of type *InterfaceMathsToPhysics*
- **theObjectiveList** – list of objects of type *InterfaceObjCons*
- **theConstraintList** – list of objects of type *InterfaceObjCons*
- **theOptimizationAlgorithm** – list of objects of type *AlgorithmInterface*
- **theOptimizationVariables** – list of objects of type *OptimizationVariable*

Returns *PipeOptimization*

run_optimization(*self*)

Perform the optimization.

Returns `Collection` of the best optimized machines

set_max_opti_time(*self*, *max_time_sec*)

evaluateObjectiveAndConstraints (*self*, *x*)
Evaluates the performances of machine associated to entrance vector x. Outputs the objective function and the constraints, and other data used in optiHistoric.

This function is NOT process safe: "self." is actually a FORK in multiprocessing algorithms. It means that the motor originally contained in self. is modified only in the fork, and only gathered by reaching the end of the fork. It is not (yet?) possible to access this motor on the main process before the end of the fork. This behaviour could be changed by using pipes or Managers.

Parameters **x** – Input mathematical vector from optimization algorithm

Returns dictionary, containing objective values (list of scalar), constraint values (list of scalar), and other info (motor, time)

callback_on_evaluation (*self*, *returnedValues*)
Save the output of evaluateObjectiveAndConstraints to optiHistoric. This function should be called by the optimizer IN a process safe context.

formatInfo (*self*)

Package Contents

class InterfaceCharacterization
Bases: *optimeed.core.options.Option_class*

Interface for the evaluation of a device

__str__ (*self*)

class Characterization
Bases: *optimeed.optimize.characterization.interfaceCharacterization.InterfaceCharacterization*

compute (*self*, *theDevice*)

class MathsToPhysics
Bases: *optimeed.optimize.mathsToPhysics.interfaceMathsToPhysics.InterfaceMathsToPhysics*

Dummy yet powerful example of maths to physics. The optimization variables are directly injected to the device

fromMathsToPhys (*self*, *xVector*, *theDevice*, *theOptimizationVariables*)

fromPhysToMaths (*self*, *theDevice*, *theOptimizationVariables*)

__str__ (*self*)

class InterfaceMathsToPhysics
Bases: *optimeed.core.options.Option_class*

Interface to transform output from the optimizer to meaningful variables of the device

class FastObjCons (*constraintEquation*, *name=None*)
Bases: *optimeed.optimize.objAndCons.interfaceObjCons.InterfaceObjCons*

Convenience class to create an objective or a constraint very fast.

compute (*self*, *theDevice*)

get_name (*self*)

class InterfaceObjCons
Bases: *optimeed.core.options.Option_class*

Interface class for objectives and constraints. The objective is to MINIMIZE and the constraint has to respect VALUE <= 0

get_name(*self*)

__str__(*self*)

class MultiObjective_GA
Bases: *optimeed.optimize.optiAlgorithms.algorithmInterface.AlgorithmInterface*

Based on Platypus Library. Workflow: Define what to optimize and which function to call with a `Problem` Define the initial population with a `Generator` Define the algorithm. As options, define how to evaluate the elements with a `Evaluator`, i.e., for multiprocessing. Define what is the termination condition of the algorithm with `TerminationCondition`. Here, termination condition is a maximum time.

DIVISION_OUTER = 0

OPTI_ALGORITHM = 1

NUMBER_OF_CORES = 2

compute(*self*, *initialVectorGuess*, *listOfOptimizationVariables*)

set_evaluationFunction(*self*, *evaluationFunction*, *callback_on_evaluation*, *numberOfObjectives*, *numberOfConstraints*)

set_maxtime(*self*, *maxTime*)

__str__(*self*)

get_convergence(*self*)

class Real_OptimizationVariable(*attributeName*, *val_min*, *val_max*)
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Real (continuous) optimization variable. Most used type

get_min_value(*self*)

get_max_value(*self*)

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

class Binary_OptimizationVariable
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Boolean (True/False) optimization variable.

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

class Integer_OptimizationVariable(*attributeName*, *val_min*, *val_max*)
Bases: *optimeed.optimize.optiVariable.OptimizationVariable*

Integer variable, in [min_value, max_value]

get_min_value(*self*)

get_max_value(*self*)

get_PhysToMaths(*self*, *deviceIn*)

do_MathsToPhys(*self*, *value*, *deviceIn*)

__str__(*self*)

class Optimizer

Bases: *optimeed.core.options.Option_class*

Main optimizing class

DISPLAY_INFO = 1

KWARGS_OPTIHISTO = 2

set_optimizer(*self, theDevice, theObjectiveList, theConstraintList, theOptimizationVariables, theOptimizationAlgorithm=default['Algo'], theCharacterization=default['Charac'], theMathsToPhysics=default['M2P']*)

Prepare the optimizer for the optimization.

Parameters

- **theDevice** – object of type *InterfaceDevice*
- **theCharacterization** – object of type *InterfaceCharacterization*
- **theMathsToPhysics** – object of type *InterfaceMathsToPhysics*
- **theObjectiveList** – list of objects of type *InterfaceObjCons*
- **theConstraintList** – list of objects of type *InterfaceObjCons*
- **theOptimizationAlgorithm** – list of objects of type *AlgorithmInterface*
- **theOptimizationVariables** – list of objects of type *OptimizationVariable*

Returns `PipeOptimization`

run_optimization(*self*)

Perform the optimization.

Returns `Collection` of the best optimized machines

set_max_opti_time(*self*, *max_time_sec*)

evaluateObjectiveAndConstraints(*self*, *x*)

Evaluates the performances of machine associated to entrance vector x. Outputs the objective function and the constraints, and other data used in optiHistoric.

This function is NOT process safe: "self." is actually a FORK in multiprocessing algorithms. It means that the motor originally contained in self. is modified only in the fork, and only gathered by reaching the end of the fork. It is not (yet?) possible to access this motor on the main process before the end of the fork. This behaviour could be changed by using pipes or Managers.

Parameters **x** – Input mathematical vector from optimization algorithm

Returns dictionary, containing objective values (list of scalar), constraint values (list of scalar), and other info (motor, time)

callback_on_evaluation(*self*, *returnedValues*)

Save the output of evaluateObjectiveAndConstraints to optiHistoric. This function should be called by the optimizer IN a process safe context.

formatInfo(*self*)

visualize

Subpackages

gui

Subpackages

widgets

Subpackages

graphsVisualWidget

Subpackages

examplesActionOnClick

on_click_anim

Module Contents

class DataAnimationOpenGL(*theOpenGLWidget*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements `DataAnimationVisuals` to show opengl drawing

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

class DataAnimationOpenGLwText(**args*, *is_light=True*, ***kwargs*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationOpenGL*

Implements `DataAnimationVisuals` to show opengl drawing and text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationLines(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements `DataAnimationVisuals` to show drawing made out of lines (*widget_line_drawer*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationVisualswText(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationLines*

Same as *DataAnimationLines* but also with text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

class on_graph_click_showAnim(*theLinkDataGraph*, *theAnimation*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: add or remove an element to animate

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

on_click_change_symbol

Module Contents

class on_click_change_symbol(*theLinkDataGraph*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Change the symbol of the point that is clicked

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

on_click_copy_something

Module Contents

class on_click_copy_something(*theDataLink*, *functionStrFromDevice*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: copy something

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

on_click_delete

Module Contents

class delete_gui
Bases: `PyQt5.QtWidgets.QMainWindow`

class on_graph_click_delete(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Delete the points from the graph, and save the modified collection

apply(*self*)

reset(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

on_click_export_collection

Module Contents

class on_graph_click_export(*theDataLink*)

Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: export the selected points

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

reset_graph(*self*)

get_name(*self*)

on_click_extract_pareto

Module Contents

class on_click_extract_pareto(*theDataLink*, *max_x=False*, *max_y=False*)

Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: extract the pareto from the cloud of points

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, _)

get_name(*self*)

on_click_remove_trace

Module Contents

class on_graph_click_remove_trace(*theDataLink*)

Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, _)

get_name(*self*)

on_click_showinfo

Module Contents

class on_graph_click_showInfo(*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual(*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class Repr_lines(*attribute_lines*)

get_widget(*self*, *theNewDevice*)

class Repr_opengl(*DeviceDrawer*)

get_widget(*self*, *theNewDevice*)

Package Contents

class on_graph_click_delete(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Delete the points from the graph, and save the modified collection

apply(*self*)

reset(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_export(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: export the selected points

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

reset_graph(*self*)

get_name(*self*)

class on_click_extract_pareto(*theDataLink*, *max_x=False*, *max_y=False*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: extract the pareto from the cloud of points

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_graph_click_showInfo(*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual(*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class Repr_opengl(*DeviceDrawer*)

get_widget(*self*, *theNewDevice*)

class Repr_lines(*attribute_lines*)

get_widget(*self*, *theNewDevice*)

class on_graph_click_remove_trace(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_click_copy_something(*theDataLink*, *functionStrFromDevice*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: copy something

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_click_change_symbol(*theLinkDataGraph*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Change the symbol of the point that is clicked

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_interface
Interface class for the action to perform when a point is clicked

class DataAnimationVisuals(*id=0*, *window_title='Animation'*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace(*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]
- **theTrace** – `TraceVisual`

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, *_*)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: `PyQt5.QtWidgets.QLabel`

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: PyQt5.QtWidgets.QWidget

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

class DataAnimationOpenGL(*theOpenGLWidget*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show opengl drawing

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

class DataAnimationOpenGLwText(**args*, *is_light=True*, ***kwargs*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationOpenGL*

Implements *DataAnimationVisuals* to show opengl drawing and text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationLines(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show drawing made out of lines (*widget_line_drawer*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationVisualswText(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationLines*

Same as *DataAnimationLines* but also with text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

class on_graph_click_showAnim(*theLinkDataGraph*, *theAnimation*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: add or remove an element to animate

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

graphVisual

Module Contents

class GraphVisual(*theWidgetGraphVisual*)

Provide an interface to a graph. A graph contains traces.

set_fontTicks(*self*, *fontSize*, *fontname=None*)

Set font of the ticks

Parameters

- **fontSize** – Size of the font
- **fontname** – Name of the font

set_numberTicks(*self*, *number*, *axis*)

Set the number of ticks to be displayed

Parameters

- **number** – Number of ticks for the axis
- **axis** – Axis (string, "bottom", "left", "right", "top")

Returns

set_fontLabel(*self*, *fontSize*, *color='#000'*, *fontname=None*)

Set font of the axis labels

Parameters

- **fontSize** – font size
- **color** – color in hexadecimal (str)
- **fontname** – name of the font

get_legend(*self*)

Get the legend

get_axis(*self*, *axis*)

Get the axis

Parameters **axis** – Axis (string, "bottom", "left", "right", "top")

Returns axis object

set_fontLegend(*self*, *font_size*, *font_color*, *fontname=None*)

set_label_pos(*self*, *orientation*, *x_offset=0*, *y_offset=0*)

set_color_palette(*self*, *palette*)

apply_palette(*self*)

hide_axes(*self*)

add_feature(*self*, *theFeature*)

To add any pyqtgraph item to the graph

remove_feature(*self*, *theFeature*)
To remove any pyqtgraph item from the graph

add_data(*self*, *idGraph*, *theColor*, *theData*)

set_graph_properties(*self*, *theTrace*)
This function is automatically called on creation of the graph

set_lims(*self*, *xlim*, *ylim*)
Set limits of the graphs, xlim or ylim = [val_low, val_high]. Or None.

add_trace(*self*, *idTrace*, *theTrace*)
Add a `TraceVisual` to the graph, with index idTrace

set_legend(*self*)
Set default legend options (color and font)

set_title(*self*, *titleName*, ***kwargs*)
Set title of the graph

Parameters **titleName** – title to set

get_trace(*self*, *idTrace*)
Return the `TraceVisual` correspondong to the index idTrace

get_all_traces(*self*)
Return a dictionary {idtrace: `TraceVisual`}.

delete_trace(*self*, *idTrace*)
Delete the trace of index idTrace

delete(*self*)
Delete the graph

linkXToGraph(*self*, *graph*)
Link the axis of the current graph to an other *GraphVisual*

update(*self*)
Update the traces contained in the graph

fast_update(*self*)
Same as *update()* but faster. This is NOT thread safe (cannot be called a second time before finishing operation)

axis_equal(*self*)

grid_off(*self*)
Turn off grid

pyqtgraphRedefine

Module Contents

isOnWindows
Other modified files (directly): ScatterPlotItem.py, to change point selection. Ctrl + clic: select area. Clic: only one single point

class myGraphicsLayoutWidget(*parent=None*, ***_kwargs*)
Bases: `optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.GraphicsView`

useOpenGL(*self*, *b=True*)
Overwrited to fix bad antialiasing while using openGL

class myGraphicsLayout
Bases: optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.GraphicsLayout

addItem(*self*, *item*, *row=None*, *col=None*, *rowspan=1*, *colspan=1*)
Add an item to the layout and place it in the next available cell (or in the cell specified). The item must be an instance of a QGraphicsWidget subclass.

set_graph_disposition(*self*, *item*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Function to modify the position of an item in the list

Parameters

- **item** – WidgetPlotItem to set
- **row** – Row
- **col** – Column
- **rowspan** –
- **colspan** –

Returns

class myItemSample(*item*)
Bases: optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.graphicsItems.LegendItem.ItemSample

set_offset(*self*, *offset*)

set_width_cell(*self*, *width*)

paint(*self*, *p*, **args*)
Overwrites to make matlab-like samples

class myLegend(*size=None*, *offset=(30*, *30)*, *is_light=False*)
Bases: optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.LegendItem

Legend that fixes bugs (flush left + space) from pyqtgraph's legend

set_space_sample_label(*self*, *theSpace*)
To set the gap between the sample and the label

set_offset_sample(*self*, *offset*)
To tune the offset between the sample and the text

set_width_cell_sample(*self*, *width*)
Set width of sample

updateSize(*self*)

addItem(*self*, *item*, *name*)
Overwrites to flush left

apply_width_sample(*self*)

set_font(*self*, *font_size*, *font_color*, *fontname=None*)

paint(*self*, *p*, **args*)
Overwrited to select background color

set_position (*self*, *position*, *offset*)
Set the position of the legend, in a corner.

Parameters

- **position** – String (NW, NE, SW, SE), indicates which corner the legend is close
- **offset** – Tuple (xoff, yoff), x and y offset from the edge

Returns

class myLabelItem
Bases: optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.LabelItem

setText (*self*, *text*, ***args*)
Overwrited to add font-family to options

class myAxis (*orientation*)
Bases: optimeed.visualize.gui.widgets.graphsVisualWidget.pyqtgraph.AxisItem

get_label_pos (*self*)
Overwrited to place label closer to the axis

resizeEvent (*self*, *ev=None*)
Overwrited to place label closer to the axis

set_label_pos (*self*, *orientation*, *x_offset=0*, *y_offset=0*)

set_number_ticks (*self*, *number*)

smallGui

Module Contents

class guiPyqtgraph (*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList (*self*)
Refresh all the traces

traceVisual

Module Contents

class TraceVisual (*theColor*, *theData*, *theWGPlot*, *highlight_last*)
Bases: PyQt5.QtCore.QObject

Defines a trace in a graph.

class _ModifiedPaintElem
Hidden class to manage brushes or pens

add_modified_paintElem (*self*, *index*, *newPaintElem*)

modify_paintElems (*self*, *paintElemsIn_List*)
Apply transformation to paintElemsIn_List
Parameters **paintElemsIn_List** – list of brushes or pens to modify
Returns False if nothing has been modified, True is something has been modified

reset_paintElem(*self*, *index*)
Remove transformation of point index

reset(*self*)

signal_must_update

hide_points(*self*)
Hide all the points

get_color(*self*)
Get colour of the trace, return tuple (r,g,b)

set_color(*self*, *color*)
Set colour of the trace, argument as tuple (r,g,b)

get_base_symbol_brush(*self*)
Get symbol brush configured for this trace, return `pg.QBrush`

get_base_pen(*self*)
Get pen configured for this trace, return `pg.QPen`

get_base_symbol_pen(*self*)
Get symbol pen configured for this trace, return `pg.QPen`

get_base_symbol(*self*)
Get base symbol configured for this trace, return str of the symbol (e.g. 'o')

get_symbol(*self*, *size*)
Get actual symbols for the trace. If the symbols have been modified: return a list which maps each points to a symbol. Otherwise: return :meth:TraceVisual.get_base_symbol()

updateTrace(*self*)
Forces the trace to refresh.

get_length(*self*)
Return number of data to plot

hide(*self*)
Hides the trace

show(*self*)
Shows the trace

toggle(*self*, *boolean*)
Toggle the trace (hide/show)

get_data(*self*)
Get data to plot `Data`

get_brushes(*self*, *size*)
Get actual brushes for the trace (=symbol filling). return a list which maps each points to a symbol brush

set_brush(*self*, *indexPoint*, *newbrush*, *update=True*)
Set the symbol brush for a specific point:

Parameters

- **indexPoint** – Index of the point (in the graph) to modify
- **newbrush** – either QBrush or tuple (r, g, b) of the new brush
- **update** – if True, update the trace afterwards. This is slow operation.

set_symbol (*self*, *indexPoint*, *newSymbol*, *update=True*)
Set the symbol shape for a specific point:

Parameters

- **indexPoint** – Index of the point (in the graph) to modify
- **newSymbol** – string of the new symbol (e.g.: 'o')
- **update** – if True, update the trace afterwards. This is slow operation.

set_brushes (*self*, *list_indexPoint*, *list_newbrush*)
Same as *set_brush()* but by taking a list as input

reset_brush (*self*, *indexPoint*, *update=True*)
Reset the brush of the point indexpoint

reset_all_brushes (*self*)
Reset all the brushes

reset_symbol (*self*, *indexPoint*, *update=True*)
Reset the symbol shape of the point indexpoint

get_symbolPens (*self*, *size*)
Get actual symbol pens for the trace (=symbol outline). return a list which maps each points to a symbol pen

set_symbolPen (*self*, *indexPoint*, *newPen*, *update=True*)
Set the symbol shape for a specific point:

Parameters

- **indexPoint** – Index of the point (in the graph) to modify
- **newPen** – QPen item or tuple of the color (r,g,b)
- **update** – if True, update the trace afterwards. This is slow operation.

set_symbolPens (*self*, *list_indexPoint*, *list_newpens*)
Same as *set_symbolPen()* but by taking a list as input

reset_symbolPen (*self*, *indexPoint*)
Reset the symbol pen of the point indexpoint

reset_all_symbolPens (*self*)
Reset all the symbol pens

openGLWidget

ContextHandler

Module Contents

MODE_ZOOM = 0

MODE_ROTATION = 1

MODE_LIGHT = 2

NUMBER_OF_MODES = 3

CLIC_LEFT = 0

CLIC_RIGHT = 1

class SpecialButtonsMapping

class MyText(*color*, *fontSize*, *theStr*, *windowPosition*)

class ContextHandler

set_specialButtonsMapping(*self*, *theSpecialButtonsMapping*)

set_deviceDrawer(*self*, *theDeviceDrawer*)

set_deviceToDraw(*self*, *theDeviceToDraw*)

resizeWindowAction(*self*, *new_width*, *new_height*)

mouseWheelAction(*self*, *deltaAngle*)

mouseClicAction(*self*, *button*, *my_x*, *y*)

mouseMotionAction(*self*, *my_x*, *y*)

keyboardPushAction(*self*, *key*)

keyboardReleaseAction(*self*, *key*, *my_x*, *y*)

__draw_axis__(*self*)

redraw(*self*)

get_text_to_write(*self*)

__lightingInit__(*self*)

initialize(*self*)

__reset__(*self*)

DeviceDrawerInterface

Module Contents

class DeviceDrawerInterface

keyboard_push_action(*self*, *theKey*)

get_colour_scalebar(*self*)

get_colour_background(*self*)

get_opengl_options(*self*)

Materials_visual

Module Contents

class MaterialRenderingProperties(*amb3*, *dif3*, *spec3*, *shin*)

__spec3__ = [0, 0, 0, 0]

__dif3__ = [0, 0, 0, 0]

__amb3__ = [0, 0, 0, 0]

__shin__ = 0

getSpec3(*self*)

getDif3(*self*)

getAmb3(*self*)

getShin(*self*)

activateMaterialProperties(*self*, *alpha=1*)

Emerald_material

Yellow_Emerald_material

Brass_material

Bronze_material

Silver_material

Steel_material

Copper_material

Chrome_material

Blue_material

Red_material

OpenGlFunctions_Library

Module Contents

draw_closedPolygon(*xClockWise*, *yClockWise*)

draw_extrudeZ(*xList*, *yList*, *zExtrude*)

draw_triList(*theTriList*)

draw_lines(*x*, *z*)

draw_spiralSheet(*innerRadius*, *thickness*, *length*, *theAngle*, *n*, *reverseDirection=False*)

draw_spiralFront(*innerRadius*, *thicknessMaterial*, *thicknessSpiral*, *z0*, *theAngle*, *n*, *reverseDirection=False*)

draw_spiralFull(*innerRadius*, *outerRadius*, *thicknessMaterial*, *thicknessSpiral*, *length*, *n*)

draw_spiral(*innerRadius*, *outerRadius*, *thicknessMaterial*, *thicknessSpiral*, *length*, *cutAngle*, *n*)

draw_simple_rectangle(*width*, *height*)

draw_rectangle(*rIn*, *length*, *thickness*, *angle*, *reverseDirection=False*)

draw_2Dring(*innerRadius*, *outerRadius*, *z0*, *theAngle*, *n*, *reverseDirection=False*)

draw_2Dring_diff_angle(*innerRadius*, *outerRadius*, *angle_in*, *angle_out*, *n*, *reverseDirection=False*)

draw_tubeSheet(*radius*, *length*, *theAngle*, *n*, *reverseDirection=False*)

draw_cylinder(*innerRadius*, *outerRadius*, *length*, *n*, *translate=0*)

draw_part_cylinder(*innerRadius*, *outerRadius*, *length*, *angle*, *n*, *translate=0*, *drawSides=True*)

draw_disk(*innerRadius*, *outerRadius*, *n*, *translate=0*)

draw_part_disk(*innerRadius*, *outerRadius*, *thickness*, *angle*, *n*, *translate=0*)

draw_part_disk_diff_angles(*innerRadius*, *outerRadius*, *thickness*, *angle_in*, *angle_out*, *n*)

draw_carved_disk(*innerRadius*, *outerRadius*, *carvedRin*, *carvedRout*, *thickness*, *depth*, *angle*, *n*, *translate=0*)

draw_part_cylinder_throat(*rIn*, *rOut*, *rOutThroat*, *length*, *lengthThroat*, *angle*, *n*, *translate=0*)

drawWireTube(*diameter*, *xa*, *ya*, *xb*, *yb*, *n=50*, *translateZ=0*)

TriangulatePolygon

Module Contents

IsConvex(*a*, *b*, *c*)

InTriangle(*a*, *b*, *c*, *p*)

IsClockwise(*poly*)

GetEar(*poly*)

reformatXYtoList(*xList*, *yList*)

meshPolygon(*xList*, *yList*)

quaternions

Module Contents

normalize(*v*, *tolerance=0.001*)

q_mult(*q1*, *q2*)

q_conjugate(*q*)

qv_mult(*q1*, *v1*)

axisangle_to_q(*v*, *theta*)

q_to_axisangle(*q*)

q_to_mat4(*q*)

widget_graphs_visual

Module Contents

class on_graph_click_interface
: Interface class for the action to perform when a point is clicked

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update(*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs(*self*)
Export the graphs

link_axes(*self*)

get_graph(*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent(*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph(*self*, *idGraph*)
Delete the graph idGraph

delete(*self*)

get_all_graphsVisual(*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons(*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick(*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title(*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template(*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

widget_line_drawer

Module Contents

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: PyQt5.QtWidgets.QWidget

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

widget_menuButton

Module Contents

class widget_menuButton(*theParentButton*)
Bases: PyQt5.QtWidgets.QMenu

Same as QMenu, but integrates it behind a button more easily.

showEvent(*self*, *QShowEvent*)

widget_openGL

Module Contents

class widget_openGL(*parent=None*)
Bases: `PyQt5.QtWidgets.QOpenGLWidget`

Interface that provides opengl capabilities. Ensures zoom, light, rotation, etc.

sizeHint(*self*)

minimumSizeHint(*self*)

set_deviceDrawer(*self*, *theDeviceDrawer*)
Set a drawer *optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface.DeviceDrawerInterface*

set_deviceToDraw(*self*, *theDeviceToDraw*)
Set the device to draw `optimeed.InterfaceDevice.InterfaceDevice`

initializeGL(*self*)

paintGL(*self*)

resizeGL(*self*, *w*, *h*)

mousePressEvent(*self*, *event*)

mouseMoveEvent(*self*, *event*)

keyPressEvent(*self*, *event*)

wheelEvent(*self*, *QWheelEvent*)

widget_text

Module Contents

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: `PyQt5.QtWidgets.QLabel`

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class scrollable_widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: `PyQt5.QtWidgets.QWidget`

Same as *widget_text* but scrollable

set_text(*self*, *theText*, *convertToHtml=False*)

Package Contents

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update(*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs(*self*)
Export the graphs

link_axes(*self*)

get_graph(*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent(*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph(*self*, *idGraph*)
Delete the graph idGraph

delete(*self*)

get_all_graphsVisual(*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons(*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick(*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title(*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template(*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

class widget_menuButton(*theParentButton*)
Bases: `PyQt5.QtWidgets.QMenu`

Same as QMenu, but integrates it behind a button more easily.

showEvent(*self*, *QShowEvent*)

class widget_openGL(*parent=None*)
Bases: `PyQt5.QtWidgets.QOpenGLWidget`

Interface that provides opengl capabilities. Ensures zoom, light, rotation, etc.

sizeHint(*self*)

minimumSizeHint(*self*)

set_deviceDrawer(*self*, *theDeviceDrawer*)
Set a drawer *optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface.DeviceDrawerInterface*

set_deviceToDraw(*self*, *theDeviceToDraw*)
Set the device to draw `optimeed.InterfaceDevice.InterfaceDevice`

initializeGL(*self*)

paintGL(*self*)

resizeGL(*self*, *w*, *h*)

mousePressEvent(*self*, *event*)

mouseMoveEvent(*self*, *event*)

keyPressEvent(*self*, *event*)

wheelEvent(*self*, *QWheelEvent*)

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: `PyQt5.QtWidgets.QLabel`

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class on_graph_click_delete(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Delete the points from the graph, and save the modified collection

apply(*self*)

reset(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_export(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: export the selected points

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

reset_graph(*self*)

get_name(*self*)

class on_click_extract_pareto(*theDataLink*, *max_x=False*, *max_y=False*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: extract the pareto from the cloud of points

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_graph_click_showInfo(*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual(*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class Repr_opengl(*DeviceDrawer*)

get_widget(*self*, *theNewDevice*)

class Repr_lines(*attribute_lines*)

get_widget(*self*, *theNewDevice*)

class on_graph_click_remove_trace(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, _)

get_name(*self*)

class on_click_copy_something(*theDataLink*, *functionStrFromDevice*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: copy something

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_click_change_symbol(*theLinkDataGraph*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Change the symbol of the point that is clicked

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_interface
Interface class for the action to perform when a point is clicked

class DataAnimationVisuals(*id=0*, *window_title='Animation'*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace(*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]

- **theTrace** – TraceVisual

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, *_*)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: PyQt5.QtWidgets.QLabel

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: PyQt5.QtWidgets.QWidget

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

class DataAnimationOpenGL(*theOpenGLWidget*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show opengl drawing

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

class DataAnimationOpenGLwText(**args*, *is_light=True*, ***kwargs*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationOpenGL*

Implements *DataAnimationVisuals* to show opengl drawing and text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationLines(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show drawing made out of lines (*widget_line_drawer*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationVisualswText(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationLines*

Same as *DataAnimationLines* but also with text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

class on_graph_click_showAnim(*theLinkDataGraph*, *theAnimation*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: add or remove an element to animate

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class guiPyqtgraph(*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList(*self*)
Refresh all the traces

class DeviceDrawerInterface

keyboard_push_action(*self*, *theKey*)

get_colour_scalebar(*self*)

get_colour_background(*self*)

get_opengl_options(*self*)

gui_collection_exporter

Module Contents

class gui_collection_exporter
Bases: PyQt5.QtWidgets.QMainWindow

Simple gui that allows to export data

signal_has_exported

signal_has_reset

exportCollection(*self*)
Export the collection

reset(*self*)

add_data_to_collection(*self*, *data*)
Add data to the collection to export

Parameters **data** – Whichever type you like

set_info(*self*, *info*)

set_collection(*self*, *theCollection*)

gui_data_animation

Module Contents

class DataAnimationTrace(*elements_list*, *theTrace*)
Contains all the element to animate for a trace

class element_animation(*elements*)

get(*self*)

get_element_animations(*self*, *itemNumber*, *index_in_show*)
Get the element to show :param itemNumber: item number (0 if only one think to draw) :param index_in_show: index in the list :return: The element to draw

show_all(*self*)

delete_all(*self*)

get_indices_to_show(*self*)

add_element(*self*, *indexPoint*)

add_index_to_show(*self*, *index*)

_remove_index_from_show(*self*, *index*)

set_curr_brush(*self*, *index_in_show*)

set_idle_brush(*self*, *index_in_show*)

get_number_of_elements(*self*)

map_index(*self*, *index_in_show*)

get_base_pen(*self*)

class DataAnimationVisuals(*id=0*, *window_title='Animation'*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace(*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]
- **theTrace** – `TraceVisual`

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, *_*)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

gui_data_selector

Module Contents

app

class Action_on_selector_update

class Attribute_selector(*attribute_name*, *value*)

add_child(*self*, *child*)

get_children(*self*)

get_name(*self*)

get_min_max_attributes(*self*)

__str__(*self*)

class Container_attribute_selector(*containerName*)

add_child(*self*, *child*)

add_attribute_selector(*self*, *attribute_selector*)

set_attribute_selectors(*self*, *attribute_selectors*)

get_name(*self*)

get_children(*self*)

get_attribute_selectors(*self*)

__str__(*self*)

class GuiDataSelector(*collections_in: CollectionsToVisualise*, *actionOnUpdate: Action_on_selector_update*)

Bases: `PyQt5.QtWidgets.QMainWindow`

theActionOnUpdate

Generate GUI

apply_filters(*self*, *_*)

run(*self*)

is_object_selected(*container_in*, *object_in*)

check_and_add_if_float(*the_container*, *attribute_value*, *attribute_name*, *parent=None*)

manage_list(*the_container*, *in_object*, *_listOfValues*, *_listName*)

get_attr_object(*the_container*, *in_object*)

gui_mainWindow

Module Contents

app

start_qt_mainloop()

Starts qt mainloop, which is necessary for qt to handle events

stop_qt_mainloop()

Stops qt mainloop and resumes to program

class gui_mainWindow(*QtWidgetList*, *isLight=True*, *actionOnWindowClosed=None*, *neverCloseWindow=False*, *title_window='Awesome Visualisation Tool'*, *size=None*)

Bases: `PyQt5.QtWidgets.QMainWindow`

Main class that spawns a Qt window. Use *run()* to display it.

set_actionOnClose(*self*, *actionOnWindowClosed*)

closeEvent(*self*, *event*)

run (*self*, *hold=False*)
Display the window

keyPressEvent (*self*, *event*)

Package Contents

class gui_mainWindow (*QtWidgetList*, *isLight=True*, *actionOnWindowClosed=None*, *neverCloseWindow=False*, *title_window='Awesome Visualisation Tool'*, *size=None*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Main class that spawns a Qt window. Use *run()* to display it.

set_actionOnClose (*self*, *actionOnWindowClosed*)

closeEvent (*self*, *event*)

run (*self*, *hold=False*)
Display the window

keyPressEvent (*self*, *event*)

app

start_qt_mainloop ()
Starts qt mainloop, which is necessary for qt to handle events

stop_qt_mainloop ()
Stops qt mainloop and resumes to program

class gui_collection_exporter
Bases: `PyQt5.QtWidgets.QMainWindow`

Simple gui that allows to export data

signal_has_exported

signal_has_reset

exportCollection (*self*)
Export the collection

reset (*self*)

add_data_to_collection (*self*, *data*)
Add data to the collection to export

Parameters **data** – Whichever type you like

set_info (*self*, *info*)

set_collection (*self*, *theCollection*)

class DataAnimationVisuals (*id=0*, *window_title='Animation'*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace (*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]
- **theTrace** – `TraceVisual`

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, _)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update(*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs(*self*)
Export the graphs

link_axes(*self*)

get_graph(*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent(*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph(*self*, *idGraph*)
Delete the graph idGraph

delete(*self*)

get_all_graphsVisual(*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons(*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick(*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title(*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template(*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

class widget_menuButton(*theParentButton*)
Bases: `PyQt5.QtWidgets.QMenu`

Same as QMenu, but integrates it behind a button more easily.

showEvent(*self*, *QShowEvent*)

class widget_openGL(*parent=None*)
Bases: `PyQt5.QtWidgets.QOpenGLWidget`

Interface that provides opengl capabilities. Ensures zoom, light, rotation, etc.

sizeHint(*self*)

minimumSizeHint(*self*)

set_deviceDrawer(*self*, *theDeviceDrawer*)
Set a drawer *optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface.DeviceDrawerInterface*

set_deviceToDraw(*self*, *theDeviceToDraw*)
Set the device to draw `optimeed.InterfaceDevice.InterfaceDevice`

initializeGL(*self*)

paintGL(*self*)

resizeGL(*self*, *w*, *h*)

mousePressEvent(*self*, *event*)

mouseMoveEvent(*self*, *event*)

keyPressEvent(*self*, *event*)

wheelEvent(*self*, *QWheelEvent*)

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: `PyQt5.QtWidgets.QLabel`

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class guiPyqtgraph(*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList(*self*)
Refresh all the traces

class DeviceDrawerInterface

keyboard_push_action(*self*, *theKey*)

get_colour_scalebar(*self*)

get_colour_background(*self*)

get_opengl_options(*self*)

class on_graph_click_delete(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Delete the points from the graph, and save the modified collection

apply(*self*)

reset(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_export(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: export the selected points

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

reset_graph(*self*)

get_name(*self*)

class on_click_extract_pareto(*theDataLink*, *max_x=False*, *max_y=False*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: extract the pareto from the cloud of points

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_graph_click_showInfo(*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual(*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class Repr_opengl(*DeviceDrawer*)

get_widget(*self*, *theNewDevice*)

class Repr_lines(*attribute_lines*)

get_widget(*self*, *theNewDevice*)

class on_graph_click_remove_trace(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_click_copy_something(*theDataLink*, *functionStrFromDevice*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: copy something

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_click_change_symbol(*theLinkDataGraph*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Change the symbol of the point that is clicked

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_interface
Interface class for the action to perform when a point is clicked

class DataAnimationVisuals(*id=0*, *window_title='Animation'*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace(*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]
- **theTrace** – `TraceVisual`

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, *_*)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

class DataAnimationOpenGL(*theOpenGLWidget*, *theId=0*, *window_title='Animation'*)

Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show opengl drawing

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

class DataAnimationOpenGLwText(**args*, *is_light=True*, ***kwargs*)

Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationOpenGL*

Implements *DataAnimationVisuals* to show opengl drawing and text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationLines(*is_light=True*, *theId=0*, *window_title='Animation'*)

Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show drawing made out of lines (*widget_line_drawer*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationVisualswText(*is_light=True*, *theId=0*, *window_title='Animation'*)

Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationLines*

Same as *DataAnimationLines* but also with text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

class on_graph_click_showAnim(*theLinkDataGraph*, *theAnimation*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: add or remove an element to animate

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

displayOptimization

Module Contents

class OptimizationDisplayer(*thePipeOpti*, *listOfObjectives*, *theOptimizer*, *additionalWidgets=None*)
Class used to display optimization process in real time

signal_optimization_over

set_actionsOnClick(*self*, *theList*)
Set actions to perform on click, list of *on_graph_click_interface*

generate_optimizationGraphs(*self*, *refresh_time=0.1*)
Generates the optimization graphs. :return: *Graphs*, *LinkDataGraph*, :class:'~optimeed.visulaize.gui.widgets.widget_graphs_visual.widget_graphs_visual

create_main_window(*self*)
From the widgets and the actions on click, spawn a window and put a gui around widgetsGraphsVisual.

__change_appearance_violate_constraints(*self*)

__auto_refresh(*self*, *refresh_time*)

__set_graphs_disposition(*self*)
Set nicely the graphs disposition

launch_optimization(*self*)
Perform the optimization and spawn the convergence graphs afterwards.

__callback_optimization(*self*, *myWindow*)

class Worker
Bases: `PyQt5.QtCore.QObject`

signal_show_UI

display_graphs(*self*, *theGraphs*)

fastPlot

Module Contents

class PlotHolders

add_plot(*self*, *x*, *y*, ***kwargs*)

get_wgGraphs(*self*)

new_plot(*self*)

set_title(*self*, *theTitle*, ***kwargs*)

reset(*self*)

axis_equal(*self*)

class WindowHolders

set_currFigure(*self*, *currFigure*)

add_plot(*self*, **args*, ***kwargs*)

set_title(*self*, **args*, ***kwargs*)

new_figure(*self*)

new_plot(*self*)

show(*self*)

get_curr_plotHolder(*self*)

get_wgGraphs(*self*, *fig=None*)

get_all_figures(*self*)

axis_equal(*self*)

myWindows

plot(*x*, *y*, *hold=False*, ***kwargs*)
Plot new trace

show()
Show (start qt mainloop) graphs. Blocking

figure(*numb*)
Set current figure

new_plot()
Add new plot

set_title(*theTitle*, ***kwargs*)
Set title of the plot

axis_equal()

get_all_figures()
Get all existing figures

get_wgGraphs(*fig=None*)
Advanced option. :return: *widget_graphs_visual*

Package Contents

class gui_mainWindow(*QtWidgetList*, *isLight=True*, *actionOnWindowClosed=None*, *neverCloseWindow=False*, *title_window='Awesome Visualisation Tool'*, *size=None*)
Bases: PyQt5.QtWidgets.QMainWindow

Main class that spawns a Qt window. Use *run()* to display it.

set_actionOnClose(*self*, *actionOnWindowClosed*)

closeEvent(*self*, *event*)

run(*self*, *hold=False*)
Display the window

keyPressEvent(*self*, *event*)

app

start_qt_mainloop()
Starts qt mainloop, which is necessary for qt to handle events

stop_qt_mainloop()
Stops qt mainloop and resumes to program

class gui_collection_exporter
Bases: PyQt5.QtWidgets.QMainWindow

Simple gui that allows to export data

signal_has_exported

signal_has_reset

exportCollection(*self*)
Export the collection

reset(*self*)

add_data_to_collection(*self*, *data*)
Add data to the collection to export

Parameters **data** – Whichever type you like

set_info(*self*, *info*)

set_collection(*self*, *theCollection*)

class DataAnimationVisuals(*id=0*, *window_title='Animation'*)
Bases: PyQt5.QtWidgets.QMainWindow

Spawns a gui that includes button to create animations nicely when paired with *widget_graphs_visual*

SlIDER_MAXIMUM_VALUE = 500

SLIDER_MINIMUM_VALUE = 1

add_trace(*self*, *trace_id*, *element_list*, *theTrace*)
Add a trace to the animation.

Parameters

- **trace_id** – id of the trace
- **element_list** – List of elements to save: [[OpenGL_item1, text_item1], [OpenGL_item2, text_item2], ... [OpenGL_itemN, text_itemN]]
- **theTrace** – TraceVisual

Returns

add_elementToTrace(*self*, *trace_id*, *indexPoint*)

delete_point(*self*, *trace_id*, *thePoint*)

reset_all(*self*)

delete_all(*self*)

pause_play(*self*)

show_all(*self*)

next_frame(*self*)

slider_handler(*self*)

frame_selector(*self*)

set_refreshTime(*self*)

is_empty(*self*)

run(*self*)

closeEvent(*self*, *_*)

contains_trace(*self*, *trace_id*)

export_picture(*self*)

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update(*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs(*self*)
Export the graphs

link_axes(*self*)

get_graph(*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent(*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph(*self*, *idGraph*)
Delete the graph idGraph

delete(*self*)

get_all_graphsVisual(*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons(*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick(*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title(*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template(*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

class widget_line_drawer(*minWinHeight=300*, *minWinWidth=300*, *is_light=True*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget allowing to display several lines easily

signal_must_update

on_update_signal(*self*, *listOfLines*)

delete_lines(*self*, *key_id*)
Dele the lines :param key_id: id to delete :return:

set_lines(*self*, *listOfLines*, *key_id=0*, *pen=None*)
Set the lines to display :param listOfLines: list of [x1, y1, z1, x2, y2, z2] corresponding to lines :param key_id: id of the trace :param pen: pen used to draw the lines :return:

paintEvent(*self*, *event*, *painter=None*)

get_extrema_lines(*self*)

class widget_menuButton(*theParentButton*)
Bases: PyQt5.QtWidgets.QMenu

Same as QMenu, but integrates it behind a button more easily.

showEvent(*self*, *QShowEvent*)

class widget_openGL(*parent=None*)
Bases: PyQt5.QtWidgets.QOpenGLWidget

Interface that provides opengl capabilities. Ensures zoom, light, rotation, etc.

sizeHint(*self*)

minimumSizeHint(*self*)

set_deviceDrawer(*self*, *theDeviceDrawer*)
Set a drawer *optimeed.visualize.gui.widgets.openGLWidget.DeviceDrawerInterface.DeviceDrawerInterface*

set_deviceToDraw(*self*, *theDeviceToDraw*)
Set the device to draw optimeed.InterfaceDevice.InterfaceDevice

initializeGL(*self*)

paintGL(*self*)

resizeGL(*self*, *w*, *h*)

mousePressEvent(*self*, *event*)

mouseMoveEvent(*self*, *event*)

keyPressEvent(*self*, *event*)

wheelEvent(*self*, *QWheelEvent*)

class widget_text(*theText*, *is_light=False*, *convertToHtml=False*)
Bases: PyQt5.QtWidgets.QLabel

Widget able to display a text

set_text(*self*, *theText*, *convertToHtml=False*)
Set the text to display

class guiPyqtgraph(*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList(*self*)
Refresh all the traces

class DeviceDrawerInterface

keyboard_push_action(*self*, *theKey*)

get_colour_scalebar(*self*)

get_colour_background(*self*)

get_opengl_options(*self*)

class on_graph_click_delete(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Delete the points from the graph, and save the modified collection

apply(*self*)

reset(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_export(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: export the selected points

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

reset_graph(*self*)

get_name(*self*)

class on_click_extract_pareto(*theDataLink*, *max_x=False*, *max_y=False*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: extract the pareto from the cloud of points

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, _)

get_name(*self*)

class on_graph_click_showInfo(*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual(*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class Repr_opengl(*DeviceDrawer*)

get_widget(*self*, *theNewDevice*)

class Repr_lines(*attribute_lines*)

get_widget(*self*, *theNewDevice*)

class on_graph_click_remove_trace(*theDataLink*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *_*)

get_name(*self*)

class on_click_copy_something(*theDataLink*, *functionStrFromDevice*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: copy something

graph_clicked(*self*, *the_graph_visual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_click_change_symbol(*theLinkDataGraph*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On Click: Change the symbol of the point that is clicked

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class on_graph_click_interface
Interface class for the action to perform when a point is clicked

class DataAnimationOpenGL(*theOpenGLWidget*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show opengl drawing

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

class DataAnimationOpenGLwText(**args*, *is_light=True*, ***kwargs*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationOpenGL*

Implements *DataAnimationVisuals* to show opengl drawing and text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationLines(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.gui_data_animation.DataAnimationVisuals*

Implements *DataAnimationVisuals* to show drawing made out of lines (*widget_line_drawer*)

export_widget(*self*, *painter*)

delete_key_widgets(*self*, *key*)

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

get_interesting_elements(*self*, *devices_list*)

class DataAnimationVisualswText(*is_light=True*, *theId=0*, *window_title='Animation'*)
Bases: *optimeed.visualize.gui.widgets.graphsVisualWidget.examplesActionOnClick.on_click_anim.DataAnimationLines*

Same as *DataAnimationLines* but also with text

update_widget_w_animation(*self*, *key*, *index*, *the_data_animation*)

class on_graph_click_showAnim(*theLinkDataGraph*, *theAnimation*)

Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: add or remove an element to animate

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)

get_name(*self*)

class LinkDataGraph

class _collection_linker

add_link(*self*, *idSlave*, *idMaster*)

get_collection_master(*self*, *idToGet*)

is_slave(*self*, *idToCheck*)

set_same_master(*self*, *idExistingSlave*, *idOtherSlave*)

Parameters

- **idExistingSlave** – id collection of the existing slave
- **idOtherSlave** – id collection of the new slave that has to be linked to an existing master

add_collection(*self*, *theCollection*, *kwargs=None*)

add_graph(*self*, *howToPlotGraph*)

createGraphs(*self*)

get_howToPlotGraph(*self*, *idGraph*)

get_collectionInfo(*self*, *idCollectionInfo*)

create_trace(*self*, *collectionInfo*, *howToPlotGraph*, *idGraph*)

get_all_id_graphs(*self*)

get_all_traces_id_graph(*self*, *idGraph*)

update_graphs(*self*)

is_slave(*self*, *idGraph*, *idTrace*)

get_idCollection_from_graph(*self*, *idGraph*, *idTrace*, *getMaster=True*)

From indices in the graph, get index of corresponding collection

get_collection_from_graph(*self*, *idGraph*, *idTrace*, *getMaster=True*)

From indices in the graph, get corresponding collection

get_dataObject_from_graph(*self*, *idGraph*, *idTrace*, *idPoint*)

get_dataObjects_from_graph(*self*, *idGraph*, *idTrace*, *idPoint_list*)

remove_element_from_graph(*self*, *idGraph*, *idTrace*, *idPoint*, *deleteFromMaster=False*)

Remove element from the graph, or the master collection

remove_elements_from_trace(*self*, *idGraph*, *idTrace*, *idPoints*, *deleteFromMaster=False*)

Performances optimisation when compared to *LinkDataGraph.remove_element_from_graph()*

link_collection_to_graph_collection(*self*, *id_collection_graph*, *id_collection_master*)

Link data :param id_collection_graph: :param id_collection_master: :return:

remove_trace(*self*, *idGraph*, *idTrace*)

get_graph_and_trace_from_collection(*self*, *idCollection*)
Reverse search: from a collection, get the associated graph

get_mappingData_graph(*self*, *idGraph*)

get_mappingData_trace(*self*, *idGraph*, *idTrace*)

class HowToPlotGraph(*attribute_x*, *attribute_y*, *kwargs_graph=None*, *excluded=None*)

exclude_col(*self*, *id_col*)
Add id_col to exclude from the graph

__str__(*self*)

class gui_mainWindow(*QtWidgetList*, *isLight=True*, *actionOnWindowClosed=None*, *neverCloseWindow=False*, *title_window='Awesome Visualisation Tool'*, *size=None*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Main class that spawns a Qt window. Use *run()* to display it.

set_actionOnClose(*self*, *actionOnWindowClosed*)

closeEvent(*self*, *event*)

run(*self*, *hold=False*)
Display the window

keyPressEvent(*self*, *event*)

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update (*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs (*self*)
Export the graphs

link_axes (*self*)

get_graph (*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent (*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph (*self*, *idGraph*)
Delete the graph idGraph

delete (*self*)

get_all_graphsVisual (*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons (*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick (*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title (*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template (*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

class on_graph_click_showInfo (*theLinkDataGraph*, *visuals=None*)
Bases: *optimeed.visualize.gui.widgets.widget_graphs_visual.on_graph_click_interface*

On click: show informations about the points (loop through attributes)

class DataInformationVisuals

delete_visual (*self*, *theVisual*)

add_visual(*self*, *theVisual*, *theTrace*, *indexPoint*)

get_new_index(*self*)

curr_index(*self*)

graph_clicked(*self*, *theGraphVisual*, *index_graph*, *index_trace*, *indices_points*)
Action to perform when a point in the graph has been clicked: Creates new window displaying the device and its informations

get_name(*self*)

class guiPyqtgraph(*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList(*self*)
Refresh all the traces

class OptimizationDisplayer(*thePipeOpti*, *listOfObjectives*, *theOptimizer*, *additionalWidgets=None*)
Class used to display optimization process in real time

signal_optimization_over

set_actionsOnClick(*self*, *theList*)
Set actions to perform on click, list of *on_graph_click_interface*

generate_optimizationGraphs(*self*, *refresh_time=0.1*)
Generates the optimization graphs. :return: *Graphs*, *LinkDataGraph*, :class:'~optimeed.visulaize.gui.widgets.widget_graphs_visual.widget_graphs_visual

create_main_window(*self*)
From the widgets and the actions on click, spawn a window and put a gui around widgetsGraphsVisual.

__change_appearance_violate_constraints(*self*)

__auto_refresh(*self*, *refresh_time*)

__set_graphs_disposition(*self*)
Set nicely the graphs disposition

launch_optimization(*self*)
Perform the optimization and spawn the convergence graphs afterwards.

__callback_optimization(*self*, *myWindow*)

class Worker
Bases: `PyQt5.QtCore.QObject`

signal_show_UI

display_graphs(*self*, *theGraphs*)

class widget_graphs_visual(*theGraphs*, ***kwargs*)
Bases: `PyQt5.QtWidgets.QWidget`

Widget element to draw a graph. The traces and graphs to draw are defined in `Graphs` taken as argument. This widget is linked to the excellent third-party library pyqtgraph, under MIT license

signal_must_update

signal_graph_changed

set_graph_disposition(*self*, *indexGraph*, *row=1*, *col=1*, *rowspan=1*, *colspan=1*)
Change the graphs disposition.

Parameters

- **indexGraph** – index of the graph to change
- **row** – row where to place the graph
- **col** – column where to place the graph
- **rowspan** – number of rows across which the graph spans
- **colspan** – number of columns across which the graph spans

Returns

__create_graph(*self*, *idGraph*)

__check_graphs(*self*)

on_click(*self*, *plotDataItem*, *clicked_points*)

update_graphs(*self*, *singleUpdate=True*)
This method is used to update the graph. This is fast but NOT safe (especially when working with threads). To limit the risks, please use self.signal_must_update.emit() instead.

Parameters **singleUpdate** – if set to False, the graph will periodically refres each self.refreshtime

fast_update(*self*)
Use this method to update the graph in a fast way. NOT THREAD SAFE.

exportGraphs(*self*)
Export the graphs

link_axes(*self*)

get_graph(*self*, *idGraph*)
Get corresponding `GraphVisual` of the graph idGraph

keyPressEvent(*self*, *event*)
What happens if a key is pressed. R: reset the axes to their default value

delete_graph(*self*, *idGraph*)
Delete the graph idGraph

delete(*self*)

get_all_graphsVisual(*self*)
Return a dictionary {idGraph: `GraphVisual`}.

get_layout_buttons(*self*)
Get the QGraphicsLayout where it's possible to add buttons, etc.

set_actionOnClick(*self*, *theActionOnClick*)
Action to perform when the graph is clicked

Parameters **theActionOnClick** – *on_graph_click_interface*

Returns

set_title(*self*, *idGraph*, *titleName*, ***kwargs*)
Set title of the graph

Parameters

- **idGraph** – id of the graph
- **titleName** – title to set

set_article_template(*self*, *graph_size_x=8.8*, *graph_size_y=4.4*, *legendPosition='NW'*)
Method to set the graphs to article quality graph.

Parameters

- **graph_size_x** – width of the graph in cm
- **graph_size_y** – height of the graph in cm
- **legendPosition** – position of the legend (NE, SE, SW, NW)

Returns

class gui_mainWindow(*QtWidgetList*, *isLight=True*, *actionOnWindowClosed=None*, *neverCloseWindow=False*, *title_window='Awesome Visualisation Tool'*, *size=None*)
Bases: `PyQt5.QtWidgets.QMainWindow`

Main class that spawns a Qt window. Use *run()* to display it.

set_actionOnClose(*self*, *actionOnWindowClosed*)

closeEvent(*self*, *event*)

run(*self*, *hold=False*)
Display the window

keyPressEvent(*self*, *event*)

start_qt_mainloop()
Starts qt mainloop, which is necessary for qt to handle events

stop_qt_mainloop()
Stops qt mainloop and resumes to program

class Data(*x: list*, *y: list*, *x_label=''*, *y_label=''*, *legend=''*, *is_scattered=False*, *transfo_x=lambda selfData*, *x: x*, *transfo_y=lambda selfData*, *y: y*, *xlim=None*, *ylim=None*, *permutations=None*, *sort_output=False*, *color=None*, *symbol='o'*, *symbolsize=8*, *fillsymbol=True*, *outlinesymbol=1.8*, *linestyle='-'*, *width=2*)
This class is used to store informations necessary to plot a 2D graph. It has to be combined with a gui to be useful (ex. pyqtgraph)

set_data(*self*, *x: list*, *y: list*)
Overwrites current datapoints with new set

get_x(*self*)
Get x coordinates of datapoints

get_symbolsize(*self*)
Get size of the symbols

symbol_isfilled(*self*)
Check if symbols has to be filled or not

get_symbolOutline(*self*)
Get color factor of outline of symbols

get_length_data(*self*)
Get number of points

get_xlim(*self*)
Get x limits of viewbox

get_ylim(*self*)
Get y limits of viewbox

get_y(*self*)
Get y coordinates of datapoints

get_color(*self*)
Get color of the line

get_width(*self*)
Get width of the line

get_number_of_points(*self*)
Get number of points

get_plot_data(*self*)
Call this method to get the x and y coordinates of the points that have to be displayed. => After transformation, and after permutations.

Returns x (list), y (list)

get_permutations(*self*)
Return the transformation 'permutation': xplot[i] = xdata[permutation[i]]

get_invert_permutations(*self*)
Return the inverse of permutations: xdata[i] = xplot[revert[i]]

get_dataIndex_from_graphIndex(*self*, *index_graph_point*)
From an index given in graph, recovers the index of the data.

Parameters **index_graph_point** – Index in the graph

Returns index of the data

get_dataIndices_from_graphIndices(*self*, *index_graph_point_list*)
Same as get_dataIndex_from_graphIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_graph_point_list** – List of Index in the graph

Returns List of index of the data

get_graphIndex_from_dataIndex(*self*, *index_data*)
From an index given in the data, recovers the index of the graph.

Parameters **index_data** – Index in the data

Returns index of the graph

get_graphIndices_from_dataIndices(*self*, *index_data_list*)
Same as get_graphIndex_from_dataIndex but with a list in entry. Can (?) improve performances for huge dataset.

Parameters **index_data_list** – List of Index in the data

Returns List of index of the graph

set_permutations(*self*, *permutations*)
Set permutations between datapoints of the trace

Parameters **permutations** – list of indices to plot (example: [0, 2, 1] means that the first point will be plotted, then the third, then the second one)

get_x_label(*self*)
Get x label of the trace

get_y_label(*self*)
Get y label of the trace

get_legend(*self*)
Get name of the trace

get_symbol(*self*)
Get symbol

add_point(*self*, *x*, *y*)
Add point(s) to trace (inputs can be list or numeral)

delete_point(*self*, *index_point*)
Delete a point from the datapoints

is_scattered(*self*)
Delete a point from the datapoints

set_indices_points_to_plot(*self*, *indices*)
Set indices points to plot

get_indices_points_to_plot(*self*)
Get indices points to plot

get_linestyle(*self*)
Get linestyle

__str__(*self*)

export_str(*self*)
Method to save the points constituting the trace

class Graphs
Contains several `Graph`

updateChildren(*self*)

add_trace_firstGraph(*self*, *data*, *updateChildren=True*)
Same as add_trace, but only if graphs has only one id :param data: :param updateChildren: :return:

add_trace(*self*, *idGraph*, *data*, *updateChildren=True*)
Add a trace to the graph

Parameters

- **idGraph** – id of the graph
- **data** – *Data*
- **updateChildren** – Automatically calls callback functions

Returns id of the created trace

remove_trace(*self*, *idGraph*, *idTrace*, *updateChildren=True*)
Remove the trace from the graph

Parameters

- **idGraph** – id of the graph
- **idTrace** – id of the trace to remove
- **updateChildren** – Automatically calls callback functions

get_first_graph(*self*)
Get id of the first graph

Returns id of the first graph

get_graph(*self*, *idGraph*)
Get graph object at idgraph

Parameters **idGraph** – id of the graph to get

Returns Graph

get_all_graphs_ids(*self*)
Get all ids of the graphs

Returns list of id graphs

get_all_graphs(*self*)
Get all graphs. Return dict {id: Graph}

add_graph(*self*, *updateChildren=True*)
Add a new graph

Returns id of the created graph

remove_graph(*self*, *idGraph*)
Delete a graph

Parameters **idGraph** – id of the graph to delete

add_update_method(*self*, *childObject*)
Add a callback each time a graph is modified.

Parameters **childObject** – method without arguments

export_str(*self*)
Export all the graphs in text

Returns str

merge(*self*, *otherGraphs*)

reset(*self*)

class guiPyqtgraph(*graphsVisual*, ***kwargs*)
Create a gui for pyqtgraph with trace selection options, export and action on clic choices

refreshTraceList(*self*)
Refresh all the traces

class PlotHolders

add_plot(*self*, *x*, *y*, ***kwargs*)

get_wgGraphs(*self*)

new_plot(*self*)

set_title(*self*, *theTitle*, ***kwargs*)

reset(*self*)

axis_equal(*self*)

class WindowHolders

set_currFigure(*self*, *currFigure*)

add_plot(*self*, **args*, ***kwargs*)

set_title(*self*, **args*, ***kwargs*)

new_figure(*self*)

new_plot(*self*)

show(*self*)

get_curr_plotHolder(*self*)

get_wgGraphs(*self*, *fig=None*)

get_all_figures(*self*)

axis_equal(*self*)

myWindows

plot(*x*, *y*, *hold=False*, ***kwargs*)
Plot new trace

show()
Show (start qt mainloop) graphs. Blocking

figure(*numb*)
Set current figure

new_plot()
Add new plot

set_title(*theTitle*, ***kwargs*)
Set title of the plot

axis_equal()

get_all_figures()
Get all existing figures

get_wgGraphs(*fig=None*)
Advanced option. :return: *widget_graphs_visual*

6.1.2 Package Contents

VERSION = 1.1.0

CHAPTER 7

Developer guide

7.1 Developer documentation

7.1.1 To regenerate API:

- uncomment line # 'autoapi.extension' in conf.py.
- run make html
- run hack.py script
- recomment line # 'autoapi.extension'
- run make html
- Eventually update project on https://readthedocs.org/projects/optimeed/

7.1.2 To updata packages on PyPi:

- Change version in setup.py and in optimeed/__init__.py
- Create new wheel file code::*python setup.py sdist bdist_wheel*
- Upload it on pypi code::*twine upload dist/**

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