

# API Documentation

API Documentation

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# 1 Package isySUR

Package containing all modules used to compute kmls from SURs and visualising them using the kivy gui.

## 1.1 Modules

- **gui**: Make gui into a package.  
(Section 2, p. 7)
  - **MapGUI**: Module containing the base classes for the GUI.  
(Section 3, p. 8)
  - **mapview**: ..  
(Section 4, p. 33)
    - \* **downloader** (Section 5, p. 56)
    - \* **geojson**: ..  
(Section 6, p. 57)
    - \* **mbtsource**: This provider is based on .mbfiles from MapBox.  
(Section 7, p. 59)
    - \* **source** (Section 8, p. 61)
    - \* **types** (Section 9, p. 63)
    - \* **utils** (Section 10, p. 65)
    - \* **view** (Section 11, p. 66)
  - **triangulation**: Simple triangulation class.  
(Section 12, p. 85)
- **isyUtils**: Module containing utility functions.  
(Section 13, p. 87)
- **kmlData**: Module containing the KMLObject and Placemark.  
(Section 14, p. 88)
- **osmAPI**: Module containing the osmAPI class, used to perform requests to the OpenStreetMap API and parse the returned xml data to osmData.  
(Section 15, p. 93)
- **osmData**: Module containing the osm-data classes OSM, Node, Way and Relation.  
(Section 16, p. 95)
- **program**: Module containing the KMLCalculator, the main class handling the calculation of kmls based on SUR files.  
(Section 17, p. 109)
- **sur**: Basic class to load and store space usage rules.  
(Section 18, p. 111)
- **surTypeManager**: Helper class that reads known sur types (indoor, outdoor, both) from a file and can be queried for a certain rule.  
(Section 19, p. 113)

## 1.2 Variables

| Name        | Description        |
|-------------|--------------------|
| --package-- | <b>Value:</b> None |

## 2 Package isySUR.gui

Make gui into a package.

### 2.1 Modules

- **MapGUI**: Module containing the base classes for the GUI.  
(Section 3, p. 8)
- **mapview**: ..  
(Section 4, p. 33)
  - **downloader** (Section 5, p. 56)
  - **geojson**: ..  
(Section 6, p. 57)
  - **mbtsource**: This provider is based on .mbfiles from MapBox.  
(Section 7, p. 59)
  - **source** (Section 8, p. 61)
  - **types** (Section 9, p. 63)
  - **utils** (Section 10, p. 65)
  - **view** (Section 11, p. 66)
- **triangulation**: Simple triangulation class.  
(Section 12, p. 85)

### 2.2 Variables

| Name                     | Description        |
|--------------------------|--------------------|
| <code>--package--</code> | <b>Value:</b> None |

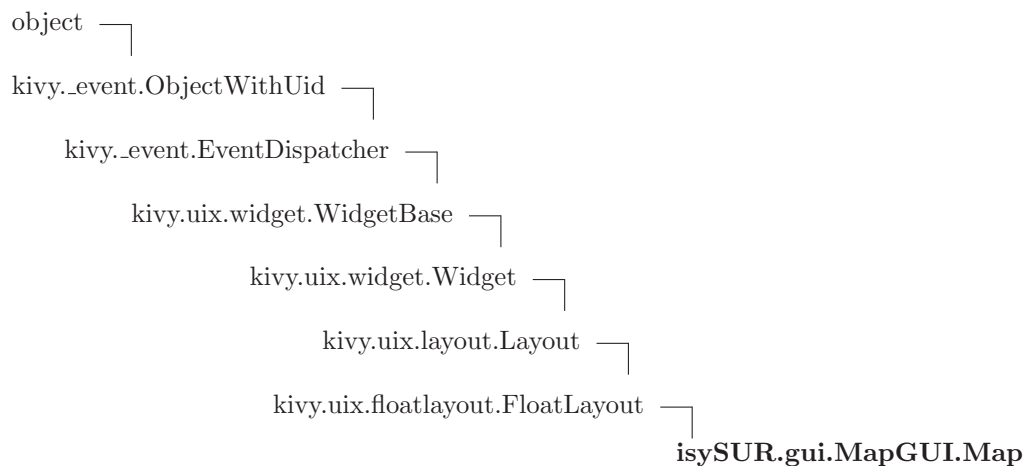
### 3 Module isySUR.gui.MapGUI

Module containing the base classes for the GUI.

#### 3.1 Variables

| Name                             | Description  |
|----------------------------------|--|
| <code>--package--</code>         | <b>Value:</b> 'isySUR.gui'   |
| <code>--warningregistry--</code> | <b>Value:</b> {'Not importing directory<br>'C:\\Python27\\lib\\kivy\\': m... |

#### 3.2 Class Map



##### 3.2.1 Methods

|   |
|---|
| <b><code>__init__(self, app)</code></b><br>Initializes the GUI.<br><b>Parameters</b><br><b>app:</b> Reference to the Application<br>( <i>type=kivy.app</i> )<br>Overrides: <code>object.__init__</code> |
| <b><code>setStop(self)</code></b><br>Indicator for stopping the SUR calculation Thread.   |
| <b><code>cleanUpCache(self)</code></b><br>Triggers function to delete cache folder.   |



---

**toast**(*self*, *text*, *long\_duration=False*)

---

Shows a toast.**Parameters**

**text:** The text, which should be displayed.  
(*type=**str*)

**long\_duration:** If paramter is True the toast is visible for a long time.  
Otherwise it has a shorter duration.  
(*type=**Boolean*)

---

**open\_menu**(*self*)

---

Opens and closes the Main Menu.

---

**open\_kmlList**(*self*)

---

Opens and closes the KML List.

---

**showPolygons**(*self*, *names*)

---

Shows all polygones represented by names.**Parameters**

**names:** Namelist of Polygons to be displayed on the GUI Map.  
(*type=**[str]*)

---

**hidePolygons**(*self*, *names*)

---

Hides all polygones represented by names.**Parameters**

**names:** Namelist of Polygons to be removed from the GUI Map.  
(*type=**[str]*)

**addPolygon**(*self*, *kmlObj*, *kmlName*, *first=True*)

Adds all Polygon from one KML Object to the Map.

**Parameters**

**kmlObj:** KML Data with Placemarks which will be displayed on the Map.

(*type=kmlData.KMLObject*)

**kmlName:** Name of the kmlObj.

(*type=str*)

**first:** Decides whether to jump to the first or last added Polygon. If there is only one Polygon in the KML Object and first is True, the Map moves to the Polygon. If first is False, the Map moves to the last added Polygon.

(*type=Boolean*)

**Return Value**

Returns whether the map already moved to a polygon and the name of the added Polygon to which the map moves if moved is False.

(*type=str,boolean*)

**computeAndShowKmls**(*self*, *path*, *queue*)

Calculates all KMLs from a loaded SUR file. The names of the KMLs are added to the KMLList to display all loaded KMLs. And each calculated Polygon of the Placemarks in the KMLs are added to the Map Layer to be displayed. When the calculation is finished, the Map moves to the last added Placemark.

**Parameters**

**path:** Path to the SUR file

(*type=str*)

**queue:** Queue in which all calculated KMLs are added (Thread Output)

(*type=Queue.Queue*)

**Inherited from *kivy.uix.floatlayout.FloatLayout***

add\_widget(), do\_layout(), remove\_widget()

**Inherited from *kivy.uix.widget.Widget***

\_\_eq\_\_(), \_\_hash\_\_(), clear\_widgets(), collide\_point(), collide\_widget(), get\_center\_x(), get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(), on\_opacity(), on\_touch\_down(), on\_touch\_move(), on\_touch\_up(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_local(), to\_parent(), to\_widget(), to\_window()

**Inherited from *kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

***Inherited from object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`,  
`__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

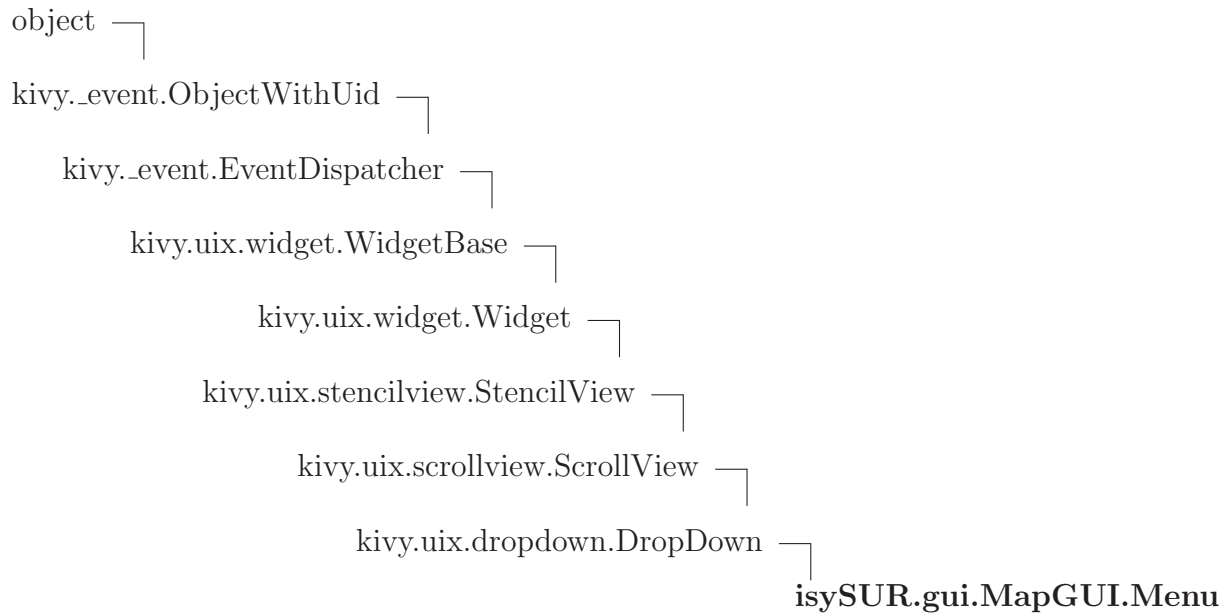
**3.2.2 Properties**

| Name   | Description |
|--|-------------|
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i>    |             |
| <code>__self__</code> , <code>proxy_ref</code>               |             |
| <i>Inherited from <code>kivy._event.ObjectWithUid</code></i> |             |
| <code>uid</code>   |             |
| <i>Inherited from object</i>                                 |             |
| <code>__class__</code>                                       |             |

**3.2.3 Class Variables**

| Name  | Description                                 |
|---|---|
| <code>text</code>   | <b>Value:</b> <code>StringProperty()</code> |
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i>   |   |
| <code>__events__</code> , <code>canvas</code> , <code>center</code> , <code>center_x</code> , <code>center_y</code> , <code>children</code> , <code>cls</code> , <code>disabled</code> , <code>height</code> ,<br><code>id</code> , <code>ids</code> , <code>opacity</code> , <code>parent</code> , <code>pos</code> , <code>pos_hint</code> , <code>right</code> , <code>size</code> , <code>size_hint</code> , <code>size_hint_x</code> ,<br><code>size_hint_y</code> , <code>top</code> , <code>width</code> , <code>x</code> , <code>y</code> |   |

### 3.3 Class Menu



#### 3.3.1 Methods

**`__init__(self, mapview, app)`**

Initializes the main menu of the GUI.

**Parameters**

**mapview:** Reference to the main GUI widget.

(*type=kivy.floatlayout*)

**app:** Reference to the main application.

(*type=kivy.app*)

Overrides: `object.__init__`

**`dismiss_load(self)`**

Dismisses the load popup.

**`dismiss_save(self)`**

Dismisses the save popup.

**`dismiss_config(self)`**

Dismisses the config popup.

**show\_load**(*self*, *obj*)

Creates a load popup and displays it.

**Parameters**

**obj**: Reference to the button which was clicked to open the load popup.  
(*type=kivy.uix.button*)

**show\_save**(*self*, *isConfig=False*)

Creates a save popup and displays it.

**Parameters**

**obj**: Reference to the Button which was clicked to open the save popup.  
(*type=kivy.uix.button*)

**show\_config**(*self*)

Creates a config popup and displays it.

**load\_kml**(*self*, *path*, *filename*)

Loads a given kml file.

**Parameters**

**path**: Path to the selected files.  
(*type=str*)  
**filename**: Names of selected files.  
(*type=[Str]*)

**load\_sur**(*self*, *path*, *filename*)

Loads a given SUR file.

**Parameters**

**path**: Path to the selected files.  
(*type=str*)  
**filename**: Names of selected files.  
(*type=[Str]*)

**load\_cfg**(*self*, *path*, *filename*)

Loads a given config file.

**Parameters**

**path:** Path to the selected files.  
*(type=str)*

**filename:** Names of selected files.  
*(type=[Str])*

**saveConfig**(*self*, *path*, *filename*)

Saves the config to the given path and filename.

**Parameters**

**path:** Path to store location.  
*(type=str)*

**filename:** Name of the new file.  
*(type=str)*

**saveKML**(*self*, *path*, *filename*)

Saves selected KMLs. If the given path is a directory all selected KMLs are saved separately to the directory. Additionally a complete KML containing all KMLs is stored there too. When the store location is a file, all KMLs will be added to one complete KML and stored with the given filename.

**Parameters**

**path:** Path to store location.  
*(type=str)*

**filename:** Name of the new file.  
*(type=str)*

**switchMarkers**(*self*, *obj*)

Shows or unshows markers on SUR position.

**Parameters**

**obj:** Button which changes the marker behaviour.  
*(type=kivy.uix.button)*

**Inherited from *kivy.uix.dropdown.DropDown***

`add_widget()`, `clear_widgets()`, `dismiss()`, `on_container()`, `on_dismiss()`, `on_key_down()`, `on_select()`, `on_touch_down()`, `on_touch_up()`, `open()`, `remove_widget()`, `select()`

***Inherited from kivy.uix.scrollview.ScrollView***

on\_\_viewport(), on\_effect\_cls(), on\_effect\_x(), on\_effect\_y(), on\_touch\_move(), simulate\_touch\_down(), to\_local(), to\_parent(), update\_from\_scroll()

***Inherited from kivy.uix.widget.Widget***

\_\_eq\_\_(), \_\_hash\_\_(), collide\_point(), collide\_widget(), get\_center\_x(), get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(), on\_opacity(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_widget(), to\_window()

***Inherited from kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

***Inherited from object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

**3.3.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i><br>__self__, proxy_ref |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br>uid              |             |
| <i>Inherited from object</i><br>__class__                           |             |

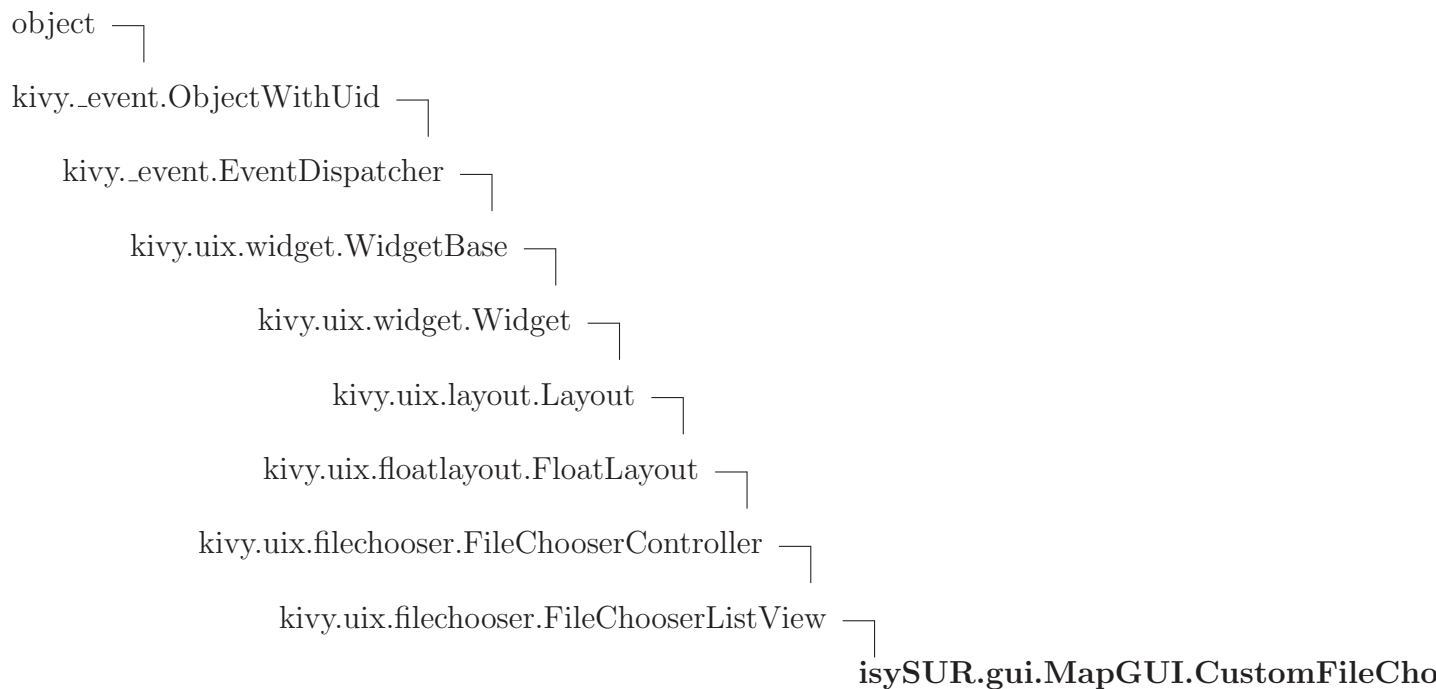
**3.3.3 Class Variables**

| Name  | Description                        |
|---|------------------------------------|
| loadfile  | <b>Value:</b> ObjectProperty(None) |
| savefile  | <b>Value:</b> ObjectProperty(None) |
| text_input  | <b>Value:</b> ObjectProperty(None) |
| <i>Inherited from kivy.uix.dropdown.DropDown</i><br>__events__, attach_to, auto_dismiss, auto_width, container, dismiss_on_select, max_height |                                    |
| <i>Inherited from kivy.uix.scrollview.ScrollView</i>  |                                    |

*continued on next page*

| Name | Description   |
|------|---|
|      | bar_alpha, bar_color, bar_margin, bar_pos, bar_pos_x, bar_pos_y, bar_width, do_scroll, do_scroll_x, do_scroll_y, effect_cls, effect_x, effect_y, hbar, scroll_distance, scroll_timeout, scroll_type, scroll_wheel_distance, scroll_x, scroll_y, vbar, viewport_size |
|      | <i>Inherited from kivy.uix.widget.Widget</i><br>canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y                                    |

### 3.4 Class CustomFileChooser



Implemented this and override the following method to fix path bug.



### 3.4.1 Methods

**open\_entry**(*self*, *entry*)

Builds the path to the selected item. If it's a directory the filechooser opens it.

**Parameters**

**entry:** Entry to open  
(*type=**str*)

Overrides: `kivy.uix.filechooser.FileChooserController.open_entry`

**Inherited from *kivy.uix.filechooser.FileChooserController***

`__init__()`, `cancel()`, `close_subselection()`, `entry_released()`, `entry_subselect()`, `entry_touched()`, `get_nice_size()`, `on_entries_cleared()`, `on_entry_added()`, `on_remove_subentry()`, `on_subentry_to_entry()`, `on_submit()`, `on_touch_down()`, `on_touch_up()`

**Inherited from *kivy.uix.floatlayout.FloatLayout***

`add_widget()`, `do_layout()`, `remove_widget()`

**Inherited from *kivy.uix.widget.Widget***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_move()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

**Inherited from *kivy.\_event.EventDispatcher***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

**Inherited from *object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

### 3.4.2 Properties

| Name  | Description |
|---|-------------|
| <i>Inherited from <i>kivy.uix.widget.Widget</i></i><br><code>__self__</code> , <code>proxy_ref</code> |             |
| <i>Inherited from <i>kivy._event.ObjectWithUid</i></i><br><code>uid</code>                            |             |
| <i>Inherited from <i>object</i></i>   |             |

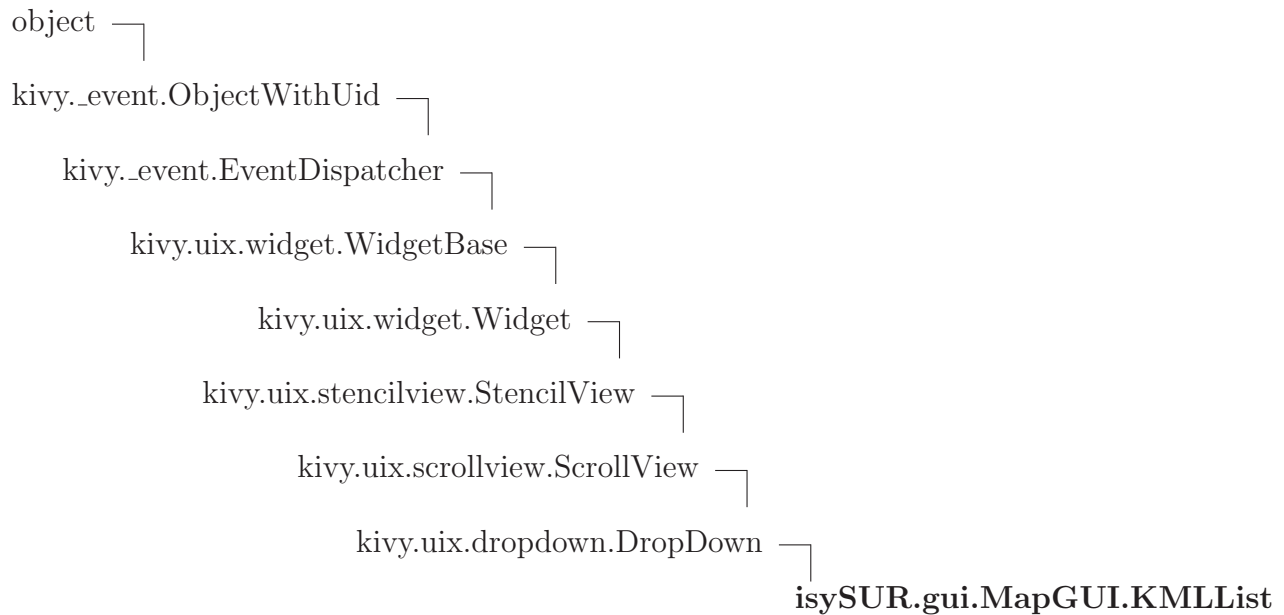
*continued on next page*

| Name      | Description |
|-----------|-------------|
| __class__ |             |

### 3.4.3 Class Variables

| Name   | Description |
|--|-------------|
| <i>Inherited from kivy.uix.filechooser.FileChooserController</i>   |             |
| __events__, dirselect, file_encodings, file_system, files, filter_dirs, filters, multiselect, path, progress_cls, rootpath, selection, show_hidden, sort_func                    |             |
| <i>Inherited from kivy.uix.widget.Widget</i>   |             |
| canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |             |

## 3.5 Class KMLList



### 3.5.1 Methods

**\_\_init\_\_**(*self*, *mapview*, *app*)

Initializes the KMLList menu, which displays all loaded KML files.

**Parameters**

**mapview**: Reference to the main GUI Widget

(*type=kivy.floatlayout*)

**app**: Reference to the main Application

(*type=kivy.app*)

Overrides: *object.\_\_init\_\_*

**createList**(*self*)

Creates the KML List.

**selectBut**(*self*, *obj*)

Hides or shows the selected KML on the Map.

**Parameters**

**obj**: Button which represents a loaded KML.

(*type=kivy.uix.button*)

**addItem**(*self*, *name*)

Adds an item to the KML List.

**Parameters**

**name**: Name of the new item.

(*type=str*)

**Inherited from *kivy.uix.dropdown.DropDown***

*add\_widget()*, *clear\_widgets()*, *dismiss()*, *on\_container()*, *on\_dismiss()*, *on\_key\_down()*, *on\_select()*, *on\_touch\_down()*, *on\_touch\_up()*, *open()*, *remove\_widget()*, *select()*

**Inherited from *kivy.uix.scrollview.ScrollView***

*on\_viewport()*, *on\_effect\_cls()*, *on\_effect\_x()*, *on\_effect\_y()*, *on\_touch\_move()*, *simulate\_touch\_down()*, *to\_local()*, *to\_parent()*, *update\_from\_scroll()*

**Inherited from *kivy.uix.widget.Widget***

*\_\_eq\_\_()*, *\_\_hash\_\_()*, *collide\_point()*, *collide\_widget()*, *get\_center\_x()*, *get\_center\_y()*, *get\_parent\_window()*, *get\_right()*, *get\_root\_window()*, *get\_top()*, *on\_disabled()*, *on\_opacity()*,

set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_widget(), to\_window()

### ***Inherited from kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(),  
getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(),  
unbind(), unregister\_event\_types()

### ***Inherited from object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(),  
\_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

## **3.5.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i><br>__self__, proxy_ref |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br>uid              |             |
| <i>Inherited from object</i><br>__class__                           |             |

## **3.5.3 Class Variables**

| Name   | Description |
|--|-------------|
| <i>Inherited from kivy.uix.dropdown.DropDown</i><br>__events__, attach_to, auto_dismiss, auto_width, container, dismiss_on_select,<br>max_height   |             |
| <i>Inherited from kivy.uix.scrollview.ScrollView</i><br>bar_alpha, bar_color, bar_margin, bar_pos, bar_pos_x, bar_pos_y, bar_width,<br>do_scroll, do_scroll_x, do_scroll_y, effect_cls, effect_x, effect_y, hbar,<br>scroll_distance, scroll_timeout, scroll_type, scroll_wheel_distance, scroll_x,<br>scroll_y, vbar, viewport_size |             |
| <i>Inherited from kivy.uix.widget.Widget</i><br>canvas, center, center_x, center_y, children, cls, disabled, height, id, ids,<br>opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y,<br>top, width, x, y   |             |

### 3.6 Class Toast



#### 3.6.1 Methods

**\_\_init\_\_(self, mapview)**

Initializes a new Toast.

**Parameters**

**mapview:** Reference to the main GUI Widget  
*(type=kivy.floatlayout)*

Overrides: `object.__init__`

**stayVisible(self, text)**

Displays the toast for an unkown duration.

**Parameters**

**text:** Text of the toast.  
*(type=str)*

**remove(self)**

Removes a toast after `stayVisible()` was called.

**show**(*self*, *text*, *length\_long*)

Displays a toast for the short or long duration.

**Parameters**

**text:** Text of the toast.

(*type=**str*)

**length\_long:** When length\_long is True, the toast is visible for a long duration, otherwise it is only visible for a short duration.

(*type=**Boolean*)

**Inherited from *kivy.uix.label.Label***

on\_ref\_press(), on\_touch\_down(), texture\_update()

**Inherited from *kivy.uix.widget.Widget***

\_\_eq\_\_(), \_\_hash\_\_(), add\_widget(), clear\_widgets(), collide\_point(), collide\_widget(), get\_center\_x(), get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(), on\_opacity(), on\_touch\_move(), on\_touch\_up(), remove\_widget(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_local(), to\_parent(), to\_widget(), to\_window()

**Inherited from *kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

**Inherited from *object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

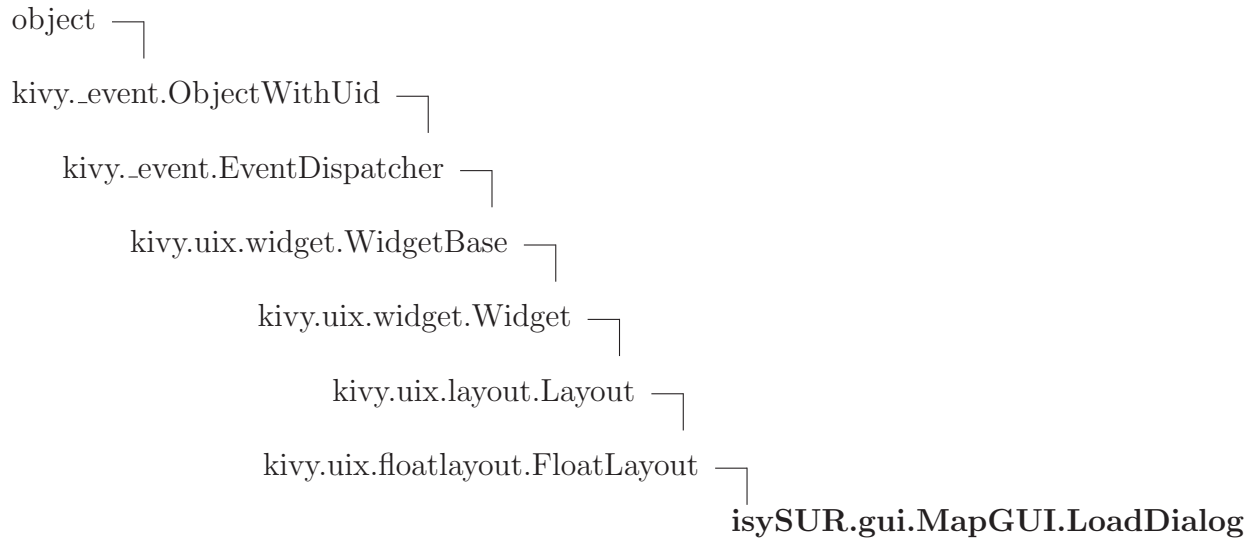
### 3.6.2 Properties

| Name   | Description |
|--|-------------|
| <i>Inherited from <i>kivy.uix.widget.Widget</i></i><br>__self__, proxy_ref |             |
| <i>Inherited from <i>kivy._event.ObjectWithUid</i></i><br>uid              |             |
| <i>Inherited from <i>object</i></i><br>__class__                           |             |

### 3.6.3 Class Variables

| Name   | Description  |
|--|--|
| <i>Inherited from kivy.uix.label.Label</i>   | anchors, bold, color, disabled_color, font_name, font_size, halign, italic, line_height, markup, max_lines, mipmap, padding, padding_x, padding_y, refs, shorten, text, text_size, texture, texture_size, valign |
| <i>Inherited from kivy.uix.widget.Widget</i> | __events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y                     |

### 3.7 Class LoadDialog



#### 3.7.1 Methods

##### *Inherited from kivy.uix.floatlayout.FloatLayout*

`__init__()`, `add_widget()`, `do_layout()`, `remove_widget()`

##### *Inherited from kivy.uix.widget.Widget*

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

##### *Inherited from kivy.\_event.EventDispatcher*

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

### ***Inherited from object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

### **3.7.2 Properties**

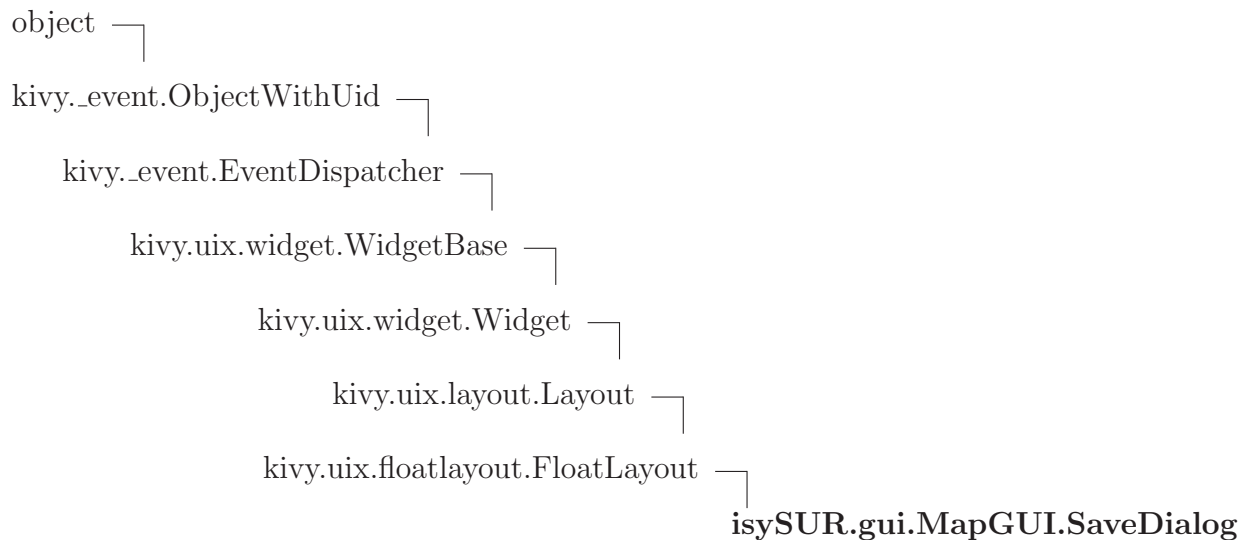
| Name   | Description |
|--|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i><br><code>__self__</code> , <code>proxy_ref</code> |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br><code>uid</code>                            |             |
| <i>Inherited from object</i><br><code>__class__</code>   |             |

### **3.7.3 Class Variables**

| Name  | Description                                     |
|---|---|
| <code>load</code>   | <b>Value:</b> <code>ObjectProperty(None)</code> |
| <code>cancel</code>   | <b>Value:</b> <code>ObjectProperty(None)</code> |
| <code>test</code>   | <b>Value:</b> <code>ObjectProperty(None)</code> |
| <i>Inherited from kivy.uix.widget.Widget</i><br><code>__events__</code> , <code>canvas</code> , <code>center</code> , <code>center_x</code> , <code>center_y</code> , <code>children</code> , <code>cls</code> , <code>disabled</code> , <code>height</code> , <code>id</code> , <code>ids</code> , <code>opacity</code> , <code>parent</code> , <code>pos</code> , <code>pos_hint</code> , <code>right</code> , <code>size</code> , <code>size_hint</code> , <code>size_hint_x</code> , <code>size_hint_y</code> , <code>top</code> , <code>width</code> , <code>x</code> , <code>y</code> |   |



### 3.8 Class SaveDialog



#### 3.8.1 Methods

##### *Inherited from kivy.uix.floatlayout.FloatLayout*

`__init__()`, `add_widget()`, `do_layout()`, `remove_widget()`

##### *Inherited from kivy.uix.widget.Widget*

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

##### *Inherited from kivy.\_event.EventDispatcher*

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

##### *Inherited from object*

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

#### 3.8.2 Properties

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i>    |             |
| __self__, proxy_ref                             |             |
| <i>Inherited from kivy._event.ObjectWithUid</i> |             |
| uid   |             |
| <i>Inherited from object</i>                    |             |
| __class__                                       |             |

### 3.8.3 Class Variables

| Name   | Description                        |
|--|------------------------------------|
| save   | <b>Value:</b> ObjectProperty(None) |
| text_input   | <b>Value:</b> ObjectProperty(None) |
| cancel   | <b>Value:</b> ObjectProperty(None) |
| <i>Inherited from kivy.uix.widget.Widget</i>   |                                    |
| __events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |                                    |

## 3.9 Class ConfigDialog



## 3.9.1 Methods

---

**\_\_init\_\_**(*self*, *app*, *save*, *load*, *cancel*)

---

 Initializes the config dialog.
**Parameters**

- app:** Reference to the main Application  
(*type=kivy.app*)
- save:** Reference to save function.  
(*type=kivy.uix.property.ObjectProperty*)
- load:** Reference to load function.  
(*type=kivy.uix.property.ObjectProperty*)
- cancel:** Reference to cancel function.  
(*type=kivy.uix.property.ObjectProperty*)

---

 Overrides: object.\_\_init\_\_

---

**addConfigContent**(*self*)

---

 Adds the loaded config to the Config Popup.

---

**addContentHeader**(*self*)

---

 Adds the ruleAreas to the Config Popup.

---

**addConfigEntry**(*self*, *ruleArea*, *rule*)

---

 Adds one config rule to the Config Popup.
**Parameters**

- ruleArea:** Field of application of the rule.  
(*type=str*)
- rule:** SUR Rule of this entry.  
(*type=str*)

---

**changeRuleArea**(*self*, \**args*)

---

 Changes the field of application of a rule.
**Parameters**

- args:** List of arguments from the kivy.uix.checkbox, when selecting the new rule area.  
(*type=[]*)

**action(self, obj)**

Changes the action of the Action Button in the Config Popup.

Possible actions:

- Create new rule
- Add new rule to config
- Delete selected rules

**Parameters**

obj: Actionbutton  
(type=kivy.uix.button)

**clearConfig(self)**

Clears the config popup.

**deleteEntry(self, \*args)**

Adds or removes rule from the deletion list.

**Parameters**

args: List of arguments from the Checkbox when clicked.  
(type=[])

**Inherited from kivy.uix.floatlayout.FloatLayout**

add\_widget(), do\_layout(), remove\_widget()

**Inherited from kivy.uix.widget.Widget**

\_\_eq\_\_(), \_\_hash\_\_(), clear\_widgets(), collide\_point(), collide\_widget(), get\_center\_x(), get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(), on\_opacity(), on\_touch\_down(), on\_touch\_move(), on\_touch\_up(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_local(), to\_parent(), to\_widget(), to\_window()

**Inherited from kivy.\_event.EventDispatcher**

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

**Inherited from object**

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

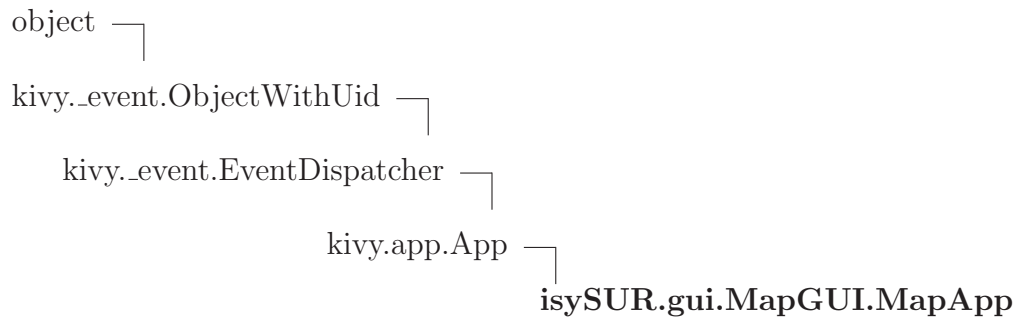
### 3.9.2 Properties

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i><br>__self__, proxy_ref |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br>uid              |             |
| <i>Inherited from object</i><br>__class__                           |             |

### 3.9.3 Class Variables

| Name   | Description |
|--|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i><br>__events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |             |

## 3.10 Class MapApp



### 3.10.1 Methods

|   |
|---|
| <b>__init__</b> (self, configPath='')   |
| Initializes main application class.   |
| <b>Parameters</b>   |
| <b>configPath</b> : Path to the config, when loaded on start up.<br>( <i>type=str</i> ) |
| Overrides: object.__init__  |

**on\_stop**(*self*)

Stops the SUR calculation if one is running and cleans up the cache when program is closed.

Overrides: kivy.app.App.on\_stop

**on\_start**(*self*)

Sets the icon and title of the program on start up.

Overrides: kivy.app.App.on\_start

**build**(*self*)

Initializes the application; will be called only once.  
If this method returns a widget (tree), it will be used as the root widget and added to the window.

:return: None or a root :class: '~kivy.uix.widget.Widget' instance  
if no self.root exists.

Overrides: kivy.app.App.build exitit(inherited documentation)

**loadConfig**(*self*, *configPath*)

Load the given config.

**Parameters**

**configPath:** Path to the config

(*type=*str)

**clearConfig**(*self*)

Empties the config.

**isConfigEmpty**(*self*)

Checks whether the config is empty.

**Return Value**

Return True, when config is empty, otherwise False.

(*type=*boolean)

**addKML**(*self*, *kmlObj*)

Adds a KML to the application. and returns the stored name of the kmlObj.

**Parameters**

**kmlObj**: KML data to be added.  
(*type=kmlData.KMLObject*)

**Return Value**

Name of the kmlObj under which it is stored.  
(*type=str*)

**getPolygonFromPlacemark**(*self*, *placemark*)

Returns the Polygon of a Placemark.

**Parameters**

**placemark**: Placemark from which the polygon is returned.  
(*type=kmlData.Placemark*)

**Return Value**

List of Polygon coords  
(*type=[Tupel(float,float),..]*)

**getSelectedPolygons**(*self*)

Get all active KMLObjects of the application.

**Return Value**

Returns a list of selected KMLObjects.  
(*type=[kmlData.KMLObject]*)

**Inherited from *kivy.app.App***

build\_config(), build\_settings(), close\_settings(), create\_settings(), destroy\_settings(), display\_settings(), get\_application\_config(), get\_application\_icon(), get\_application\_name(), get\_running\_app(), load\_config(), load\_kv(), on\_config\_change(), on\_icon(), on\_pause(), on\_resume(), on\_title(), open\_settings(), run(), stop()

**Inherited from *kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

**Inherited from *object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_hash\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(),

`__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

### 3.10.2 Properties

| Name  | Description                    |
|---|--------------------------------|
| <i>Inherited from kivy.app.App</i>              | directory, name, user_data_dir |
| <i>Inherited from kivy._event.ObjectWithUid</i> | uid                            |
| <i>Inherited from object</i>                    | <code>__class__</code>         |

### 3.10.3 Class Variables

| Name                               | Description   |
|------------------------------------|---|
| <i>Inherited from kivy.app.App</i> | <code>__events__</code> , icon, kv_directory, kv_file, settings_cls, title, use_kivy_settings |



## 4 Package isySUR.gui.mapview

(section) MapView

.. author:: Mathieu Virbel <mat@kivy.org>

MapView is a Kivy widget that display maps.

**Version:** 0.2

### 4.1 Modules

- **downloader** (*Section 5, p. 56*)
- **geojson**: ..  
(*Section 6, p. 57*)
- **mbtsource**: This provider is based on .mbfiles from MapBox.  
(*Section 7, p. 59*)
- **source** (*Section 8, p. 61*)
- **types** (*Section 9, p. 63*)
- **utils** (*Section 10, p. 65*)
- **view** (*Section 11, p. 66*)

### 4.2 Class Coordinate



Coordinate(lat, lon)

#### 4.2.1 Methods

|                                       |
|---------------------------------------|
| <b>__getnewargs__</b> ( <i>self</i> ) |
|---------------------------------------|

|  |
|--|
| Return self as a plain tuple. Used by copy and pickle. |
|--|

|                                 |
|---------------------------------|
| Overrides: tuple.__getnewargs__ |
|---------------------------------|

|                                     |
|-------------------------------------|
| <b>__getstate__</b> ( <i>self</i> ) |
|-------------------------------------|

|                                       |
|---------------------------------------|
| Exclude the OrderedDict from pickling |
|---------------------------------------|

```
--new--(_cls, lat, lon)
```

Create new instance of Coordinate(lat, lon)

**Return Value**

a new object with type S, a subtype of T

Overrides: object.\_\_new\_\_

```
--repr--(self)
```

Return a nicely formatted representation string

Overrides: object.\_\_repr\_\_

**Inherited from tuple**

```
--add--(), --contains--(), --eq--(), --ge--(), --getattribute--(), --getitem--(), --getslice--(),
--gt--(), --hash--(), --iter--(), --le--(), --len--(), --lt--(), --mul--(), --ne--(), --rmul--(),
--sizeof--(), count(), index()
```

**Inherited from object**

```
--delattr--(), --format--(), --init--(), --reduce--(), --reduce_ex--(), --setattr--(), --str--(),
--subclasshook--()
```

#### 4.2.2 Properties

| Name                         | Description              |
|------------------------------|--------------------------|
| lat                          | Alias for field number 0 |
| lon                          | Alias for field number 1 |
| <i>Inherited from object</i> |                          |
| __class__                    |                          |

### 4.3 Class Bbox



#### 4.3.1 Methods

```
collide(self, *args)
```

***Inherited from tuple***

```
__add__(), __contains__(), __eq__(), __ge__(), __getattr__(), __getitem__(), __getnewargs__(),
__getslice__(), __gt__(), __hash__(), __iter__(), __le__(), __len__(), __lt__(), __mul__(),
__ne__(), __new__(), __repr__(), __rmul__(), __sizeof__(), count(), index()
```

***Inherited from object***

```
__delattr__(), __format__(), __init__(), __reduce__(), __reduce_ex__(), __setattr__(), __str__(),
__subclasshook__()
```

**4.3.2 Properties**

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| <code>__class__</code>       |             |

**4.4 Class MapSource**

```
object └─ mapview.source.MapSource
```

**Known Subclasses:** isySUR.gui.mapview.mbtsource.MBTilesMapSource

Base class for implementing a map source / provider

**4.4.1 Methods**

```
__init__(self,
url='http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png',
cache_key=None, min_zoom=0, max_zoom=19, tile_size=256,
image_ext='png', attribution='\xc2\xa9 OpenStreetMap contributors',
subdomains='abc')
```

`x.__init__(...)` initializes `x`; see `help(type(x))` for signature

Overrides: `object.__init__` extit(inherited documentation)

```
fill_tile(self, tile)
```

Add this tile to load within the downloader

```
from_provider(key)
```

|   |
|---|
| <b>get_col_count</b> ( <i>self</i> , <i>zoom</i> )  |
| Get the number of tiles in a col at this zoom level   |
| <b>get_lat</b> ( <i>self</i> , <i>zoom</i> , <i>y</i> )   |
| Get the latitude to the y position in the map source's projection                                   |
| <b>get_lon</b> ( <i>self</i> , <i>zoom</i> , <i>x</i> )   |
| Get the longitude to the x position in the map source's projection                                  |
| <b>get_max_zoom</b> ( <i>self</i> )   |
| Return the maximum zoom of this source  |
| <b>get_min_zoom</b> ( <i>self</i> )   |
| Return the minimum zoom of this source  |
| <b>get_row_count</b> ( <i>self</i> , <i>zoom</i> )  |
| Get the number of tiles in a row at this zoom level   |
| <b>get_x</b> ( <i>self</i> , <i>zoom</i> , <i>lon</i> )   |
| Get the x position on the map using this map source's projection (0, 0) is located at the top left. |
| <b>get_y</b> ( <i>self</i> , <i>zoom</i> , <i>lat</i> )   |
| Get the y position on the map using this map source's projection (0, 0) is located at the top left. |

### ***Inherited from object***

`__delattr__()`, `__format__()`, `__getattribute__()`, `__hash__()`, `__new__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

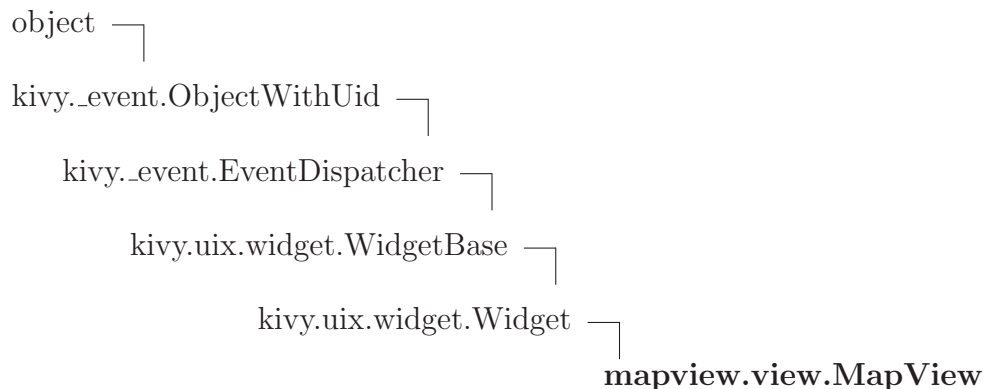
#### **4.4.2 Properties**

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| <code>__class__</code>       |             |

#### **4.4.3 Class Variables**

| Name      | Description  |
|-----------|--|
| providers | <b>Value:</b> {'cyclemap': (0, 0, 17, 'http://{s}.tile.opencyclemap.org... |

## 4.5 Class MapView



MapView is the widget that control the map displaying, navigation, and layers management.

### 4.5.1 Methods

**\_\_init\_\_**(*self*, *\*\*kwargs*)

*x.\_\_init\_\_*(...) initializes *x*; see `help(type(x))` for signature

Overrides: `object.__init__` `extit`(inherited documentation)

**addPolygon**(*self*, *name*, *polygon*, *color*, *markerCoords*)

Adds and draws a new polygon onto the map.

#### Parameters

**name:** Name of the polygon to be added.  
(*type*=*str*)

**polygon:** List of vertices of the polygon.  
(*type*=[(*float*, *float*)])

**color:** Style value of KML  
(*type*=*dict*)

**markerCoords:** Coordinates of the SUR.  
(*type*=*Tuple(float, float)*)

---

**add\_layer**(*self*, *layer*, *mode*='window')

Add a new layer to update at the same time the base tile layer. *mode* can be either "scatter" or "window". If "scatter", it means the layer will be within the scatter transformation. It's perfect if you want to display path / shape, but not for text. If "window", it will have no transformation. You need to position the widget yourself: think as Z-sprite / billboard. Defaults to "window".

**Parameters**

**layer:** The layer for updating.

(*type*=*kivy.uix.widget.Widget*)

**mode:** (Optional) The mode for updating could be "scatter" or "window".

(*type*=*str*)

---

**add\_marker**(*self*, *marker*, *layer*=None)

Add a marker onto the layer. If *layer* is None, it will be added in the default marker layer. If there is no default marker layer, a new one will be automatically created.

**Parameters**

**marker:** The marker to be added.

(*type*=*view.MapMarker*)

**layer:** (Optional) the layer the marker should be added to.

(*type*=*view.MarkerMapLayer*)

**add\_widget**(*self*, *widget*)

Add a new widget as a child of this widget.

:Parameters:

    ‘widget’: :class:‘Widget’  
        Widget to add to our list of children.  
    ‘index’: int, defaults to 0  
        \*(this attribute was added in 1.0.5)\*  
        Index to insert the widget in the list

```
>>> from kivy.uix.button import Button
>>> from kivy.uix.slider import Slider
>>> root = Widget()
>>> root.add_widget(Button())
>>> slider = Slider()
>>> root.add_widget(slider)
```

Overrides: kivy.uix.widget.Widget.add\_widget [exitit](#)(inherited documentation)

**animated\_diff\_scale\_at**(*self*, *d*, *x*, *y*)

**bbox\_for\_zoom**(*self*, *vx*, *vy*, *w*, *h*, *zoom*)

**center\_on**(*self*, \**args*)

Center the map on the coordinate :class:‘Coordinate’, or a (lat, lon.

**cleanUpCache**(*self*)

**convertKMLColor**(*self*, *kmlColor*)

Convert a KML Color to its rgba value between 0 and 1.

**Parameters**

    kmlColor: Color to be converted.  
                (*type=*str)

**Return Value**

    Returns the rgba values of kmlColor.

**diff\_scale\_at**(*self*, *d*, *x*, *y*)

**do\_update**(*self*, *dt*)

**drawPolygon(*self*)**

Draws a Polygon onto the Map.

**getBBoxOfPolygon(*self*, *polygon*)**

This function calculates a boundingbox in respect to the given polygon.

**Parameters**

**polygon:** The polygon for which the bbox should be computed, e.g.  
 [(1.0,2.0),(2.0,1.0),(1.0,1.0),(1.0,2.0)].

**Return Value**

The calculated bbox, e.g. [minLat,minLon, maxLat,maxLon].  
*(type=[float,float,float,float])*

**get\_bbox(*self*, *margin*=0)**

Returns the bounding box from the bottom/left (lat1, lon1) to top/right (lat2, lon2).

**Parameters**

**margin:** (Optional) addition margin for the boundingbox.

**Return Value**

The boundingbox. @rtype mapview.Bbox

**get\_latlon\_at(*self*, *x*, *y*, *zoom*=None)**

Return the current :class:‘Coordinate‘ within the (x, y) widget coordinate.

**Parameters**

**x:** The x-coordinate of the point.  
*(type=float)*  
**y:** The y-coordinate of the point.  
*(type=float)*

**Return Value**

The current Coordinate within the (x,y) widget coordinate.  
*(type=mapview.Coordinate)*

**get\_window\_xy\_from(*self*, *lat*, *lon*, *zoom*)**

Returns the x/y position in the widget absolute coordinates from a lat/lon.

**Return Value**

The x/y position in the widget.  
*(type=float,float)*



**hideMarkers**(*self*)

Hides all markers on the Marker Layer.

**hidePolygon**(*self, name*)

Removes a polygon from the Map.

**Parameters**

**name:** Name of the polygon to be removed.

(*type=*str)

**isPolyInView**(*self, name*)

This function proves if a polygon is in the current viewspace.

**Parameters**

**name:** The name of the polygon.

(*type=*str)

**Return Value**

True if in viewspace otherwise False.

(*type=*boolean)

**isPolyVisible**(*self, name*)

This function proves if a polygon is completely visible in viewspace.

**Parameters**

**name:** The name of the polygon.

(*type=*str)

**Return Value**

True if completely in viewspace otherwise False.

(*type=*boolean)

**load\_tile**(*self, x, y, size, zoom*)

**load\_tile\_for\_source**(*self, map\_source, opacity, size, x, y, zoom*)

**load\_visible\_tiles**(*self*)

**move\_tiles\_to\_background**(*self*)

**on\_map\_relocated**(*self, zoom, coord*)

**on\_map\_source**(*self*, *instance*, *source*)

**on\_pos**(*self*, *instance*, *pos*)

**on\_size**(*self*, *instance*, *size*)

**on\_touch\_down**(*self*, *touch*)

Receive a touch down event.

:Parameters:

‘touch’: :class:‘~kivy.input.motionEvent’ class  
Touch received. The touch is in parent coordinates. See  
:mod:‘~kivy.uix.relativelayout’ for a discussion on  
coordinate systems.

:Returns:

bool. If True, the dispatching of the touch event will stop.

Overrides: kivy.uix.widget.Widget.on\_touch\_down extit(inherited documentation)

**on\_transform**(*self*, \**args*)

**on\_zoom**(*self*, *instance*, *zoom*)

on\_zoom Event handler

**remove\_all\_tiles**(*self*)

**remove\_layer**(*self*, *layer*)

Remove the layer.

**Parameters**

**layer**: The layer to be removed. @type kivy.uix.widget.Widget

**remove\_marker**(*self*, *marker*)

Remove a marker from its layer.

---

**remove\_widget**(*self*, *widget*)

Remove a widget from the children of this widget.

**:Parameters:**

    ‘widget’: :class:‘Widget‘

        Widget to remove from our children list.

```
>>> from kivy.uix.button import Button
```

```
>>> root = Widget()
```

```
>>> button = Button()
```

```
>>> root.add_widget(button)
```

```
>>> root.remove_widget(button)
```

Overrides: kivy.uix.widget.Widget.remove\_widget extit(inherited documentation)

---

**scale\_at**(*self*, *scale*, *x*, *y*)

---

**set\_zoom\_at**(*self*, *zoom*, *x*, *y*, *scale=None*)

Sets the zoom level, leaving the (x, y) at the exact same point in the view.

**Parameters**

**zoom:**   tThe zoom level.

**type:**   int

**x:**       The x-coordinate of the point.

              (*type=float*)

**y:**       The y-coordinate of the point.

              (*type=float*)

**scale:** (Optinal) the scalefaktor for the scatter.

              (*type=int*)

---

**showMarkers**(*self*)

Shows all markers.

---

**showPolygon**(*self*, *name*)

Makes a polygon visible on the Map.

**Parameters**

**name:** Name of the polygon to be shown.

              (*type=str*)

**sync\_to**(*self*, *other*)

Reflect the lat/lon/zoom of the other MapView to the current one.

**tile\_in\_tile\_map**(*self*, *tile\_x*, *tile\_y*)

**tile\_map\_set**(*self*, *tile\_x*, *tile\_y*, *value*)

**trigger\_update**(*self*, *full*)

**unload**(*self*)

Unload the view and all the layers. It also cancel all the remaining downloads.

**zoom\_to**(*self*, *lat*, *lon*, *zoom*)

Zooms to the given zoom level at the given position.

**Parameters**

**lat**: Lat-coordinate of the given position.

(*type=float*)

**lon**: Lon-coordinate of the given position.

(*type=float*)

**zoom**: Zoom-factor.

(*type=int*)

**zoom\_to\_Polygon**(*self*, *name*, *zoom*)

Zooms to the given zoom level at the given polygon. The zoom parameter is ignored if the user zoomed in more already and the entire polygon is already visible.

**Parameters**

**name**: Name of the polygon.

(*type=str*)

**zoom**: (*type=int*)

**Inherited from *kivy.uix.widget.Widget***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

***Inherited from kivy.\_event.EventDispatcher***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

***Inherited from object***

`__delattr__()`, `__format__()`, `__getattribute__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

**4.5.2 Properties**

| Name  | Description   |
|---|---|
| scale   | Returns the current scalefaktor.<br>( <i>type=float</i> ) |
| viewport_pos                                    | Returns the current viewport position.                    |
| <i>Inherited from kivy.uix.widget.Widget</i>    |   |
| <code>__self__</code> , <code>proxy_ref</code>  |   |
| <i>Inherited from kivy._event.ObjectWithUid</i> |   |
| uid   |   |
| <i>Inherited from object</i>                    |   |
| <code>__class__</code>                          |   |

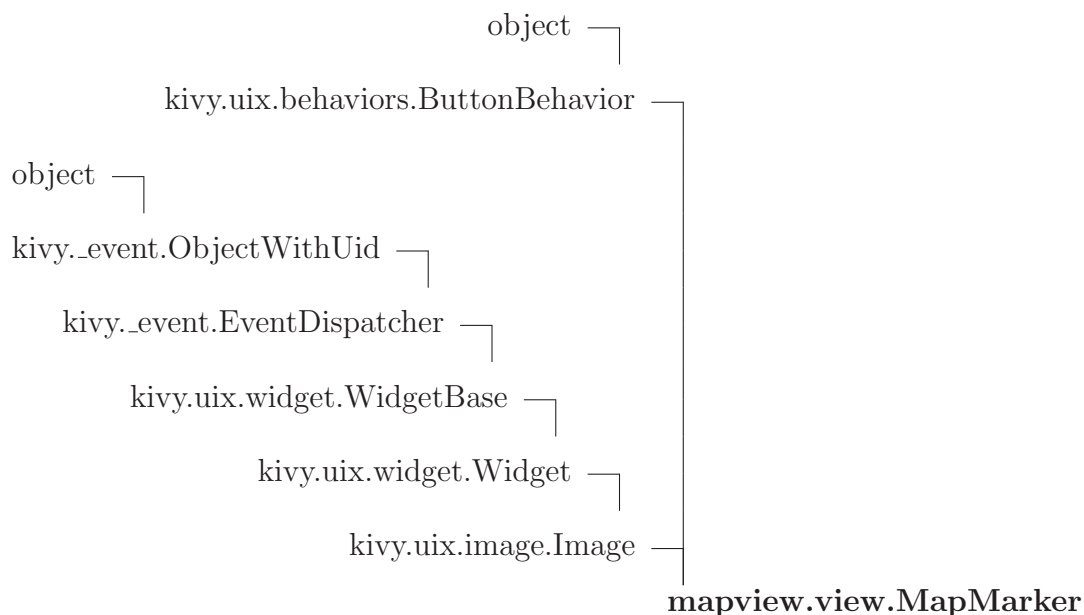
**4.5.3 Class Variables**

| Name                    | Description   |
|-------------------------|---|
| <code>__events__</code> | <b>Value:</b> ['on_map_relocated']  |
| background_color        | <b>Value:</b> <kivy.properties.ListProperty object at 0x00000000037EF948>   |
| bbox                    | <b>Value:</b> <kivy.properties.AliasProperty object at 0x00000000037E9448>  |
| delta_x                 | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037E...> |
| delta_y                 | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037E...> |
| double_tap_zoom         | <b>Value:</b> <kivy.properties.BooleanProperty object at 0x00000000037E...> |
| lat                     | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C...> |
| lon                     | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C...> |
| map_source              | <b>Value:</b> <kivy.properties.ObjectProperty object at 0x0000000003803...> |

*continued on next page*

| Name   | Description  |
|--|--|
| markers  | <b>Value:</b> <kivy.properties.BooleanProperty object at 0x00000000037E... |
| zoom   | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| <i>Inherited from kivy.uix.widget.Widget</i><br>canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |  |

## 4.6 Class MapMarker



**Known Subclasses:** `mapview.view.MapMarkerPopup`

A marker on a map, that must be used on a :class:‘MapMarker‘

### 4.6.1 Methods

```

__init__(self, **kwargs)

x.__init__(...) initializes x; see help(type(x)) for signature
Overrides: object.__init__ extit(inherited documentation)

```

*Inherited from kivy.uix.behaviors.ButtonBehavior*

on\_press(), on\_release(), on\_touch\_down(), on\_touch\_move(), on\_touch\_up(), trigger\_action()

### ***Inherited from kivy.uix.image.Image***

get\_image\_ratio(), get\_norm\_image\_size(), on\_anim\_delay(), on\_nocache(), on\_texture(), reload(), texture\_update()

### ***Inherited from kivy.uix.widget.Widget***

\_\_eq\_\_(), \_\_hash\_\_(), add\_widget(), clear\_widgets(), collide\_point(), collide\_widget(), get\_center\_x(), get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(), on\_opacity(), remove\_widget(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_local(), to\_parent(), to\_widget(), to\_window()

### ***Inherited from kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(), getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(), unbind(), unregister\_event\_types()

### ***Inherited from object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

#### **4.6.2 Properties**

| Name  | Description         |
|---|---------------------|
| default_marker_fn                               | ( <i>type=</i> str) |
| <i>Inherited from kivy.uix.widget.Widget</i>    |                     |
| __self__, proxy_ref                             |                     |
| <i>Inherited from kivy._event.ObjectWithUid</i> |                     |
| uid   |                     |
| <i>Inherited from object</i>                    |                     |
| __class__                                       |                     |

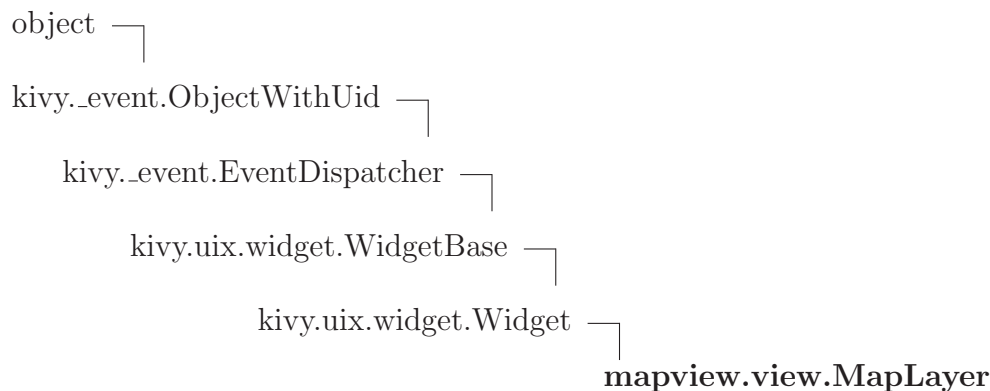
#### **4.6.3 Class Variables**

| Name     | Description  |
|----------|--|
| anchor_x | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| anchor_y | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| lat      | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |

*continued on next page*

| Name   | Description  |
|--|--|
| lon  | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| visible  | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| <i>Inherited from kivy.uix.behaviors.ButtonBehavior</i><br>last_touch, state   |  |
| <i>Inherited from kivy.uix.image.Image</i><br>allow_stretch, anim_delay, color, image_ratio, keep_data, keep_ratio, mipmap, nocache, norm_image_size, source, texture, texture_size  |  |
| <i>Inherited from kivy.uix.widget.Widget</i><br>__events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |  |

## 4.7 Class MapLayer



**Known Subclasses:** mapview.view.MarkerMapLayer, isySUR.gui.mapview.geojson.GeoJsonMapLayer

A map layer, that is repositionned everytime the :class:‘MapView’ is moved.

### 4.7.1 Methods

**reposition**(*self*)

Function called when :class:‘MapView’ is moved. You must recalculate the position of your children.

**unload**(*self*)

Called when the view want to completely unload the layer.



***Inherited from kivy.uix.widget.Widget***

`__eq__()`, `__hash__()`, `__init__()`, `add_widget()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `remove_widget()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

***Inherited from kivy.\_event.EventDispatcher***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

***Inherited from object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

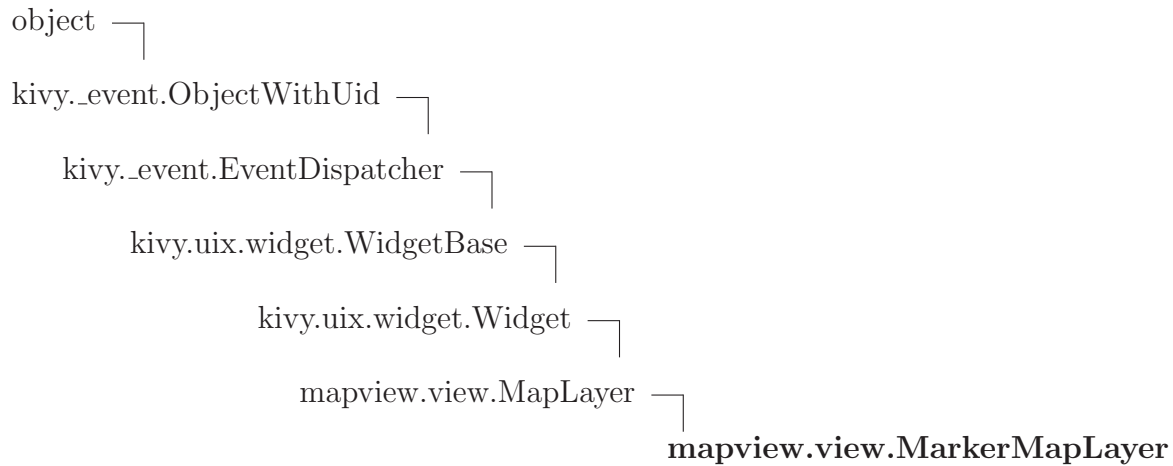
**4.7.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i>    |             |
| <code>__self__</code> , <code>proxy_ref</code>  |             |
| <i>Inherited from kivy._event.ObjectWithUid</i> |             |
| <code>uid</code>                                |             |
| <i>Inherited from object</i>                    |             |
| <code>__class__</code>                          |             |

**4.7.3 Class Variables**

| Name  | Description  |
|---|--|
| <code>viewport_x</code>   | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| <code>viewport_y</code>   | <b>Value:</b> <kivy.properties.NumericProperty object at 0x00000000037C... |
| <i>Inherited from kivy.uix.widget.Widget</i>  |  |
| <code>__events__</code> , <code>canvas</code> , <code>center</code> , <code>center_x</code> , <code>center_y</code> , <code>children</code> , <code>cls</code> , <code>disabled</code> , <code>height</code> , <code>id</code> , <code>ids</code> , <code>opacity</code> , <code>parent</code> , <code>pos</code> , <code>pos_hint</code> , <code>right</code> , <code>size</code> , <code>size_hint</code> , <code>size_hint_x</code> , <code>size_hint_y</code> , <code>top</code> , <code>width</code> , <code>x</code> , <code>y</code> |  |

## 4.8 Class `MarkerMapLayer`



A map layer for :class:‘MapMarker‘

### 4.8.1 Methods

**`__init__(self, **kwargs)`**

`x.__init__(...)` initializes `x`; see `help(type(x))` for signature

Overrides: `object.__init__` extit(inherited documentation)

**`add_widget(self, marker)`**

This function adds a marker to the `MapLayer`.

**Parameters**

**`marker`:** The marker to be added.

Overrides: `kivy.uix.widget.Widget.add_widget`

**`remove_widget(self, marker)`**

This function removes a marker to the `MapLayer`.

**Parameters**

**`marker`:** The marker to be removed.

Overrides: `kivy.uix.widget.Widget.remove_widget`

**reposition(*self*)**

This function recalculates the position of all markers on the current Layer, adds new marker if they are visible now and removes marker which not visible anymore.

Overrides: `mapview.view.MapLayer.reposition`

**set\_marker\_position(*self*, *mapview*, *marker*)**

This function sets the marker position in respect to the current mapview.

**Parameters**

**mapview:** The current mapview object.

(*type*=`view.MarkerMapLayer`)

**marker:** The marker for which the position should be set.

(*type*=`view.Marker`)

**unload(*self*)**

This function deletes all widgets on the current layer.

Overrides: `mapview.view.MapLayer.unload`

***Inherited from `kivy.uix.widget.Widget`***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

***Inherited from `kivy._event.EventDispatcher`***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

***Inherited from `object`***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

**4.8.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i> |             |
| <code>__self__</code> , <code>proxy_ref</code>            |             |

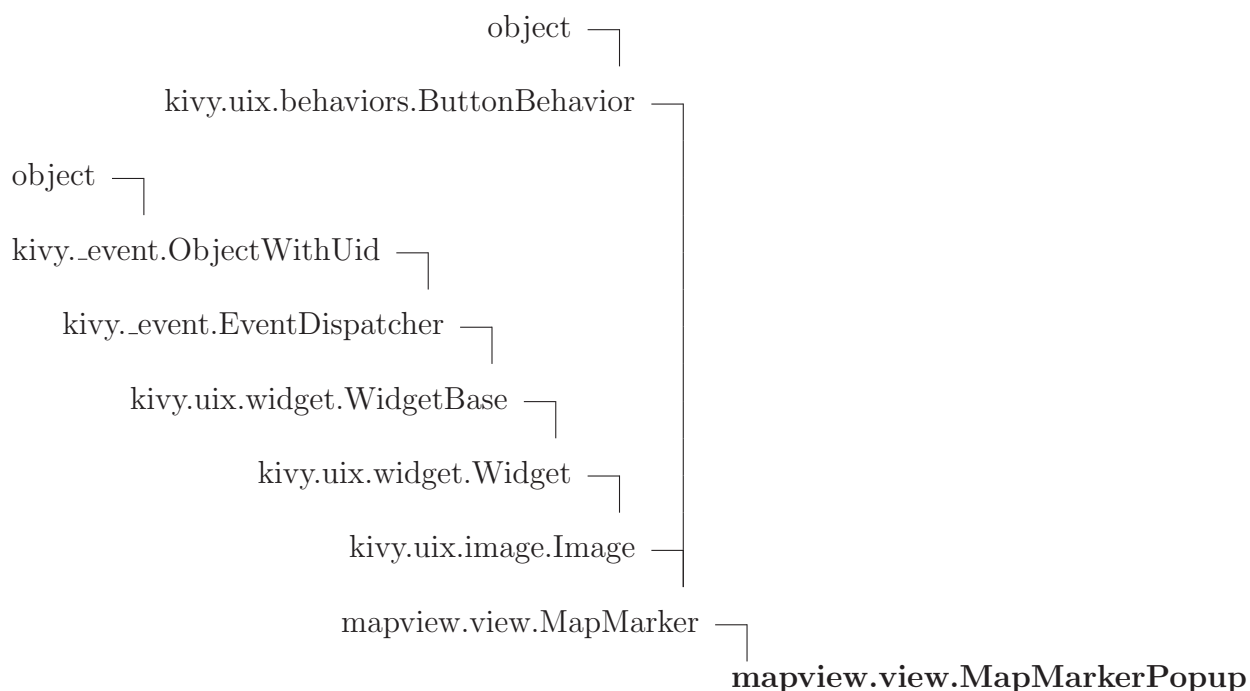
*continued on next page*

| Name  | Description            |
|---|------------------------|
| <i>Inherited from kivy._event.ObjectWithUid</i> | uid                    |
| <i>Inherited from object</i>                    | <code>__class__</code> |

#### 4.8.3 Class Variables

| Name  | Description  |
|---|--|
| <i>Inherited from mapview.view.MapLayer (Section 4.7)</i> | viewport_x, viewport_y   |
| <i>Inherited from kivy.uix.widget.Widget</i>              | <code>__events__</code> , canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |

### 4.9 Class MapMarkerPopup



## 4.9.1 Methods

**add\_widget**(*self*, *widget*)

This function adds a widget to the gui.

**Parameters**

**widget:** The widget to be added.

(*type=kivy.uix.widget.Widget*)

Overrides: kivy.uix.widget.Widget.add\_widget

**on\_is\_open**(*self*, \**args*)

on\_release Eventhandler

**Parameters**

**\*args:** Eventobject

**on\_release**(*self*, \**args*)

on\_release Eventhandler

**Parameters**

**\*args:** Eventobject

Overrides: kivy.uix.behaviors.ButtonBehavior.on\_release

**refresh\_open\_status**(*self*)

This function refreshes the open status from the gui elementes.

**remove\_widget**(*self*, *widget*)

This function removes a widget to the gui.

**Parameters**

**widget:** The widget to be removed.

(*type=kivy.uix.widget.Widget*)

Overrides: kivy.uix.widget.Widget.remove\_widget

*Inherited from mapview.view.MapMarker(Section 4.6)*

`__init__()`

*Inherited from kivy.uix.behaviors.ButtonBehavior*

`on_press()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `trigger_action()`

*Inherited from kivy.uix.image.Image*

get\_image\_ratio(), get\_norm\_image\_size(), on\_anim\_delay(), on\_nocache(), on\_texture(),  
reload(), texture\_update()

#### ***Inherited from kivy.uix.widget.Widget***

\_\_eq\_\_(), \_\_hash\_\_(), clear\_widgets(), collide\_point(), collide\_widget(), get\_center\_x(),  
get\_center\_y(), get\_parent\_window(), get\_right(), get\_root\_window(), get\_top(), on\_disabled(),  
on\_opacity(), set\_center\_x(), set\_center\_y(), set\_right(), set\_top(), to\_local(), to\_parent(),  
to\_widget(), to\_window()

#### ***Inherited from kivy.\_event.EventDispatcher***

\_\_new\_\_(), bind(), create\_property(), dispatch(), events(), get\_property\_observers(),  
getter(), is\_event\_type(), properties(), property(), register\_event\_type(), setter(),  
unbind(), unregister\_event\_types()

#### ***Inherited from object***

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_repr\_\_(),  
\_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

### **4.9.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from mapview.view.MapMarker (Section 4.6)</i><br>default_marker_fn |             |
| <i>Inherited from kivy.uix.widget.Widget</i><br>__self__, proxy_ref             |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br>uid                          |             |
| <i>Inherited from object</i><br>__class__                                       |             |

### **4.9.3 Class Variables**

| Name  | Description   |
|---|---|
| is_open   | <b>Value:</b> <kivy.properties.BooleanProperty<br>object at 0x00000000037C... |
| placeholder   | <b>Value:</b> <kivy.properties.ObjectProperty<br>object at 0x00000000037DE... |
| popup_size  | <b>Value:</b> <kivy.properties.ListProperty<br>object at 0x00000000037C0D08>  |
| <i>Inherited from mapview.view.MapMarker (Section 4.6)</i><br>anchor_x, anchor_y, lat, lon, visible |   |
| <i>Inherited from kivy.uix.behaviors.ButtonBehavior</i>   |   |

*continued on next page*

| Name   | Description |
|--|-------------|
| last_touch, state  |             |
| <i>Inherited from kivy.uix.image.Image</i>   |             |
| allow_stretch, anim_delay, color, image_ratio, keep_data, keep_ratio, mipmap, nocache, norm_image_size, source, texture, texture_size  |             |
| <i>Inherited from kivy.uix.widget.Widget</i>   |             |
| __events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |             |

## 5 Module isySUR.gui.mapview.downloader

### 5.1 Class Downloader



#### 5.1.1 Methods

|                   |
|-------------------|
| <b>instance()</b> |
|-------------------|

|   |
|---|
| <b>__init__(self, max_workers=5, cap_time=0.064)</b><br>x.__init__(...) initializes x; see help(type(x)) for signature<br>Overrides: object.__init__ extit(inherited documentation) |
|---|

|   |
|---|
| <b>submit(self, f, *args, **kwargs)</b> |
|---|

|                                  |
|----------------------------------|
| <b>download_tile(self, tile)</b> |
|----------------------------------|

|  |
|--|
| <b>download(self, url, callback, **kwargs)</b> |
|--|

#### *Inherited from object*

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_hash\_\_(), \_\_new\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(),  
 \_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

#### 5.1.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| __class__                    |             |



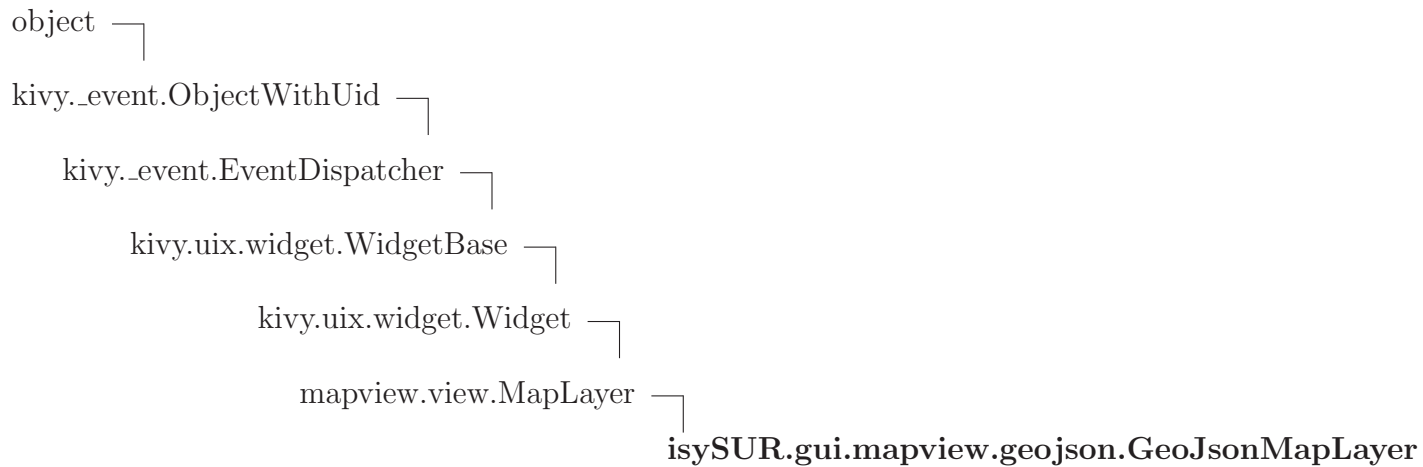
## 6 Module *isySUR.gui.mapview.geojson*

(section) Geojson layer

.. note:

Currently experimental and a work in progress. It requires the new Kivy's Tesselator, based on libtess2. See 'tesselator branch <<https://github.com/kivy/kivy/tree/tesselator>>' \_

### 6.1 Class *GeoJsonMapLayer*



#### 6.1.1 Methods

**reposition**(*self*)

Function called when :class:'MapView' is moved. You must recalculate the position of your children.

Overrides: *mapview.view.MapLayer.reposition* *extit*(inherited documentation)

**on\_geojson**(*self, instance, geojson*)

**on\_source**(*self, instance, value*)

*Inherited from mapview.view.MapLayer(Section 4.7)*

*unload*()

*Inherited from kivy.uix.widget.Widget*

`__eq__()`, `__hash__()`, `__init__()`, `add_widget()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `remove_widget()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

### ***Inherited from `kivy._event.EventDispatcher`***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

### ***Inherited from `object`***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

## **6.1.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i><br><code>__self__</code> , <code>proxy_ref</code> |             |
| <i>Inherited from <code>kivy._event.ObjectWithUid</code></i><br><code>uid</code>                            |             |
| <i>Inherited from <code>object</code></i><br><code>__class__</code>   |             |

## **6.1.3 Class Variables**

| Name   | Description                                 |
|--|---|
| <code>source</code>  | <b>Value:</b> <code>StringProperty()</code> |
| <code>geojson</code>   | <b>Value:</b> <code>ObjectProperty()</code> |
| <i>Inherited from <code>mapview.view.MapLayer</code> (Section 4.7)</i><br><code>viewport_x</code> , <code>viewport_y</code>  |   |
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i><br><code>__events__</code> , <code>canvas</code> , <code>center</code> , <code>center_x</code> , <code>center_y</code> , <code>children</code> , <code>cls</code> , <code>disabled</code> , <code>height</code> , <code>id</code> , <code>ids</code> , <code>opacity</code> , <code>parent</code> , <code>pos</code> , <code>pos_hint</code> , <code>right</code> , <code>size</code> , <code>size_hint</code> , <code>size_hint_x</code> , <code>size_hint_y</code> , <code>top</code> , <code>width</code> , <code>x</code> , <code>y</code> |   |

## 7 Module isySUR.gui.mapview.mbtsource

(section) MBTiles provider for MapView

This provider is based on .mbfiles from MapBox. See: <http://mbtiles.org/>

### 7.1 Class MBTilesMapSource



#### 7.1.1 Methods

**\_\_init\_\_(self, filename)**

x.\_\_init\_\_(...) initializes x; see help(type(x)) for signature

Overrides: object.\_\_init\_\_ extit(inherited documentation)

**fill\_tile(self, tile)**

Add this tile to load within the downloader

Overrides: mapview.source.MapSource.fill\_tile extit(inherited documentation)

**Inherited from mapview.source.MapSource(Section 4.4)**

from\_provider(), get\_col\_count(), get\_lat(), get\_lon(), get\_max\_zoom(), get\_min\_zoom(),  
get\_row\_count(), get\_x(), get\_y()

**Inherited from object**

\_\_delattr\_\_(), \_\_format\_\_(), \_\_getattr\_\_(), \_\_hash\_\_(), \_\_new\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(),  
\_\_repr\_\_(), \_\_setattr\_\_(), \_\_sizeof\_\_(), \_\_str\_\_(), \_\_subclasshook\_\_()

#### 7.1.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| __class__                    |             |

### 7.1.3 Class Variables

| Name  | Description |
|---|-------------|
| <i>Inherited from mapview.source.MapSource (Section 4.4)</i><br>providers |             |

## 8 Module *isySUR.gui.mapview.source*

### 8.1 Class MapSource

object —  
***isySUR.gui.mapview.source.MapSource***

Base class for implementing a map source / provider

#### 8.1.1 Methods

```
__init__(self,
url='http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png',
cache_key=None, min_zoom=0, max_zoom=19, tile_size=256,
image_ext='png', attribution='\xc2\xa9 OpenStreetMap contributors',
subdomains='abc')
```

`x.__init__(...)` initializes `x`; see `help(type(x))` for signature  
 Overrides: `object.__init__` `extit`(inherited documentation)

```
from_provider(key)
```

```
get_x(self, zoom, lon)
```

Get the x position on the map using this map source's projection (0, 0) is located at the top left.

```
get_y(self, zoom, lat)
```

Get the y position on the map using this map source's projection (0, 0) is located at the top left.

```
get_lon(self, zoom, x)
```

Get the longitude to the x position in the map source's projection

```
get_lat(self, zoom, y)
```

Get the latitude to the y position in the map source's projection

```
get_row_count(self, zoom)
```

Get the number of tiles in a row at this zoom level

|  |
|--|
| <b>get_col_count</b> ( <i>self</i> , <i>zoom</i> ) |
|--|

|   |
|---|
| Get the number of tiles in a col at this zoom level |
|---|

|                                     |
|-------------------------------------|
| <b>get_min_zoom</b> ( <i>self</i> ) |
|-------------------------------------|

|  |
|--|
| Return the minimum zoom of this source |
|--|

|                                     |
|-------------------------------------|
| <b>get_max_zoom</b> ( <i>self</i> ) |
|-------------------------------------|

|  |
|--|
| Return the maximum zoom of this source |
|--|

|  |
|--|
| <b>fill_tile</b> ( <i>self</i> , <i>tile</i> ) |
|--|

|   |
|---|
| Add this tile to load within the downloader |
|---|

### *Inherited from object*

`__delattr__()`, `__format__()`, `__getattr__()`, `__hash__()`, `__new__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

#### 8.1.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| <code>__class__</code>       |             |

#### 8.1.3 Class Variables

| Name                   | Description  |
|------------------------|--|
| <code>providers</code> | <b>Value:</b> {'cyclemap': (0, 0, 17, 'http://{s}.tile.opencyclemap.org... |

## 9 Module *isySUR.gui.mapview.types*

### 9.1 Class *Coordinate*



*Coordinate*(lat, lon)

#### 9.1.1 Methods

**`--getnewargs--(self)`**

Return self as a plain tuple. Used by copy and pickle.

Overrides: `tuple.__getnewargs__`

**`--getstate--(self)`**

Exclude the `OrderedDict` from pickling

**`--new--(cls, lat, lon)`**

Create new instance of *Coordinate*(lat, lon)

**Return Value**

a new object with type *S*, a subtype of *T*

Overrides: `object.__new__`

**`--repr--(self)`**

Return a nicely formatted representation string

Overrides: `object.__repr__`

#### *Inherited from tuple*

`--add--()`, `--contains--()`, `--eq--()`, `--ge--()`, `--getattribute--()`, `--getitem--()`, `--getslice--()`,  
`--gt--()`, `--hash--()`, `--iter--()`, `--le--()`, `--len--()`, `--lt--()`, `--mul--()`, `--ne--()`, `--rmul--()`,  
`--sizeof--()`, `count()`, `index()`

#### *Inherited from object*

`--delattr--()`, `--format--()`, `--init--()`, `--reduce--()`, `--reduce_ex--()`, `--setattr--()`, `--str--()`,  
`--subclasshook--()`

### 9.1.2 Properties

| Name                         | Description              |
|------------------------------|--------------------------|
| lat                          | Alias for field number 0 |
| lon                          | Alias for field number 1 |
| <i>Inherited from object</i> |                          |
| __class__                    |                          |

## 9.2 Class Bbox



### 9.2.1 Methods

|                                   |
|-----------------------------------|
| <code>collide(self, *args)</code> |
|-----------------------------------|

#### *Inherited from tuple*

\_\_add\_\_(), \_\_contains\_\_(), \_\_eq\_\_(), \_\_ge\_\_(), \_\_getattr\_\_(), \_\_getitem\_\_(), \_\_getnewargs\_\_(),  
 \_\_getslice\_\_(), \_\_gt\_\_(), \_\_hash\_\_(), \_\_iter\_\_(), \_\_le\_\_(), \_\_len\_\_(), \_\_lt\_\_(), \_\_mul\_\_(),  
 \_\_ne\_\_(), \_\_new\_\_(), \_\_repr\_\_(), \_\_rmul\_\_(), \_\_sizeof\_\_(), count(), index()

#### *Inherited from object*

\_\_delattr\_\_(), \_\_format\_\_(), \_\_init\_\_(), \_\_reduce\_\_(), \_\_reduce\_ex\_\_(), \_\_setattr\_\_(), \_\_str\_\_(),  
 \_\_subclasshook\_\_()

### 9.2.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| __class__                    |             |



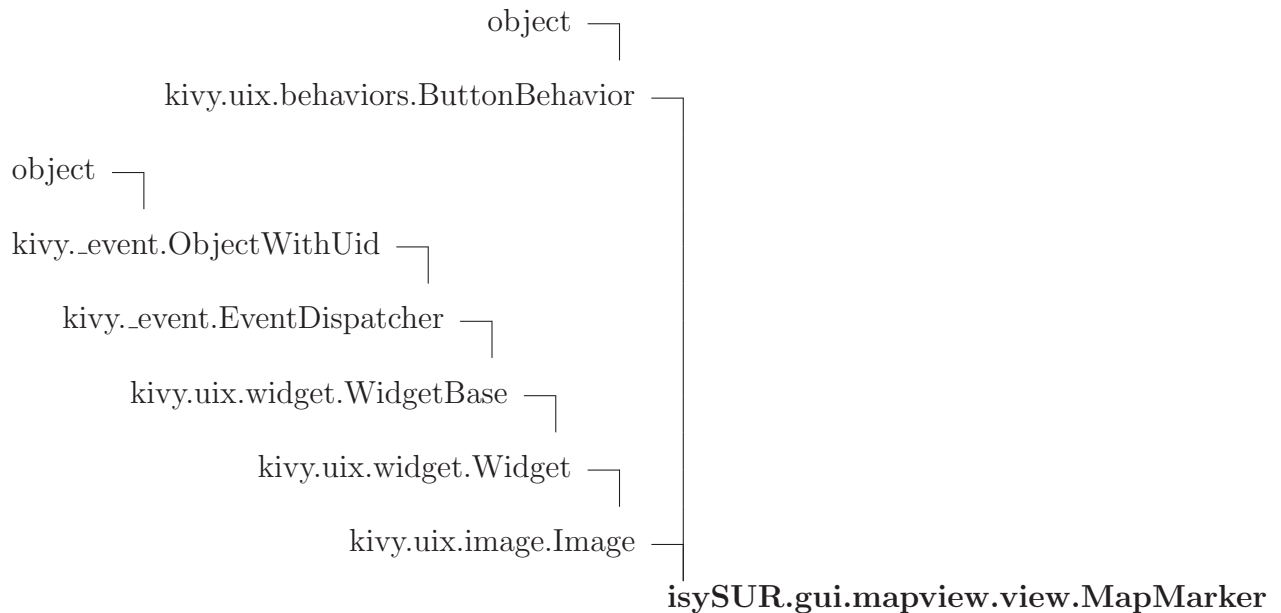
## 10 Module *isySUR.gui.mapview.utils*

### 10.1 Functions

|  |
|--|
| <b>clamp</b> ( $x$ , <i>minimum</i> , <i>maximum</i> ) |
|--|

## 11 Module `isySUR.gui.mapview.view`

### 11.1 Class `MapMarker`



**Known Subclasses:** `isySUR.gui.mapview.view.MapMarkerPopup`

A marker on a map, that must be used on a :class:‘`MapMarker`‘

#### 11.1.1 Methods

**`__init__(self, **kwargs)`**  
`x.__init__(...)` initializes `x`; see `help(type(x))` for signature  
 Overrides: `object.__init__` `extit`(inherited documentation)

**Inherited from `kivy.uix.behaviors.ButtonBehavior`**

`on_press()`, `on_release()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `trigger_action()`

**Inherited from `kivy.uix.image.Image`**

`get_image_ratio()`, `get_norm_image_size()`, `on_anim_delay()`, `on_nocache()`, `on_texture()`, `reload()`, `texture_update()`

**Inherited from `kivy.uix.widget.Widget`**

`__eq__()`, `__hash__()`, `add_widget()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `remove_widget()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

### ***Inherited from `kivy._event.EventDispatcher`***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

### ***Inherited from `object`***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

#### **11.1.2 Properties**

| Name   | Description       |
|--|-------------------|
| <code>default_marker_fn</code>                               | <i>(type=str)</i> |
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i>    |                   |
| <code>__self__</code> , <code>proxy_ref</code>               |                   |
| <i>Inherited from <code>kivy._event.ObjectWithUid</code></i> |                   |
| <code>uid</code>   |                   |
| <i>Inherited from <code>object</code></i>                    |                   |
| <code>__class__</code>                                       |                   |

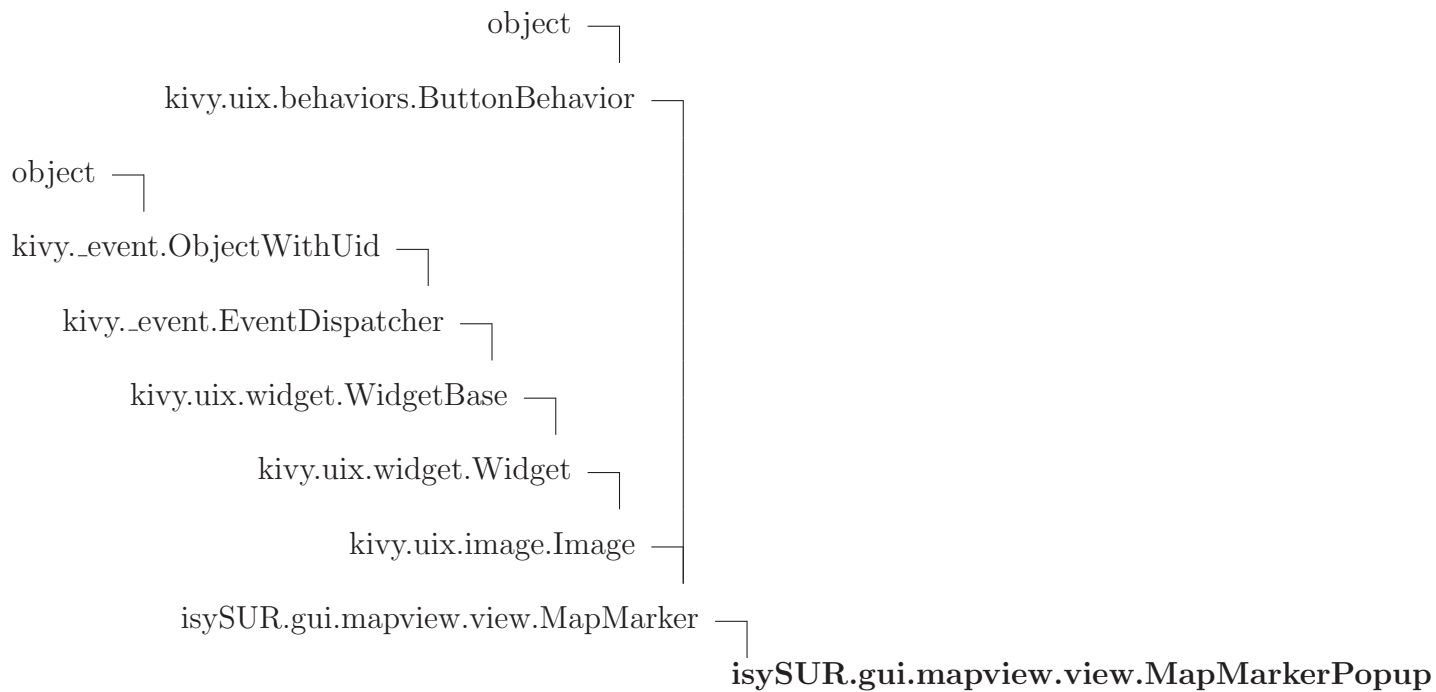
#### **11.1.3 Class Variables**

| Name   | Description   |
|--|---|
| <code>anchor_x</code>  | Anchor of the marker on the X axis. Defaults to 0.5, mean the anchor will be at the X center of the image.<br><b>Value:</b> <code>NumericProperty(0.5)</code> |
| <code>anchor_y</code>  | Anchor of the marker on the Y axis. Defaults to 0, mean the anchor will be at the Y bottom of the image.<br><b>Value:</b> <code>NumericProperty(0)</code>     |
| <code>lat</code>   | Latitude of the marker<br><b>Value:</b> <code>NumericProperty(0)</code>   |
| <code>lon</code>   | Longitude of the marker<br><b>Value:</b> <code>NumericProperty(0)</code>  |
| <code>visible</code>   | <b>Value:</b> <code>NumericProperty(1)</code>   |
| <i>Inherited from <code>kivy.uix.behaviors.ButtonBehavior</code></i> |   |

*continued on next page*

| Name   | Description |
|--|-------------|
| last_touch, state  |             |
| <i>Inherited from kivy.uix.image.Image</i>   |             |
| allow_stretch, anim_delay, color, image_ratio, keep_data, keep_ratio, mipmap, nocache, norm_image_size, source, texture, texture_size  |             |
| <i>Inherited from kivy.uix.widget.Widget</i>   |             |
| __events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |             |

## 11.2 Class MapMarkerPopup



### 11.2.1 Methods

|   |
|---|
| <b>add_widget(<i>self</i>, <i>widget</i>)</b><br><hr/> This function adds a widget to the gui.<br><b>Parameters</b><br><i>widget</i> : The widget to be added.<br>( <i>type=kivy.uix.widget.Widget</i> )<br>Overrides: <code>kivy.uix.widget.Widget.add_widget</code> |
|---|

---

**remove\_widget**(*self*, *widget*)

---

This function removes a widget to the gui.
**Parameters**
**widget**: The widget to be removed.

*(type=kivy.uix.widget.Widget)*


---

Overrides: kivy.uix.widget.Widget.remove\_widget

---

**on\_is\_open**(*self*, \**args*)

---

on\_release Eventhandler
**Parameters**
**\*args**: Eventobject

---

**on\_release**(*self*, \**args*)

---

on\_release Eventhandler
**Parameters**
**\*args**: Eventobject

---

Overrides: kivy.uix.behaviors.ButtonBehavior.on\_release

---

**refresh\_open\_status**(*self*)

---

This function refreshes the open status from the gui elementes.

**Inherited from *isySUR.gui.mapview.view.MapMarker*(Section 11.1)**

`__init__()`

**Inherited from *kivy.uix.behaviors.ButtonBehavior***

`on_press()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `trigger_action()`

**Inherited from *kivy.uix.image.Image***

`get_image_ratio()`, `get_norm_image_size()`, `on_anim_delay()`, `on_nocache()`, `on_texture()`, `reload()`, `texture_update()`

**Inherited from *kivy.uix.widget.Widget***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

**Inherited from *kivy.\_event.EventDispatcher***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

### ***Inherited from object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

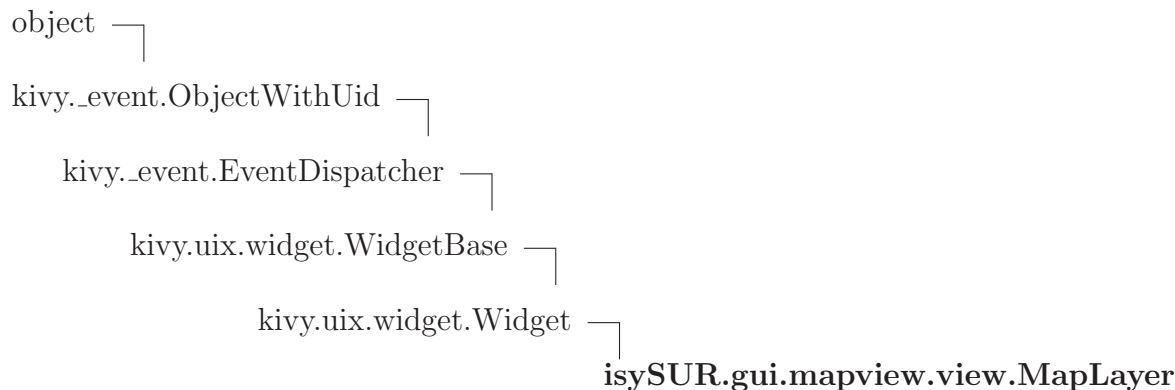
#### **11.2.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from isySUR.gui.mapview.view.MapMarker (Section 11.1)</i><br>default_marker_fn |             |
| <i>Inherited from kivy.uix.widget.Widget</i><br>__self__, proxy_ref                         |             |
| <i>Inherited from kivy._event.ObjectWithUid</i><br>uid                                      |             |
| <i>Inherited from object</i><br>__class__   |             |

#### **11.2.3 Class Variables**

| Name   | Description                            |
|--|--|
| is_open  | <b>Value:</b> BooleanProperty(False)   |
| placeholder  | <b>Value:</b> ObjectProperty(None)     |
| popup_size   | <b>Value:</b> ListProperty([100, 100]) |
| <i>Inherited from isySUR.gui.mapview.view.MapMarker (Section 11.1)</i><br>anchor_x, anchor_y, lat, lon, visible  |  |
| <i>Inherited from kivy.uix.behaviors.ButtonBehavior</i><br>last_touch, state   |  |
| <i>Inherited from kivy.uix.image.Image</i><br>allow_stretch, anim_delay, color, image_ratio, keep_data, keep_ratio, mipmap, nocache, norm_image_size, source, texture, texture_size  |  |
| <i>Inherited from kivy.uix.widget.Widget</i><br>__events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |  |

### 11.3 Class MapLayer



**Known Subclasses:** isySUR.gui.mapview.view.MarkerMapLayer, isySUR.gui.mapview.view.PolyMapLayer

A map layer, that is repositionned everytime the :class:‘MapView’ is moved.

#### 11.3.1 Methods

##### **reposition(*self*)**

Function called when :class:‘MapView’ is moved. You must recalculate the position of your children.

##### **unload(*self*)**

Called when the view want to completely unload the layer.

#### ***Inherited from kivy.uix.widget.Widget***

`__eq__()`, `__hash__()`, `__init__()`, `add_widget()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `remove_widget()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

#### ***Inherited from kivy.\_event.EventDispatcher***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

#### ***Inherited from object***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

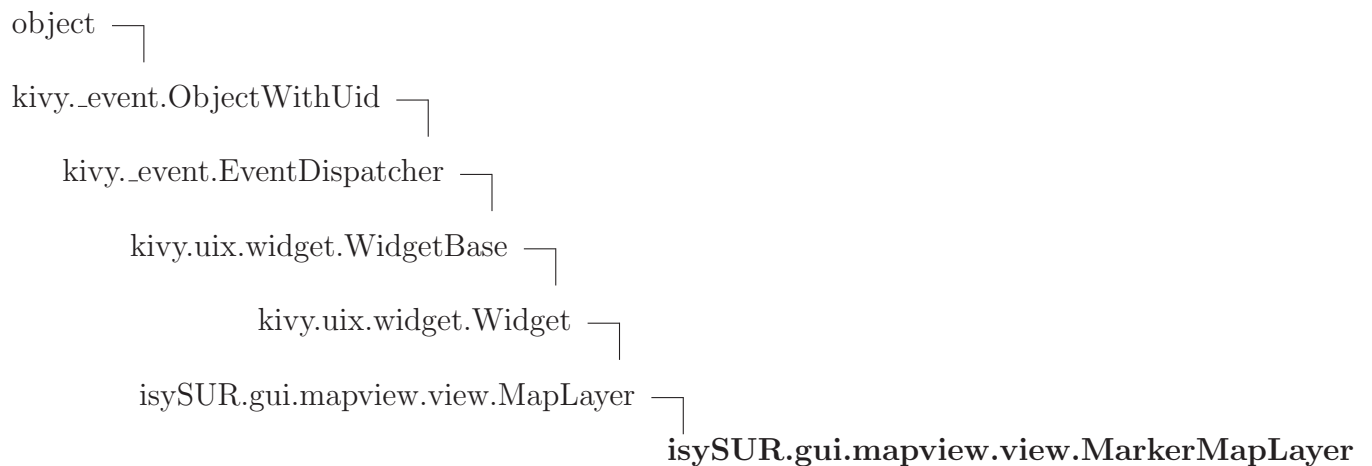
### 11.3.2 Properties

| Name  | Description |
|---|-------------|
| <i>Inherited from kivy.uix.widget.Widget</i>    |             |
| __self__, proxy_ref                             |             |
| <i>Inherited from kivy._event.ObjectWithUid</i> |             |
| uid   |             |
| <i>Inherited from object</i>                    |             |
| __class__                                       |             |

### 11.3.3 Class Variables

| Name   | Description                      |
|--|----------------------------------|
| viewport_x   | <b>Value:</b> NumericProperty(0) |
| viewport_y   | <b>Value:</b> NumericProperty(0) |
| <i>Inherited from kivy.uix.widget.Widget</i>   |                                  |
| __events__, canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |                                  |

## 11.4 Class MarkerMapLayer



A map layer for :class:'MapMarker'



## 11.4.1 Methods

**`__init__(self, **kwargs)`**

`x.__init__(...)` initializes `x`; see `help(type(x))` for signature

Overrides: `object.__init__` `extit`(inherited documentation)

**`add_widget(self, marker)`**

This function adds a marker to the MapLayer.

**Parameters**

**marker:** The marker to be added.

Overrides: `kivy.uix.widget.Widget.add_widget`

**`remove_widget(self, marker)`**

This function removes a marker to the MapLayer.

**Parameters**

**marker:** The marker to be removed.

Overrides: `kivy.uix.widget.Widget.remove_widget`

**`reposition(self)`**

This function recalculates the position of all markers on the current Layer, adds new marker if they are visible now and removes marker which not visible anymore.

Overrides: `isySUR.gui.mapview.view.MapLayer.reposition`

**`set_marker_position(self, mapview, marker)`**

This function sets the marker position in respect to the current mapview.

**Parameters**

**mapview:** The current mapview object.

(*type=*`view.MarkerMapLayer`)

**marker:** The marker for which the position should be set.

(*type=*`view.Marker`)

**`unload(self)`**

This function deletes all widgets on the current layer.

Overrides: `isySUR.gui.mapview.view.MapLayer.unload`

***Inherited from `kivy.uix.widget.Widget`***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_down()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

***Inherited from `kivy._event.EventDispatcher`***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

***Inherited from `object`***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

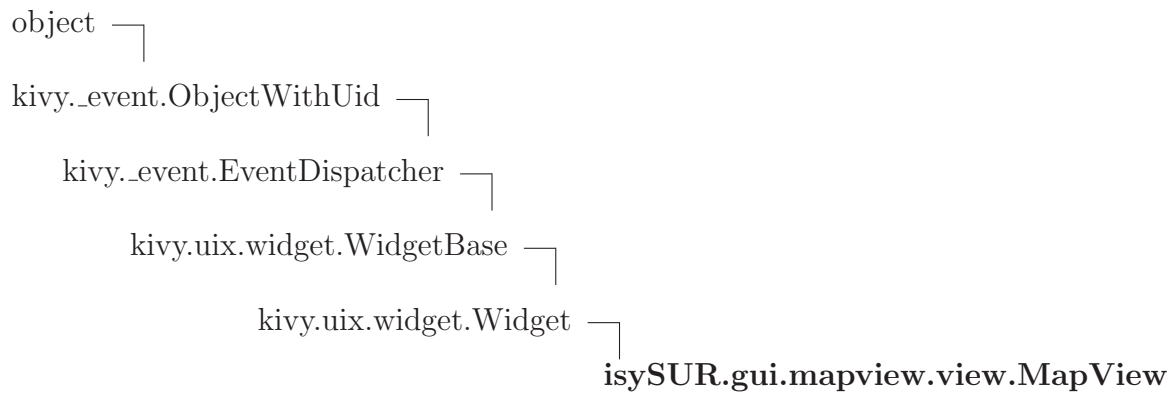
**11.4.2 Properties**

| Name  | Description |
|---|-------------|
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i><br><code>__self__</code> , <code>proxy_ref</code> |             |
| <i>Inherited from <code>kivy._event.ObjectWithUid</code></i><br><code>uid</code>                            |             |
| <i>Inherited from <code>object</code></i><br><code>__class__</code>   |             |

**11.4.3 Class Variables**

| Name   | Description |
|--|-------------|
| <i>Inherited from <code>isySUR.gui.mapview.view.MapLayer</code> (Section 11.3)</i><br><code>viewport_x</code> , <code>viewport_y</code>  |             |
| <i>Inherited from <code>kivy.uix.widget.Widget</code></i><br><code>__events__</code> , <code>canvas</code> , <code>center</code> , <code>center_x</code> , <code>center_y</code> , <code>children</code> , <code>cls</code> , <code>disabled</code> , <code>height</code> , <code>id</code> , <code>ids</code> , <code>opacity</code> , <code>parent</code> , <code>pos</code> , <code>pos_hint</code> , <code>right</code> , <code>size</code> , <code>size_hint</code> , <code>size_hint_x</code> , <code>size_hint_y</code> , <code>top</code> , <code>width</code> , <code>x</code> , <code>y</code> |             |

## 11.5 Class MapView



MapView is the widget that control the map displaying, navigation, and layers management.

### 11.5.1 Methods

**get\_bbox**(*self*, *margin=0*)

Returns the bounding box from the bottom/left (lat1, lon1) to top/right (lat2, lon2).

**Parameters**

**margin:** (Optional) addition margin for the boundingbox.

**Return Value**

The boundingbox. @rtype mapview.Bbox

**unload**(*self*)

Unload the view and all the layers. It also cancel all the remaining downloads.

**get\_window\_xy\_from**(*self*, *lat*, *lon*, *zoom*)

Returns the x/y position in the widget absolute coordinates from a lat/lon.

**Return Value**

The x/y position in the widget.

(*type=*float,float)

**center\_on**(*self*, \**args*)

Center the map on the coordinate :class:'Coordinate', or a (lat, lon.

---

**set\_zoom\_at**(*self*, *zoom*, *x*, *y*, *scale*=None)

---

Sets the zoom level, leaving the (x, y) at the exact same point in the view.

**Parameters**

**zoom:** *t* The zoom level.  
**type:** *int*  
**x:** The x-coordinate of the point.  
*(type=float)*  
**y:** The y-coordinate of the point.  
*(type=float)*  
**scale:** (Optinal) the scalefaktor for the scatter.  
*(type=int)*

---

**zoom\_to**(*self*, *lat*, *lon*, *zoom*)

---

Zooms to the given zoom level at the given position.

**Parameters**

**lat:** Lat-coordinate of the given position.  
*(type=float)*  
**lon:** Lon-coordinate of the given position.  
*(type=float)*  
**zoom:** Zoom-factor.  
*(type=int)*

---

**zoom\_to\_Polygon**(*self*, *name*, *zoom*)

---

Zooms to the given zoom level at the given polygon. The zoom parameter is ignored if the user zoomed in more already and the entire polygon is already visible.

**Parameters**

**name:** Name of the polygon.  
*(type=str)*  
**zoom:** *(type=int)*

---

**on\_zoom**(*self*, *instance*, *zoom*)

---

on\_zoom Event handler

---

---

**get\_latlon\_at**(*self*, *x*, *y*, *zoom=None*)

---

 Return the current :class:‘Coordinate’ within the (x, y) widget coordinate.

**Parameters**

**x**: The x-coordinate of the point.

(*type=float*)

**y**: The y-coordinate of the point.

(*type=float*)

**Return Value**

The current Coordinate within the (x,y) widget coordinate.

(*type=mapview.Coordinate*)

---

**add\_marker**(*self*, *marker*, *layer=None*)

---

 Add a marker onto the layer. If layer is None, it will be added in the default marker layer. If there is no default marker layer, a new one will be automatically created.

**Parameters**

**marker**: The marker to be added.

(*type=view.MapMarker*)

**layer**: (Optional) the layer the marker should be added to.

(*type=view.MarkerMapLayer*)

---

**drawPolygon**(*self*)

---

 Draws a Polygon onto the Map.

---

**isPolyInView**(*self*, *name*)

---

 This function proves if a polygon is in the current viewspace.

**Parameters**

**name**: The name of the polygon.

(*type=str*)

**Return Value**

True if in viewspace otherwise False.

(*type=boolean*)

**isPolyVisible**(*self*, *name*)

This function proves if a polygon is completely visible in viewspace.

**Parameters**

**name:** The name of the polygon.  
(*type=**str*)

**Return Value**

True if completely in viewspace otherwise False.  
(*type=**boolean*)

**addPolygon**(*self*, *name*, *polygon*, *color*, *markerCoords*)

Adds and draws a new polygon onto the map.

**Parameters**

**name:** Name of the polygon to be added.  
(*type=**str*)

**polygon:** List of vertices of the polygon.  
(*type=**[(float, float)]*)

**color:** Style value of KML  
(*type=**dict*)

**markerCoords:** Coordinates of the SUR.  
(*type=**Tuple(float, float)*)

**hideMarkers**(*self*)

Hides all markers on the Marker Layer.

**showMarkers**(*self*)

Shows all markers.

**getBBoxOfPolygon**(*self*, *polygon*)

This function calculates a boundingbox in respect to the given polygon.

**Parameters**

**polygon:** The polygon for which the bbox should be computed, e.g.  
*[(1.0,2.0),(2.0,1.0),(1.0,1.0),(1.0,2.0)]*.

**Return Value**

The calculated bbox, e.g. *[minLat,minLon, maxLat,maxLon]*.  
(*type=**[float,float,float,float]*)

**showPolygon**(*self*, *name*)

Makes a polygon visible on the Map.

**Parameters**

**name:** Name of the polygon to be shown.

(*type=*str)

**hidePolygon**(*self*, *name*)

Removes a polygon from the Map.

**Parameters**

**name:** Name of the polygon to be removed.

(*type=*str)

**convertKMLColor**(*self*, *kmlColor*)

Convert a KML Color to its rgba value between 0 and 1.

**Parameters**

**kmlColor:** Color to be converted.

(*type=*str)

**Return Value**

Returns the rgba values of kmlColor.

**remove\_marker**(*self*, *marker*)

Remove a marker from its layer.

**add\_layer**(*self*, *layer*, *mode*=**'window'**)

Add a new layer to update at the same time the base tile layer. *mode* can be either "scatter" or "window". If "scatter", it means the layer will be within the scatter transformation. It's perfect if you want to display path / shape, but not for text. If "window", it will have no transformation. You need to position the widget yourself: think as Z-sprite / billboard. Defaults to "window".

**Parameters**

**layer:** The layer for updating.

(*type=kivy.uix.widget.Widget*)

**mode:** (Optional) The mode for updating could be "scatter" or "window".

(*type=*str)

---

**remove\_layer**(*self*, *layer*)

---

 Remove the layer.

**Parameters**
**layer**: The layer to be removed. @type kivy.uix.widget.Widget

---

**sync\_to**(*self*, *other*)

---

 Reflect the lat/lon/zoom of the other MapView to the current one.

---

**\_\_init\_\_**(*self*, **\*\*kwargs**)

x.\_\_init\_\_(...) initializes x; see help(type(x)) for signature

Overrides: object.\_\_init\_\_ extit(inherited documentation)

---

**add\_widget**(*self*, *widget*)

Add a new widget as a child of this widget.

**:Parameters:**
**'widget'**: :class:'Widget'

Widget to add to our list of children.

**'index'**: int, defaults to 0

\*(this attribute was added in 1.0.5)\*

Index to insert the widget in the list

```
>>> from kivy.uix.button import Button
```

```
>>> from kivy.uix.slider import Slider
```

```
>>> root = Widget()
```

```
>>> root.add_widget(Button())
```

```
>>> slider = Slider()
```

```
>>> root.add_widget(slider)
```

Overrides: kivy.uix.widget.Widget.add\_widget extit(inherited documentation)



```
remove_widget(self, widget)
```

Remove a widget from the children of this widget.

:Parameters:

    'widget': :class:'Widget'

        Widget to remove from our children list.

```
>>> from kivy.uix.button import Button
```

```
>>> root = Widget()
```

```
>>> button = Button()
```

```
>>> root.add_widget(button)
```

```
>>> root.remove_widget(button)
```

Overrides: kivy.uix.widget.Widget.remove\_widget extit(inherited documentation)

```
on_map_relocated(self, zoom, coord)
```

```
animated_diff_scale_at(self, d, x, y)
```

```
diff_scale_at(self, d, x, y)
```

```
scale_at(self, scale, x, y)
```

```
on_touch_down(self, touch)
```

Receive a touch down event.

:Parameters:

    'touch': :class:'~kivy.input.motionEvent' class

        Touch received. The touch is in parent coordinates. See

        :mod:'~kivy.uix.relativelayout' for a discussion on  
        coordinate systems.

:Returns:

    bool. If True, the dispatching of the touch event will stop.

Overrides: kivy.uix.widget.Widget.on\_touch\_down extit(inherited documentation)

```
on_transform(self, *args)
```

```
trigger_update(self, full)
```

`do_update(self, dt)``bbox_for_zoom(self, vx, vy, w, h, zoom)``load_visible_tiles(self)``load_tile(self, x, y, size, zoom)``load_tile_for_source(self, map_source, opacity, size, x, y, zoom)``move_tiles_to_background(self)``remove_all_tiles(self)``tile_map_set(self, tile_x, tile_y, value)``tile_in_tile_map(self, tile_x, tile_y)``on_size(self, instance, size)``on_pos(self, instance, pos)``on_map_source(self, instance, source)``cleanUpCache(self)`***Inherited from `kivy.uix.widget.Widget`***

`__eq__()`, `__hash__()`, `clear_widgets()`, `collide_point()`, `collide_widget()`, `get_center_x()`, `get_center_y()`, `get_parent_window()`, `get_right()`, `get_root_window()`, `get_top()`, `on_disabled()`, `on_opacity()`, `on_touch_move()`, `on_touch_up()`, `set_center_x()`, `set_center_y()`, `set_right()`, `set_top()`, `to_local()`, `to_parent()`, `to_widget()`, `to_window()`

***Inherited from `kivy._event.EventDispatcher`***

`__new__()`, `bind()`, `create_property()`, `dispatch()`, `events()`, `get_property_observers()`, `getter()`, `is_event_type()`, `properties()`, `property()`, `register_event_type()`, `setter()`, `unbind()`, `unregister_event_types()`

***Inherited from `object`***

`__delattr__()`, `__format__()`, `__getattr__()`, `__reduce__()`, `__reduce_ex__()`, `__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

## 11.5.2 Properties

| Name  | Description   |
|---|---|
| viewport_pos                                    | Returns the current viewport position.                    |
| scale   | Returns the current scalefaktor.<br>( <i>type=float</i> ) |
| <i>Inherited from kivy.uix.widget.Widget</i>    |   |
| __self__, proxy_ref                             |   |
| <i>Inherited from kivy._event.ObjectWithUid</i> |   |
| uid   |   |
| <i>Inherited from object</i>                    |   |
| __class__                                       |   |

## 11.5.3 Class Variables

| Name   | Description  |
|--|--|
| lon  | Longitude at the center of the widget<br><b>Value:</b> NumericProperty()   |
| lat  | Latitude at the center of the widget<br><b>Value:</b> NumericProperty()  |
| zoom   | Zoom of the widget. Must be between :meth:'MapSource.get_min_zoom' and :meth:'MapSource.get_max_zoom'. Default to 0.<br><b>Value:</b> NumericProperty(0) |
| map_source                                   | Provider of the map, default to a empty :class:'MapSource'.<br><b>Value:</b> ObjectProperty(MapSource())   |
| double_tap_zoom                              | If True, this will activate the double-tap to zoom.<br><b>Value:</b> BooleanProperty(False)  |
| markers                                      | The list of markers which belongs to the current MapView object<br><b>Value:</b> BooleanProperty(True)   |
| delta_x                                      | <b>Value:</b> NumericProperty(0)   |
| delta_y                                      | <b>Value:</b> NumericProperty(0)   |
| background_color                             | <b>Value:</b> ListProperty([181/ 255., 208/ 255., 208/ 255., 1])   |
| __events__                                   | <b>Value:</b> ['on_map_relocated']   |
| bbox   | <b>Value:</b> AliasProperty(get_bbox, None, bind= ["lat", "lon", "_zoom"])   |
| <i>Inherited from kivy.uix.widget.Widget</i> |  |

continued on next page

| Name | Description  |
|------|--|
|      | canvas, center, center_x, center_y, children, cls, disabled, height, id, ids, opacity, parent, pos, pos_hint, right, size, size_hint, size_hint_x, size_hint_y, top, width, x, y |

## 12 Module isySUR.gui.triangulation

Simple triangulation class. It tries to triangulate a given polygon using the ear clipping algorithm. Roughly based on Rawlyn's implementation (<http://chipmunk-physics.net/forum/viewtopic.php?f=> but not using pymunk and more flexible to the polygon orientation.

### 12.1 Variables

| Name                     | Description        |
|--------------------------|--------------------|
| <code>--package--</code> | <b>Value:</b> None |

### 12.2 Class Triangulator

A simple triangulator. Takes a polygon outline with no self intersection or holes and computes a triangulation using ear clipping.

#### 12.2.1 Methods

|  |
|--|
| <b><code>--init--(self)</code></b>   |
| Constructor for the triangulator. Initialises the clockwise variable, used to store if the polygon points are ordered clockwise or counter-clockwise |
| <b><code>calc_area(self, tri)</code></b>   |
| Function to compute the given triangle.  |
| <b>Parameters</b>  |
| <b>tri</b> : The triangle which area is to be computed<br>( <i>type=List[a,b,c]</i> )  |
| <b>Return Value</b>  |
| Area of the triangle, if there were 3 points given in tri. None otherwise<br>( <i>type=Float</i> )   |

**is\_clockwise**(*self*, *points*)

Function to compute if the orientation of a pointlist is clockwise.

**Parameters**

**points:** The pointlist that is to be checked.

(*type*=[*Float*,*Float*],)

**Return Value**

True if the points are orientated clockwise, false if they are orientated counter-clockwise.

(*type*=*Boolean*)

**triangulate**(*self*, *poly*)

Main function performing the triangulation of the given polygon. Does not work for self intersecting polygons!

**Parameters**

**poly:** Pointlist making up the polygon. Points can be sorted either clockwise or counter-clockwise.

(*type*=[*Tupel*(*Float*,*Float*),])

**Return Value**

List of triangles covering the polygon.

(*type*=[*Tupel*(*Float*,*Float*), *Tupel*(*Float*,*Float*), *Tupel*(*Float*,*Float*)], )

## 13 Module isySUR.isyUtils

Module containing utility functions. We provide a function to convert a point in latitude, longitude to equidistant X,Y coordinates given a relative null point.

### 13.1 Functions

**getXYpos**(*relativeNullPoint*, *p*)

Calculates X and Y distances in meters.

**Parameters**

**relativeNullPoint:** The relative null point for the calculation.

(*type=Tupel(float,float)*)

**p:** Point (lat,long) for which the x,y position should be calculated.

(*type=Tupel(float,float)*)

**Return Value**

Tupel with x,y coordinates of the given point.

(*type=Tupel(float,float)*)

### 13.2 Variables

| Name        | Description            |
|-------------|------------------------|
| --package-- | <b>Value:</b> 'isySUR' |

## 14 Module isySUR.kmlData

Module containing the KMLObject and Placemark. These classes hold all the required information for creating and parsing a kml-xml.

### 14.1 Functions

**indent**(*elem*, *level*=0)

Recursive function used to indent xml elements according to their level to allow pretty print.

**Parameters**

**elem:** The element to be indented

(*type*=*ET.Element*)

**level:** Optional parameter representing the current level in the tree of the element

(*type*=*Int*)

### 14.2 Variables

| Name                     | Description            |
|--------------------------|------------------------|
| <code>--package--</code> | <b>Value:</b> 'isySUR' |

### 14.3 Class KMLObject

Class representing a kml file. Holds a list of contained placemarks.



## 14.3.1 Methods

---

**\_\_init\_\_**(*self*, *name*, *placemarks*=None)

---

Constructor for the KMLObject.

**Parameters**

**name:** Name of the kml.

(*type*=*String*)

**placemarks:** Optional paramter to initialise this KMLObject with a list of placemarks.

(*type*=[*kmlData.Placemark*,])

---



---

**getStyle**(*self*, *styleName*)

---

Function to get the style with the given name of this kmlObject. If the kml does not have a style of the given name, a default style (white) is returned.

**Parameters**

**styleName:** Name of the style to be returned.

(*type*=*String*)

**Return Value**

A dictionary containing the polygon Colour, the lineColour and the lineWidth of the requested style, or of the default style if there is no style of the given name.

(*type*={"polyColour": *String*, "lineColour": *String*, "lineWidth": *String*})

---



---

**addStyles**(*self*, *styles*)

---

Function that allows to add styles to the kml. If styles does not include lineColour, or lineWidth, standard values are used.

**Parameters**

**styles:** The styles that are to be added.

(*type*={"styleID": {"polyColour": *value*, "lineColour": *value*, "lineWidth": *value*},})

---

**addPlacemark**(*self*, *placemark*)

Function to add a placemark to this SURObject.

**Parameters**

**placemark:** The placemark object that is to be added.

**Raises**

**TypeError** If the given placemark is not a Placemark object.

**addPlacemarkList**(*self*, *placemarkList*)

Function to add a list of placemarks to this SURObject.

**Parameters**

**placemarkList:** The list of placemark objects that are to be added.

**Raises**

**TypeError** If the placemarkList is not actually a list.

**parseKML**(*cls*, *filename*)

Classmethod to create a KMLObject from a file.

**Parameters**

**filename:** The name (including the path) of the file.  
(*type=String*)

**Return Value**

The parsed KMLObject.

**saveAsXML**(*self*, *filename*)

Function to save the kml in it's xml representation in a file with the given filename.

**Parameters**

**filename:** The name of the file this kml should be written to.  
(*type=String*)

**getXML**(*self*)

Function to return the XML representation for this kml as string.

**Return Value**

The String-XML representation of this kml object.  
(*type=str*)

## 14.4 Class Placemark

### 14.4.1 Methods

```
__init__(self, name, imageName, ruleType=None, pointList=None,
style='#defaultStyle', ruleCoords=None)
```

Constructor for the Placemark class.

Contains a list of nodes that make up the polygon for this placemark.

#### Parameters

**name:** The name of the placemark.  
(*type=String*)

**imageName:** The name/src of the image in the placemark description.  
(*type=String*)

**ruleType:** The rule type of the placemark. (Currently not used)  
(*type=Tupel(key, value)*)

**pointList:** Optional pointList that contains the points coordinates (lon,lat) that make up the polygon this placemark describes.

**style:** Optional style for the placemark. Relevant for displaying the placemark in googleEarth. (Currently not used)  
(*type=String.*)

**ruleCoords:** Optional rule coordinates (lat,lon).  
(*type=(Float,Float)*)

```
addPoint(self, point)
```

Function to add a node to the polygon for the placemark.

#### Parameters

**node:** The point coordinate (lon,lat) that is to be added to the placemark.

#### Raises

**TypeError** If point is not a string.

**addPointList**(*self*, *pointList*)

Function to add a list of nodes to the polygon of the placemark.

**Parameters**

**pointList:** The list of point coordinates(lon,lat) that are to be added.

**Raises**

**TypeError** If pointList is not a list.

**hasPolygon**(*self*)

Function to check if a placemark contains a valid polygon.

A polygon is considered as valid as soon as it contains at least 3 nodes.

**Return Value**

True if the polygon consists of at least 3 nodes, else False.

**getXMLTree**(*self*)

Function to get the xmlTree representation of the placemark.

**Return Value**

A xmlTree (xml.etree) representation of the placemark.

## 15 Module isySUR.osmAPI

Module containing the *osmAPI* class, used to perform requests to the OpenStreetMap API and parse the returned xml data to *osmData*.

### 15.1 Variables

| Name                     | Description                         |
|--------------------------|-------------------------------------|
| <code>__package__</code> | <b>Value:</b> <code>'isySUR'</code> |

### 15.2 Class *osmAPI*

#### 15.2.1 Methods

|  |
|--|
| <b><code>__init__</code></b> ( <i>self</i> )   |
| Constructor of the <i>osmAPI</i> making a connection to Openstreetmap.                             |
| <b><code>getDataFromPoly</code></b> ( <i>self</i> , <i>polyString</i> )                            |
| Function to request parsed data from osm that is within the polygon given by the <i>polyString</i> |
| <b>Parameters</b>  |
| <i>polyString</i> : String containing the outline of the polygon "lat1 lon1<br>lat2 lon2 ..."      |
| ( <i>type</i> ="String")   |
| <b>Return Value</b>  |
| The parsed <i>osmData</i>  |
| ( <i>type</i> = <i>osmData.OSM</i> )   |

**performRequest**(*self*, *boundingBox*, *filterList*=[])

This function requests data from openStreetMap

**Parameters**

**boundingBox:** A list of the points of the boundingBox  
[minLat,minLon,maxLat,maxLon].

(*type*=[*float,float,float,flaot*])

**filterList:** (optional) List of tuple of filter-rules  
e.g. [('way',["amenity"="univerity",..]),..] or  
('way',["building"=""]) for some kind of wild-card

(*type*=[*Tupel(str,[str,..])*])

**Return Value**

An request object with the data-xml in the content property.

## 16 Module isySUR.osmData

Module containing the osm-data classes OSM, Node, Way and Relation. Furthermore provides query functionality for closest elements.

### 16.1 Variables

| Name                     | Description            |
|--------------------------|------------------------|
| <code>__package__</code> | <b>Value:</b> 'isySUR' |

### 16.2 Class OSM

#### 16.2.1 Methods

|  |
|--|
| <b><code>__init__(self)</code></b>   |
| <p>Constructor for the osm data object.</p> <p>Initialises the dictionaries for the nodes, ways and relations that will be contained in this osmObject.</p>  |
| <b><code>addNode(self, node)</code></b>  |
| <p>Function to add a node to this osm object.</p> <p><b>Parameters</b></p> <p>    <b>relation:</b> The node object that is to be added.</p> <p><b>Raises</b></p> <p>    <b>TypeError</b> TypeError is raised when something other than a node is passed.</p> |
| <b><code>addNodeList(self, nodeList)</code></b>  |
| <p>Function to add a list of nodes to this osm object.</p> <p><b>Parameters</b></p> <p>    <b>nodeList:</b> The list of node objects that are to be added.</p>   |

---

**addWay**(*self*, *way*)

---

Function to add a way to this osm object.

**Parameters**

**relation:** The way object that is to be added.

**Raises**

**TypeError** TypeError is raised when something other than a way is passed.

---

**addRelation**(*self*, *relation*)

---

Function to add a relation to this osm object.

**Parameters**

**relation:** The relation object that is to be added.

**Raises**

**TypeError** TypeError is raised when something other than a relation is passed.

---

**\_\_eq\_\_**(*self*, *other*)

---

Override of the equal method for OSM.

Equality is based on the equality of the three dictionaries nodes, ways and relations

**Parameters**

**other:** The other osm object that this object is to be compared with.

**Return Value**

True if the other object is equal to this object, else False.

(*type=Boolean*)

---

**\_\_ne\_\_**(*self*, *other*)

---

Override of the not equal method for OSM.

**Parameters**

**other:** The osm object that this object is to be compared with.

**Return Value**

True if other is not equal to this object, else False.

(*type=Boolean*)



```
getNearestNode(self, point, tags={}, otherNodes=[])
```

This function returns the ids of the nodes and its distance which are closest to the

@param point: The point - (lat, lon) - for which the function has  
to compute the closest node.

@type point: Tuple(float,float)

@param tags: A dictionary of tags, given as a key value pair, which  
will be used to filter the nodes. You can use \* as wildcard  
for the value or key but NOT both.

e.g. dict("type":"xyz") or dict("type": "\*")

@type tags: dict(str:str)

@param otherNodes: Use only this nodes, given by a list of  
its IDs, to find the nearest relation.

@type otherNodes: [str,]

@return: The function returns a list distanceResult-Objects (e.g [distObj1,distObj2,  
which holds the following informations:

- distance (float): If an object is found, it contains the  
distance to the nearest object
- nearestObj (str, type): it contains the ID and the type  
of the nearest object

For example:

found object: ("1", osmData.Node)

- nearestSubObj [(str, type)]: Is empty: [("-1",None)]

If nothing is found, the resulting list is empty.

@rtype: [osmData.distanceResult,...]

```
getNearestWay(self, point, onlyPolygons, tags={}, otherWays=[])
```

This function returns the ids of the ways, the distance which is closest to the given point.

@param point: The point - (lat, lon) - for which the function has to compute the closest way.

@type point: Tuple(float,float)

@param onlyPolygons: True for only using Ways with complete Polygons for computation  
False for use all

@type onlyPolygons: boolean

@param tags: A dictionary of tags, given as a key value pair, which will be used to filter the ways. You can use \* as wildcard for the value or key but NOT both.

e.g. dict("type":"xyz") or dict("type": "\*")

@type tags: dict(str:str)

@param otherWays: Use only these ways, given by a list of its IDs, to find the nearest way.

@type otherWays: [str,]

@return: The function returns a list of distanceResult-Objects (e.g. [distObj1,distObj2,...]) which holds the following informations:

- distance (float): If an object is found, it contains the distance to the nearest object
- nearestObj [(str, type)]: If one object is found, it contains the ID and the type of the nearest object

For example:

found object: ("1", osmData.Way)

- nearestSubObj [(str, type)]: If an object is found, it contains the IDs of the two Nodes, which defines the nearest Edge. There could be several edges, which have the same distance

For example:

found object: ([("1","2"], osmData.Node),...]

If nothing is found, the resulting list is empty.

@rtype: [osmData.distanceResult,...]

```
getNearestRelation(self, point, tags={}, otherRelations=[])
```

This function returns the ids of the relation, its way and its distance which is closest

@param point: The point - (lat, lon) - for which the function has to compute the closest relation.

@type point: Tuple(float, float)

@param tags: A dictionary of tags, given as a key value pair, which will be used to filter the relations. You can use \* as wildcard for the value or key but NOT both.

e.g. dict("type": "multipolygon") or dict("type": "\*")

@type tags: dict(str: str)

@param otherRelations: Use only these relations, given by a list of their IDs, to find the nearest relation.

@type otherRelations: [str,]

@return: The function returns a list of distanceResult-Object (e.g. [distObj1, distObj2]) which holds the following information:

- distance (float): If an object is found, it contains the distance to the nearest object
- nearestObj (str, type): If one object is found, it contains the ID and the type of the nearest object

For example:

found object: ("1", osmData.Relation)

- nearestSubObj [(str, type)]: If an object is found, it contains the ID and the type of the nearest subobject in the relation.

For example:

found object: [("1", osmData.Relation), ...]

If nothing is found, the resulting list is empty.

@rtype: [osmData.distanceResult, ...]

## 16.3 Class Node



### 16.3.1 Methods

|   |
|---|
| <b><code>__init__(self, identifier, lat, lon, tags)</code></b>                        |
| Basic class containing an osm Node  |
| <b>Parameters</b>   |
| <b>identifier:</b> The id of the node.<br><i>(type=Will be parsed to string)</i>      |
| <b>lat:</b> Latitude of the node as float.<br><i>(type=Will be parsed to float.)</i>  |
| <b>lon:</b> Longitude of the node as float.<br><i>(type=Will be parsed to float.)</i> |
| <b>tags:</b> A dictionary containing all the tags for the node.                       |
| Overrides: object.__init__  |

|   |
|---|
| <b><code>getCoordinateString(self)</code></b>                     |
| Returns a string representation of the coordinates for this node. |
| <b>Return Value</b>   |
| A String with lon, lat. Both with 8 trailing digits               |

|   |
|---|
| <b><code>__eq__(self, other)</code></b>   |
| Override of the equality method for node.   |
| Equality is based on the equality of the id, longitude, latitude and the tags.  |
| <b>Parameters</b>   |
| <b>other:</b> The node this node is to be compared with.  |
| <b>Return Value</b>   |
| True if the other node is equal to this node with respect to the above mentioned fields, else False.<br><i>(type=Boolean)</i> |

---

**`--ne--(self, other)`**


---

Override of the not equal method for node.

**Parameters**

**other**: The node that this node is to be compared with.

**Return Value**

True if other is not equal to this node, else False.

(*type=Boolean*)

---

**`getDistance(self, point)`**


---

This function computes the distance between two points

@param point: the point the distance should be computed with

@type point: tuple of latitude and longitude (float,float)

@return: The function returns a distanceResult-Object which holds the following informations:

- distance (float): Distance between the current and the given point

- nearestObj (str, type): The current node

For example: ("1", osmData.Node)

- nearestSubObj [(str, type)]: is empty: [("-1", None)]

@rtype: osmData.distanceResult

***Inherited from object***

`--delattr--()`, `--format--()`, `--getattr--()`, `--hash--()`, `--new--()`, `--reduce--()`, `--reduce_ex--()`, `--repr--()`, `--setattr--()`, `--sizeof--()`, `--str--()`, `--subclasshook--()`

**16.3.2 Properties**

| Name                         | Description  |
|------------------------------|--|
| coords                       | This function-property returns latitude and longitude as tuple<br>( <i>type=Tupel(float,float)</i> ) |
| <i>Inherited from object</i> |  |
| <code>--class--</code>       |  |

## 16.4 Class Way



### 16.4.1 Methods

**`__init__(self, identifier, refs, tags, osmObj)`**

Basic class containing an osm Way.

**Parameters**

- identifier:** The id of the way as a string
- refs:** An ordered list of node id's that make up the way  
(*type=[str,..]*)
- tags:** A dictionary containing all the tags for the way  
(*type=dict(str:str,..)*)
- osmObj:** Reference to the osmObj, this way is included in.  
(*type=osmData.OSM*)

Overrides: object.\_\_init\_\_

**`isPolygon(self)`**

This functions proves if the Way is a polygon

**Return Value**

- true if polygon exists  
(*type=boolean*)

**`__eq__(self, other)`**

Override of the equality method for way.

Equality is based on the equality of the id, the references and the tags.

**Parameters**

- other:** The relation this relation is to be compared with.

**Return Value**

- True if the other way is equal to this way in id, references and tags, else False.  
(*type=Boolean*)

---

**`--ne--(self, other)`**

Override of the not equal method for way.

**Parameters**

**other:** The way that this way is to be compared with.

**Return Value**

True if other is not equal to this way, else False.

(*type=Boolean*)

---

**`isInside(self, point, vertices=[])`**

This function proves if a points is envolved in a polygone

**Parameters**

**point:** x and y-coord of the point

(*type=Tupel(float,float)*)

**vertices:** list of points to calculate with (e.g used for combined polygons)

(*type=[Tupel(float,float),..]*)

**Return Value**

true if point is inside false if point is outside or on edge or way isn't a polygon

(*type=boolean*)

```
getDistance(self, point)
```

Function that returns the distance of the given point to the current way.

@param point: The point(lat,lon) to which the distance is calculated

@type point: Tuple(float,float)

@return: The function returns a distanceResult-Object which holds the following informations:

- distance (float): The distance between the current way and the given point

- nearestObj [(str, type)]: The current way

For example: [("1", osmData.Way)]

- nearestSubObj [(str, type)]: The edge from the current way which is closest

For example: [("1", "2"], osmData.Node)]

@rtype: osmData.distanceResult

### *Inherited from object*

```
__delattr__(), __format__(), __getattr__(), __hash__(), __new__(), __reduce__(), __reduce_ex__(),
__repr__(), __setattr__(), __sizeof__(), __str__(), __subclasshook__()
```

#### 16.4.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| __class__                    |             |

## 16.5 Class Relation





## 16.5.1 Methods

---

**`__init__(self, identifier, members, tags, osmObj)`**


---

Basic class containing an osm Relation.

**Parameters**

**identifier:** The id of the relation.

*(type=any type)*

**members:** The members of this relation.

*(type=A list of tripel [membertype(e.g. way), id of the member, addition tags (e.g. outer)])*

**tags:** A dictionary containing all the tags for the relation

*(type={key: value,})*

**osmObj:** Reference to the osmObj, this way is included in.

*(type=osmData.OSM)*

Overrides: object.\_\_init\_\_

---

**`getDistance(self, point)`**


---

Function that returns the distance of the given point to the current relation.

@param point: The point(lat,lon) to which the distance is calculated

@type point: Tuple(float,float)

@return: The function returns a distanceResult-Object which holds the following informations:

- distance (float): Distance between the current and the given point

- nearestObj (str, type): The current relation

For example: ("1", osmData.Relation)

- nearestSubObj [(str, type)]: The nearestSubObject of the current relation

For example: [("3", osmData.Way),...]

@rtype: osmData.distanceResult

**isInside**(*self*, *point*)

This function proves, if a point is inside a relation.

**Parameters**

**point**: the point to prove @type point; Tuple(float,float)

**Return Value**

the result e.g. (True,([1],osmData.Way)) or  
(True,([1,2,5],osmData.Way)) for polygon combined of more then  
one way

(*type*=*Tupel*(*boolean*,*Tupel*([*str/int,..*],*osmData.Types*)))

**addPolygon**(*self*, *wayList*)

Function to add a polygon to the relation.

**Parameters**

**wayList**: List of way ids that make up the polygon

(*type*=*A list of ids. The id's can be of any type but must  
match the type of the actual objects.*)

**addPolygonList**(*self*, *polyList*)

Function to add a list of polygons to the relation.

**Parameters**

**polyList**: List of polygons. A polygon is given by a list of way Ids  
that make up the polygon.

(*type*=*A list of lists that contain way Ids.*)

**hasMember**(*self*, *memId*)

Function to query if the given member is present in the relation

**Parameters**

**memId**: The member id that is to be tested.

(*type*=*Any type*)

**Return Value**

True if this relation has got a member of the given id, else False

(*type*=*Boolean*)

---

**`--eq--(self, other)`**


---

Override of the equality method for relations.

Equality is based on the equality of the id, the members and the tags.

**Parameters**

**other**: The relation this relation is to be compared with.

**Return Value**

True if the other relation is equal to this relation in id, members and tags, else False.

(*type=Boolean*)

---

**`--ne--(self, other)`**


---

Override of the not equal method for relations.

**Parameters**

**other**: The relation that this relation is to be compared with.

**Return Value**

True if other is not equal to this relation, else False.

(*type=Boolean*)

***Inherited from object***

`--delattr--()`, `--format--()`, `--getattr--()`, `--hash--()`, `--new--()`, `--reduce--()`, `--reduce_ex--()`,  
`--repr--()`, `--setattr--()`, `--sizeof--()`, `--str--()`, `--subclasshook--()`

### 16.5.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| <code>--class--</code>       |             |

## 16.6 Class `distanceResult`



### 16.6.1 Methods

**`__init__(self, distance, nearestObj, nearestSubObj=[('1', None)])`**

Basic class containing the result of a distance calculation

**Parameters**

**distance:** The distance to the nearestObj  
(*type=**float*)

**nearestObj:** the ID and type of the nearest object e.g.  
("1",osmData.Relation)  
(*type=**Tuple(str,type)*)

**nearestSubObj:** (optional) the nearest subobject of the current  
nearest object (a way which is a subobject of a  
relation) e.g. [("2",osmData.Way),...]  
(*type=**[Tuple(str,str)]*)

Overrides: `object.__init__`

#### *Inherited from object*

`__delattr__()`, `__format__()`, `__getattr__()`, `__hash__()`, `__new__()`, `__reduce__()`, `__reduce_ex__()`,  
`__repr__()`, `__setattr__()`, `__sizeof__()`, `__str__()`, `__subclasshook__()`

### 16.6.2 Properties

| Name                         | Description |
|------------------------------|-------------|
| <i>Inherited from object</i> |             |
| <code>__class__</code>       |             |

## 17 Module isySUR.program

Module containing the KMLCalculator, the main class handling the calculation of kmIs based on SUR files.

### 17.1 Variables

| Name                     | Description            |
|--------------------------|------------------------|
| <code>__package__</code> | <b>Value:</b> 'isySUR' |

### 17.2 Class KMLCalculator

#### 17.2.1 Methods

|  |  |
|--|--|
| <b><code>__init__(self)</code></b>   |  |
| Constructor for the pipeline. Sets up the osmAPI as well as the desired bounding box, that is to be used to request osm data.            |  |
| <b><code>computeKMLsAndStore(self, inPath, outPath, configPath='')</code></b>  |  |
| Function to compute kmIs from a given file of SURs. Stores them either in one kml or in individual kmIs plus one containing all of them. |  |
| <b>Parameters</b>  |  |
| <b>inPath:</b>   | Path to the file containing the SURs which areas are to be computed.<br>( <i>type=String</i> )   |
| <b>outPath:</b>  | Path to the file or directory where the results should be saved. If outPath points to a file, all placemarks are stored in one kml. If outPath points to a directory, one kml for each SUR will be computed plus one, containing all others.<br>( <i>type=String</i> ) |
| <b>configPath:</b>   | Optional path to a config file, containing information about the classification of rules (indoor, outdoor or both).<br>( <i>type=String</i> )  |

**calcKML**(*self*, *surObj*)

Function to work on a single sur.SUR object and computes it's kml.

**Parameters**

**surObj**: The sur object whose kml is to be calculated.  
(*type=sur.SUR*)

**Return Value**

KML object containing the calculated area for the given sur.  
Returns None if no polygon could be computed.  
(*type=kmlData.KMLObject*)

## 18 Module isySUR.sur

Basic class to load and store space usage rules.

### 18.1 Variables

| Name                     | Description            |
|--------------------------|------------------------|
| <code>--package--</code> | <b>Value:</b> 'isySUR' |

### 18.2 Class SUR

#### 18.2.1 Methods

|   |   |
|---|---|
| <b><code>--init--(self, surID, name, lat, lon, surClassification='IO')</code></b> |   |
| Constructor for the space usage rule object.                                      |   |
| <b>Parameters</b>   |   |
| <b>surID:</b>   | Id of the sur   |
| <b>name:</b>  | The name of the rule. Usually a key-value combination.<br>( <i>type=String</i> )  |
| <b>lat:</b>   | The latitude that belongs to the SUR.<br>( <i>type=Float</i> )  |
| <b>lon:</b>   | The longitude that belongs to the SUR.<br>( <i>type=Float</i> )   |
| <b>surClassification:</b>   | Optional parameter to determine whether this sur can be applied indoor ("I"), Outdoor ("O") or indoor as well as outdoor ("IO"). Default is "IO".<br>( <i>type=String</i> ) |
| <b><code>addRuleName(self, name)</code></b>                                       |   |
| Function to add further rule names to the SUR.                                    |   |
| <b>Parameters</b>   |   |
| <b>name:</b>  | The name for the rule that is to be added.<br>( <i>type=String</i> )  |

**fromString**(*cls, s*)

Classmethod that creates a SUR object from the given string.

**Parameters**

**s:** The string that contains the relevant data. The data should be separated by ','  
(*type=String*)

**Return Value**

The created SUR object.  
(*type=sur.SUR*)

**fromFile**(*cls, f, configPath*)

Classmethod that creates a list of SUR objects from the given file.

**Parameters**

**f:** The file handler of the already opened file that contains the SUR data.  
(*type=file*)

**configPath:** Path to the config file that should be used to determine sur classification.  
(*type=String*)

**Return Value**

A list of all the created SURs.  
(*type=[sur.SUR,]*)



## 19 Module isySUR.surTypeManager

Helper class that reads known sur types (indoor, outdoor, both) from a file and can be queried for a certain rule.

### 19.1 Variables

| Name                     | Description        |
|--------------------------|--------------------|
| <code>__package__</code> | <b>Value:</b> None |

### 19.2 Class *surTypeManager*

#### 19.2.1 Methods

|  |
|--|
| <b><code>__init__(self, configPath)</code></b><br><hr/> Constructor for the type manager. Parses the given config file.<br><b>Parameters</b><br><b>configPath:</b> Path to the config file that is to be used.<br>( <i>type=String</i> )   |
| <b><code>getSURType(self, ruleString)</code></b><br><hr/> Function to query the surType for a given rule. Returns the classification ("I", "O", "IO") of the sur. If the given ruleString was not found in the config IO is returned.<br><b>Parameters</b><br><b>ruleString:</b> String of the rule name, e.g. "animal_feeding="no".<br>( <i>type=String</i> )<br><b>Return Value</b><br>Sur classification ("I", "O", "IO")<br>( <i>type=String</i> ) |

## 20 Module *run\_isySUR*

Main entrance point for the informatiCup program.

### 20.1 Functions

#### **parseArguments()**

Function that takes program parameters and checks for required arguments.

#### **gui(*args*=None)**

Function that starts the gui version of the program. When importing fails, a message is printed and `dealWithImportError` is called.

##### **Parameters**

**args:** the arguments to give to the gui version. @type  
argparse.Namespace

#### **dealWithImportError()**

Function that gives a prompt to get the parameters for the cli version without `sys.argv`.

#### **cli(*args*)**

Function that starts the command line version of the program.

##### **Parameters**

**args:** the arguments to give to the cli version. @type  
argparse.Namespace

### 20.2 Variables

| Name                     | Description        |
|--------------------------|--------------------|
| <code>__package__</code> | <b>Value:</b> None |

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