
scikit-surgeryutils Documentation

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CHAPTER 1

Features

- [Common overlay apps](#) - Examples of common uses of scikit-surgeryvtk's `VTKOverlayWindow`. Includes overlaying on a video feed, duplicating a feed.

Command Line Apps

- `sksurgeryvideolag.py` - shows a millisecond timer and video image to crudely measure measure lag.
- `sksurgerycharucotest.py` - extracts charuco points and annotates video image with each id detected.
- `sksurgeryrendermodelslikecamera.py` - renders a VTK model, over background image, using OpenCV camera intrinsics.
- `sksurgerymakecalibrationdots.py` - Create a calibraton dot pattern.
- `sksurgeryreslice.py` - DICOM reslice widget demo.
- `sksurgerytextoverlay.py` - VTK text overlay demo.
- `sksurgerytransformpolydata.py` - Read a surface mesh (.vtk,.vtp,.stl,.ply file), transform by 4x4 matrix and write as .vtk.

Source code is avaiialble on [GitHub](#).

2.1 scikit-surgeryutils



scikit-surgeryutils is part of the [SNAPPY](#) software project, developed at the [Wellcome EPSRC Centre for Interventional and Surgical Sciences](#), part of [University College London \(UCL\)](#).

scikit-surgeryutils containing small demo apps and utilities.

2.1.1 Features

- [Common overlay apps](#) - Examples of common uses of scikit-surgeryvtk's `VTKOverlayWindow`. Includes overlaying on a video feed, duplicating a feed.

2.1.2 Command Line Apps

- `sksurgeryvideolag.py` - shows a millisecond timer and video image to crudely measure measure lag.
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- `sksurgeryreslice.py` - DICOM reslice widget demo.
- `sksurgerytextoverlay.py` - VTK text overlay demo.
- `sksurgerytransformpolydata.py` - Read a surface mesh (`.vtk`, `.vtp`, `.stl`, `.ply` file), transform by 4x4 matrix and write as `.vtk`.

2.1.3 Installing

You can pip install directly from the repository as follows:

```
pip install git+https://github.com/UCL/scikit-surgeryutils
```

2.1.4 Developing

Cloning

You can clone the repository using the following command:

```
git clone https://github.com/UCL/scikit-surgeryutils
```

Running the tests

You can run the unit tests by installing and running tox:

```
pip install tox
tox
```


Encountering Problems?

Please check list of [common issues](#).

Contributing

Please see the [contributing guidelines](#).

Useful links

- [Source code repository](#)
- [Documentation](#)

2.1.5 Licensing and copyright

Copyright 2018 University College London. scikit-surgeryutils is released under the BSD-3 license. Please see the [license file](#) for details.

2.1.6 Acknowledgements

Supported by [Wellcome](#) and [EPSRC](#).

2.2 Common Overlay Apps [Temp Change]

Common use cases for `vtk_overlay_window`

```
class sksurgeryutils.common_overlay_apps.DuplicateOverlayWindow
    Bases: sksurgeryutils.common_overlay_apps.OverlayOnVideoFeedCropRecord
    Set the background of vtk_overlay_window to duplicate that of another vtk_overlay_window.
    Example usage: video_source = 0 source_window = OverlayOnVideoFeedCropRecord(video_source)
    duplicate_window = DuplicateOverlayWindow() duplicate_window.set_source_window(source_window)
on_record_start ()
    Don't want to call the base class version, so override.
on_record_stop ()
    Don't want to call the base class version, so override.
set_roi ()
    Don't want to call the base class version, so override.
set_source_window (source_window)
    Set the source window. :param source_window: The window that contains the image to copy.
update ()
    Update the frame with a new background image.
```

class `sksurgeryutils.common_overlay_apps.OverlayBaseApp` (*video_source*,
dims=None)

Bases: object

Base class for applications that use `vtk_overlay_window`. The `update()` method should be implemented in the child class.

Parameters `video_source` – OpenCV compatible video source (int or filename)

add_vtk_models_from_dir (*directory*)

Add VTK models to the foreground. :param: directory, location of models

start ()

Show the overlay widget and set a timer running

stop ()

Make sure that the VTK Interactor terminates nicely, otherwise it can throw some error messages, depending on the usage.

update ()

Update the scene background and/or foreground. Should be implemented by sub class

class `sksurgeryutils.common_overlay_apps.OverlayOnVideoFeed` (*video_source*,
dims=None)

Bases: `sksurgeryutils.common_overlay_apps.OverlayBaseApp`

Uses the acquired video feed as the background image, with no additional processing.

update ()

Get the next frame of input and display it.

class `sksurgeryutils.common_overlay_apps.OverlayOnVideoFeedCropRecord` (*video_source*,
output_filename=None,
dims=None)

Bases: `sksurgeryutils.common_overlay_apps.OverlayBaseApp`

Add cropping of the incoming video feed, and the ability to record the `vtk_overlay_window`.

Parameters

- **video_source** – OpenCV compatible video source (int or filename)
- **output_filename** – Location of output video file when recording. If none specified, the current date/time is used as the filename.

get_output_frame ()

Get the output frame to write in numpy format.

on_record_start ()

Start recording data on each frame update. It is expected that this will be triggered using a Qt signal e.g. from a button click. (see `sksurgerydavinci.ui.Viewers` for examples)

on_record_stop ()

Stop recording data.

set_roi ()

Crop the incoming video stream using `ImageCropper`.

update ()

Get the next frame of input, crop and/or write to file (if either enabled).

2.3 Misc Utilities

Various image utilities that might be useful in this package.

`skimageutils.utils.image_utils.image_to_pixmap(rgb_image)`

Converts an OpenCV image to a Qt pixmap.

Parameters `rgb_image` – OpenCV image, 3 channel, RGB.

Returns QPixmap

Any useful utilities relating to displays/screens.

class `skimageutils.utils.screen_utils.ScreenController`

Bases: object

This class detects the connected screens/monitors, and returns the primary screen and a list of any secondary screens.

list_of_screens()

Return the primary screen and list of other available screens

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