

A3DP GUI Toolkit

0.5

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Chapter 1

A3DP GUI Toolkit

1.1 Introduction

This directory contains a collection of Graphical User Interfaces (GUIs) based on the QGIS plugin platform. The GUIs are dialog-based user interfaces designed in Qt-5. The QGIS plugins platform supports the Python programming language, and as a result the A3DP GUI Toolkit is written in Python 3.7.

1.2 How Does It Work?

The Python-based QGIS plugins are designed as wrappers for the C++ software modules for SMOCT. The QGIS plugins accept user input through the GUI dialogs, then pass on these input parameters to the C++ command line.

1.3 Requirements

The following pre-requisites must be satisfied to install and use the plugins.

- [QGIS](#) version 3.14 or newer
 - Version 3.16 long-term release is preferred for stability

To build documentation (optional), the following additional software are required.

- [Doxygen](#) v 1.8.18 or newer
- [doxypy](#) v 0.8.8 or newer
- [LaTeX](#) (optional) to create a PDF document

1.4 Installation

The plugins are installed in three steps:

1. Install QGIS
2. Deploy/Install plugins
3. Activate/Enable plugins in QGIS

Please follow the instructions provided in the [\[user manual\]\[1\]](#) to install the plugins.

1.5 Post-Installation

The installation will create menu items in QGIS, named `Image Registration` and `ATDR`. These will have sub-menu items corresponding to the different software modules delivered under `SMACT`.

To use these plugins, the location of the C++ software executables (*.exe) must be specified to the plugins. To specify the location, first launch the `Image Registration > Settings Configuration` plugin, then click the button [...] and select the folder (called `qgis-exes`).

The C++ software can be located anywhere on the same computer. If using the installer, `setup.cmd` version 0.3 or newer, the software will typically be placed at `C:\OSGeo4W64\smact`. In older versions, the installer will *NOT* copy the downloaded C++ software. In either case, users can manually copy all the EXE and DLL files to any folder on the computer, and select that folder from the `Image Registration > Settings Configuration` plugin dialog.

1.6 References

[1]: AUG Signals, "SMACT UI Installation Manual.pdf", August 2021

Chapter 2

Namespace Index

2.1 Packages

Here are the packages with brief descriptions (if available):

classifier_tester.classifier_tester	??
classifier_trainer.classifier_trainer	??
contour_detection.contour_detection	??
edge_detection.edge_detection	??
feat_dataset_generator.feat_dataset_generator	??
fourier_transform.fourier_transform	??
gabor_filter.gabor_filter	??
gcp_mapper.gcp_mapper	??
gcp_mapper.gcp_mapper_base	??
histogram.histogram	??
hu_moment.hu_moment	??
image_fusion.image_fusion	??
image_registration.image_registration	??
lee_sigma_filter.lee_sigma_filter	??
markov_chain_cfar.markov_chain_cfar	??
model_based_cfar.model_based_cfar	??
multi_cfar.multi_cfar	??
multihypothesis.multihypothesis	??
range_doppler.range_doppler	??
refined_lee_filter.refined_lee_filter	??
segmentation.segmentation	??
settings_configuration.settings_configuration	??
speckle_filter.speckle_filter	??
tamura_filter.tamura_filter	??
target_orientation.target_orientation	??
target_segmentation.target_segmentation	??

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

classifier_tester.py	??
classifier_trainer.py	??
contour_detection.py	??
edge_detection.py	??
feat_dataset_generator.py	??
fourier_transform.py	??
gabor_filter.py	??
gcp_mapper.py	??
gcp_mapper_base.py	??
histogram.py	??
hu_moment.py	??
image_fusion.py	??
image_registration.py	??
lee_sigma_filter.py	??
markov_chain_cfar.py	??
model_based_cfar.py	??
multi_cfar.py	??
multihypothesis.py	??
range_doppler.py	??
refined_lee_filter.py	??
segmentation.py	??
settings_configuration.py	??
speckle_filter.py	??
tamura_filter.py	??
target_orientation.py	??
target_segmentation.py	??

Chapter 4

Namespace Documentation

- 4.1 [classifier_tester.classifier_tester Namespace Reference](#)
- 4.2 [classifier_trainer.classifier_trainer Namespace Reference](#)
- 4.3 [contour_detection.contour_detection Namespace Reference](#)
- 4.4 [edge_detection.edge_detection Namespace Reference](#)
- 4.5 [feat_dataset_generator.feat_dataset_generator Namespace Reference](#)
- 4.6 [fourier_transform.fourier_transform Namespace Reference](#)
- 4.7 [gabor_filter.gabor_filter Namespace Reference](#)
- 4.8 [gcp_mapper.gcp_mapper Namespace Reference](#)
- 4.9 [gcp_mapper.gcp_mapper_base Namespace Reference](#)
- 4.10 [histogram.histogram Namespace Reference](#)
- 4.11 [hu_moment.hu_moment Namespace Reference](#)
- 4.12 [image_fusion.image_fusion Namespace Reference](#)
- 4.13 [image_registration.image_registration Namespace Reference](#)
- 4.14 [lee_sigma_filter.lee_sigma_filter Namespace Reference](#)
- 4.15 [markov_chain_cfar.markov_chain_cfar Namespace Reference](#)
- 4.16 [model_based_cfar.model_based_cfar Namespace Reference](#)
- 4.17 [multi_cfar.multi_cfar Namespace Reference](#)
- 4.18 [multihypothesis.multihypothesis Namespace Reference](#)
- 4.19 [range_doppler.range_doppler Namespace Reference](#)
- 4.20 [refined_lee_filter.refined_lee_filter Namespace Reference](#)
- 4.21 [segmentation.segmentation Namespace Reference](#)

Chapter 5

File Documentation

5.1 classifier_tester.py File Reference

Namespaces

- [classifier_tester.classifier_tester](#)

5.2 classifier_trainer.py File Reference

Namespaces

- [classifier_trainer.classifier_trainer](#)

5.3 contour_detection.py File Reference

Namespaces

- [contour_detection.contour_detection](#)

5.4 edge_detection.py File Reference

Namespaces

- [edge_detection.edge_detection](#)

5.5 feat_dataset_generator.py File Reference

Namespaces

- [feat_dataset_generator.feat_dataset_generator](#)

5.6 `fourier_transform.py` File Reference

Namespaces

- [fourier_transform.fourier_transform](#)

5.7 `gabor_filter.py` File Reference

Namespaces

- [gabor_filter.gabor_filter](#)

5.8 `gcp_mapper.py` File Reference

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- [gcp_mapper.gcp_mapper](#)

5.9 `gcp_mapper_base.py` File Reference

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- [gcp_mapper.gcp_mapper_base](#)

5.10 `histogram.py` File Reference

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- [histogram.histogram](#)

5.11 `hu_moment.py` File Reference

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- [hu_moment.hu_moment](#)

5.12 `image_fusion.py` File Reference

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- [image_fusion.image_fusion](#)

5.13 image_registration.py File Reference

Namespaces

- [image_registration.image_registration](#)

5.14 lee_sigma_filter.py File Reference

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- [lee_sigma_filter.lee_sigma_filter](#)

5.15 markov_chain_cfar.py File Reference

Namespaces

- [markov_chain_cfar.markov_chain_cfar](#)

5.16 model_based_cfar.py File Reference

Namespaces

- [model_based_cfar.model_based_cfar](#)

5.17 multi_cfar.py File Reference

Namespaces

- [multi_cfar.multi_cfar](#)

5.18 multihypothesis.py File Reference

Namespaces

- [multihypothesis.multihypothesis](#)

5.19 range_doppler.py File Reference

Namespaces

- [range_doppler.range_doppler](#)

5.20 README.md File Reference

5.21 refined_lee_filter.py File Reference

Namespaces

- [refined_lee_filter.refined_lee_filter](#)

5.22 segmentation.py File Reference

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- [segmentation.segmentation](#)

5.23 settings_configuration.py File Reference

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- [settings_configuration.settings_configuration](#)

5.24 speckle_filter.py File Reference

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- [speckle_filter.speckle_filter](#)

5.25 tamura_filter.py File Reference

Namespaces

- [tamura_filter.tamura_filter](#)

5.26 target_orientation.py File Reference

Namespaces

- [target_orientation.target_orientation](#)

5.27 target_segmentation.py File Reference

Namespaces

- [target_segmentation.target_segmentation](#)