

## Group 6 – Code Listing

### Template Generation

- *TemplateGenerator.py* – used for 2D and 3D template generation and loading.
- *TemplatesDataAccessObject.py* – used for lazy loading of 3D templates.
- *ChimerUtils/chimera\_template\_generator.py* – used for chimera base template generation. Called by *TemplateGenerator.py*.

### Tomogram Generation

- *TomogramGenerator.py* – used for 2D and 3D tomogram generation.
- *Noise.py* – used to add noise to tomogram.
- *naive\_spaced\_randomizer.py* – used for randomly placing templates in tomogram.
- *poisson\_disk.py* – used for randomly placing templates in tomogram – deprecated.

### Analysis

- *TomogramAnalyzer.py* – used to run the entire tomogram analysis flow.
- *CandidateSelector.py* – used for candidate selection based on maximal correlations.
- *PeakDetection.py* – used for candidate selection maximum correlations peak detection – taken from <https://stackoverflow.com/questions/3684484/peak-detection-in-a-2d-array>.
- *FeaturesExtractor.py* – used for maximum correlations features extraction.
- *Labeler.py* – used for ground truth labeling and SVM identification.
- *TiltFinder.py* – used for post identification tilt assignment.
- *TemplateMaxCorrelations.py* – used for aggregated maximum correlations calculation.

### Metrics

- *MetricTester.py* – Test flow metrics calculation. Called by *FlowTest.py*.
- *Metrics.py* – metrics object used by *MetricTester.py*.
- *ResultsMetrics.py* – Alternative test flow metrics calculation. Called by *SvmView.py*.

### Work Flows

- *FlowTest.py* – used for a complete test flow run
- *SvmTrain.py* – used for SVM training – called by *FlowTest.py* or *Main.py*.
- *SvmEval.py* – used for SVM evaluation – called by *FlowTest.py* or *Main.py*.
- *SvmView.py* – used for viewing SVM output – called by *Main.py*.

### User Interface

- *Main.py* – used by shell interface.
- *TemplateFactory.py* – wraps *TemplateGenerator.py*.
- *TomogramFactory.py* – wraps *TomogramGenerator.py*.
- *StringComperableEnum.py* – used by *TemplateFactory.py* and *TomogramFactory.py*.

### General

- *CommonDataTypes.py* – contains different datatypes used by
- *Configuration.py* – used to load configuration file, holds CONFIG object.
- *VisualUtils.py* – used to display 2D and 3D tomograms and analysis intermediate steps.
- *TemplateUtil.py* – template manipulation utilities used both for template and tomogram generation.

### Configuration Files

- *config.txt* – major tool configuration file
- *testing\_2d.config* – 2d configuration file for *FlowTest.py*.
- *testing\_3d.config* – 3d configuration file for *FlowTest.py*.
- *ChimeraUtils/geometric.txt* – geometric 3d chimera based generation configuration
- *ChimeraUtils/pdbs.py* – PDBs 3d chimera based generation configuration