```
multiscale::analysis
              ::Detector
# avgClusterednessDegree
# avgDensity
# image
# outputFilepath
# debugMode
# outputImage
# detectMethodCalled
# detectorSpecificFieldsInitialised
#OUTPUT CLUSTEREDNESS
#OUTPUT DENSITY
# ERR_OUTPUT_WITHOUT
DETECT
# ERR_OUTPUT_FILE
#ERR INVALID IMAGE
#CSV EXTENSION
# IMG_EXTENSION
# XML_EXTENSION
# WIN_OUTPUT_IMAGE
# KEY_ESC
#KEY SAVE
# LABEL ATTRIBUTE
# LABEL_COMMENT
# LABEL_COMMENT_
                    _CONTENTS
# LABEL_EXPERIMENT_TIMEPOINT
_NUMERIC_STATE_VARIABLE
# LABEL_EXPERIMENT_TIMEPOINT
 SPATIAL ENTITY
# LABEL_EXPERIMENT_TIMEPOINT
 NUMERIC_STATE_VARIABLE NAME
# LABEL_EXPERIMENT_TIMEPOINT
_NUMERIC_STATE_VARIABLE_VALUE
# LABEL SPATIAL ENTITY
 PSEUDO 3D
# LABEL_SPATIAL_ENTITY_TYPE
# LABEL SPATIAL ENTITY
CLUSTEREDNESS
# LABEL_SPATIAL_ENTITY
 DENSITY
#LABEL SPATIAL ENTITY AREA
# LABEL_SPATIAL_ENTITY
 PERIMETER
# LABEL_SPATIAL ENTITY
_DISTANCE_FROM_ORIGIN
# LABEL_SPATIAL_ENTITY
 ANGLE
# LABEL_SPATIAL_ENTITY
 SHAPE
#LABEL_SPATIAL ENTITY
 TRIANGLE_MEASURE
# LABEL SPATIAL ENTITY
RECTANGLE MEASURE
# LABEL_SPATIAL_ENTITY
 CIRCLE_MEASURE
# LABEL_SPATIAL_ENTITY
_CENTROID_X
# LABEL_SPATIAL_ENTITY
 CENTROID Y
# LABEL AVG CLUSTEREDNESS
# LABEL_AVG_DENSITY
+ Detector()
+ ~Detector()
+ detect()
+ outputResults()
# initialise()
# initialiseDetectorSpecific
FieldsIfNotSet()
# setDetectorSpecificFields
InitialisationFlag()
# initialiseDetectorSpecific
Fields()
# initialiseImageDependent
Fields()
# initialiseDetectorSpecific
ImageDependentFields()
# initialiseImageOrigin()
# isValidInputImage()
# getDetectorTypeAsString()
# detect()
# detectInDebugMode()
# detectInReleaseMode()
# polygonAngle()
# polygonAngle()
# minAreaRectCentre()
# findGoodPointsForAngle()
# findGoodIntersectionPoints()
# displayResultsInWindow()
# outputResultsToFile()
# outputResultsToImage()
# storeOutputImageOnDisk()
# outputResultsToCsvFile()
# outputResultsToCsvFile()
# outputSpatialEntitiesToCsvFile()
# outputAveragedMeasuresTo
CsvFile()
# outputResultsToXMLFile()
# outputResultsToXMLFile()
# addSpatialEntitiesToPropertyTree()
# addAverageMeasuresToPropertyTree()
# addNumericStateVariableTo
PropertyTree()
# constructPropertyTree()
# addSpatialEntityProperties
ToTree()
# addSpatialEntityTypeToPropertyTree()
# getCollectionOfSpatialEntity
Pseudo3D()
# processImageAndDetect()
# clearPreviousDetectionResults()
# createTrackbars()
# createTrackbarsWindow()
# createDetectorSpecificTrackbars()
# processPressedKeyRequest()
# displayImage()
# printOutputErrorMessage()
                  Δ
  multiscale::analysis
           ::RegionDetector

    alpha

  - blurKernelSize

    morphologicalCloseIterations

  - regionAreaThresh
  - thresholdValue

    regions

  - DETECTOR_TYPE
  TRACKBAR_ALPHA

    TRACKBAR BETA

  - TRACKBAR KERNEL
  - TRACKBAR_MORPH
   TRACKBAR_CANNY
  TRACKBAR_EPSILON
  - TRACKBAR_REGION_AREA
   THRESH
  - TRACKBAR THRESHOLD
  HIERARCHY_NEXT_INDEX
  - HIERARCHY_PREV_INDEX
  - HIERARCHY_FIRST_CHILD
   INDEX
  - HIERARCHY PARENT INDEX
  - USE CANNY L2
  - CONTOUR AREA ORIENTED
  - ALPHA_REAL_MIN
  - ALPHA_REAL
                 MAX
  BETA_REAL_MIN
  BETA_REAL_MAX
  - ALPHA MAX
  - BETA_MAX
  - KERNEL_MAX
  - MORPH_ITER_MAX
  - CANNY_THRESH_MAX

    EPSILON_MAX

  - REGION AREA THRESH_MAX
  THRESHOLD_MAX
   THRESHOLD_CLUSTEREDNESS
  INTENSITY_MAX
  - THRESHOLD_HOLE_AREA

    POLYGON_CLOSED

    DISPLAY_LINE_THICKNESS

  + RegionDetector()
  + ~RegionDetector()
  + getAlpha()
  + getBeta()
  + getBlurKernelSize()
  + getEpsilon()
  + getMorphologicalCloseIterations()
  + getOriginXCoordinate()
  + getOriginYCoordinate()
  + getRegionAreaThresh()
  + getThresholdValue()
  + getRegions()
  + setAlpha()
  + setBeta()
  + setBlurKernelSize()
  + setEpsilon()
  + setMorphologicalCloseIterations()
  + setOriginXCoordinate()
  + setOriginYCoordinate()
  + setRegionAreaThresh()
  + setThresholdValue()

    initialiseDetectorSpecific

  Fields()

    initialiseDetectorSpecific

  ImageDependentFields()

    createDetectorSpecificTrackbars()

  getDetectorTypeAsString()
  processImageAndDetect()
  - changeContrastAndBrightness()
  smoothImage()
  morphologicalClose()
  thresholdImage()
  findRegions()

    computeAverageMeasures()

    computeAverageClusteredness

  Degree()

    sumOfAverageCentroidDistances()

    computeAverageDensity()

  findPolygonsInImage()
  - createPolygons()
  - createPolygon()
  - setPolygonOuterContour()
  setPolygonInnerContours()
  - approximatePolygonOuterBorder()
  - createRegionFromPolygon()
  isValidContour()
  - isValidHole()
  regionDensity()
```

- clearPreviousDetectionResults()- getCollectionOfSpatialEntity

- outputResultsToImage()- outputRegionToImage()- outputRegionOuterBorderTo

- outputRegionInnerBorders

Pseudo3D()

Image()

ToImage()
- convertAlpha()
- convertBeta()