```
multiscale::analysis
                                  ::Detector
                     # image
                      # outputFilepath
                      # debugMode
                      # outputImage
                      # detectMethodCalled
                      # detectorSpecificFieldsInitialised
                     # origin
                     + Detector()
                     + ~Detector()
                     + detect()
                     + outputResults()
                     # initialise()
                      # initialiseDetectorSpecific
                      FieldsIfNotSet()
                      # setDetectorSpecificFields
                      InitialisationFlag()
                      # initialiseDetectorSpecific
                      Fields()
                      # initialiseImageDependent
                      Fields()
                      # initialiseDetectorSpecific
                      ImageDependentFields()
                      # initialiseImageOrigin()
                     # isValidInputImage()
                      # detect()
                     # detectInDebugMode()
                      # detectInReleaseMode()
                      # polygonAngle()
                      # polygonAngle()
                      # minAreaRectCentre()
                      # findGoodPointsForAngle()
                      # findGoodIntersectionPoints()
                      # displayResultsInWindow()
                      # outputResultsToFile()
                     # outputResultsToImage()
                     # storeOutputImageOnDisk()
                      # outputResultsToCsvFile()
                      # outputResultsToCsvFile()
                      # processImageAndDetect()
                      # clearPreviousDetectionResults()
                      # createTrackbars()
                      # createTrackbarsWindow()
                      # createDetectorSpecificTrackbars()
                      # processPressedKeyRequest()
                      # displayImage()
                      # printOutputErrorMessage()
                                            multiscale::analysis
                                                     ::RegionDetector
                                            - avgClusterednessDegree
                                            - avgDensity
                                            - alpha
                                            - beta
                                            - blurKernelSize
                                            - morphologicalCloseIterations

    epsilon

                                            - regionAreaThresh

    thresholdValue

multiscale::analysis
                                            - regions
         ::ClusterDetector
                                            + RegionDetector()
# clusterednessIndex
                                            + ~RegionDetector()
# avgPileUpDegree
                                            + getAlpha()
# entityPileupDegree
                                            + getBeta()
                                            + getBlurKernelSize()
                                            + getEpsilon()
                                            + getMorphologicalCloseIterations()
+ ClusterDetector()
                                            + getOriginXCoordinate()
+ ~ClusterDetector()
                                            + getOriginYCoordinate()
                                            + getRegionAreaThresh()
                                            + getThresholdValue()
                                            + getRegions()
                                            + setAlpha()
                                            + setBeta()
# initialiseDetectorSpecific
                                            + setBlurKernelSize()
                                            + setEpsilon()
                                            + setMorphologicalCloseIterations()
# createDetectorSpecificTrackbars()
# clearPreviousDetectionResults()
                                            + setOriginXCoordinate()
# processImageAndDetect()
                                            + setOriginYCoordinate()
# detectEntitiesInImage()
                                            + setRegionAreaThresh()
                                            + setThresholdValue()
# detectAndAnalyseClusters()
# detectClusters()

    initialiseDetectorSpecific

# convertEntities()
                                            Fields()
# convertNonPiledUpEntities()
                                            - initialiseDetectorSpecific
# convertPiledUpEntities()
                                            ImageDependentFields()
# addEntitiesToClusters()
                                            - createDetectorSpecificTrackbars()
                                            - processImageAndDetect()
# analyseClusters()
# analyseClustersOriginDependent
                                            - changeContrastAndBrightness()
                                            - smoothImage()
# updateClusterOriginDependent
                                            - morphologicalClose()
                                            thresholdImage()
# getClusterConvexHull()
                                            - findRegions()
                                            - computeAverageMeasures()
# computeClusterednessIndex()
# computeAveragePileUpDegree()

    findContoursInImage()

# outputResultsToCsvFile()
                                            - createRegionFromPolygon()
# convertEpsValue()
                                            isValidRegion()
# getValidMinPointsValue()
                                            regionClusterednessDegree()
                                            - regionDensity()
                 Д
                                            regionArea()
                                            regionHolesArea()

    clearPreviousDetectionResults()

                                            - outputResultsToCsvFile()
                                            - outputRegionsToCsvFile()

    outputAveragedMeasuresTo

                                            CsvFile()
                                            - outputResultsToImage()
                                            - convertAlpha()
```

eps

minPoints

clusters

+ getEps()

Fields()

Values()

Values()

+ getMinPoints()

+ setMinPoints()

+ getClusters() + setEps()

- multiscale::analysis ::SimulationClusterDetector
- thresholdedImage - height
- width
- entityHeight
- entityWidth

convertBeta()

- + SimulationClusterDetector() + ~SimulationClusterDetector()
- ImageDependentFields() - initialiseThresholdedImage()
- detectEntitiesInImage()
- isEntityAtPosition()

- initialiseDetectorSpecific

- getEntityCentrePoint()
- getEntityContourPoints()
- computePileUpDegreeAtPosition() - outputResultsToImage()
- outputClusterToImage() outputClusterShape() - outputClusterTriangularShape()
- outputClusterRectangular
- Shape() - outputClusterCircularShape()