Spatial Fuzzy C-Means plugin in ImageJ
micro user guide

Installation

Put the **sfcm_clustering.jar** into the ImageJ *plugins* folder and re-launch it. Under the menu *Plugin>Segmentation* you will find four new plugins:
- **Jarek Sacha's K-Means Clustering** the original K-Means plugin by Jarek Sacha
- **REF K-Means Clustering** a refactored K-Means plugin that allows the user to chose the color space, the initialization criterion for the centroid matrix and some new visualization methods
- **Fuzzy C-Means Clustering plugin** that segments an image using the Fuzzy C-Means
- **Spatial Fuzzy C-Means Clustering** implementing a spatial version of the Fuzzy C-Means, more robust to noise and oversegmentation

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Spatial Fuzzy C-Means Clustering User Interface
(the other plugins widgets are included)

Number of cluster in which to segment the image (k).

Maximum number of iterations allowed

Initialization criterion for the V and U matrix:
- K-Means++
- Random U
- Random V
Each criterion can lead to a different result

Window radius (r) used to compute the spatial function
for r = 2 we will have a 5x5 window centered on the current pixel

Spatial function weight (q) used to weight the membership function according to a neighborhood

Visualization mode for the clustered image: regions can be labelled with random RGB colors, gray scaled, as a stack of binary images, or with a stack of 'fuzzy' images, each one representing a cluster and whose pixels indicate the membership u that the original pixel has towards that cluster

Stopping criterion, if the chose criterion outputs a value that goes beneath the threshold value then the algorithm stops

Threshold value used to stop the algorithm

Integer used to seeding a random number sequence used in the initialization

Fuzzyness value (m) when near 1, results similar to K-Means can be computed, 2 means linear normalization

Membership weight (p) used to update the matrix U by using the spatial function

Spatial function (h) kinds: likeliest cluster will compute the sum of the memberships of the pixels in the neighborhood, weightiest cluster will use a defuzzified U

Color space conversion from RGB to HSB, XYZor L*a*b* Gray scaled images cannot be converted

Spatial Fuzzy C-Means Configuration

Number of clusters: 4
Max number of iterations: 400
Stop criterion: Max Norm on U
Tolerance threshold: 0.000100
Initialization Mode: K-Means++
Randomization seed: 48
Fuzzyness parameter: 2.0
Window radius: 2
Membership weight: 1.0
Spatial function: Likeliest Cluster
Spatial function weight: 0.0
Color Space Conversion: None

☐ Show clusters as centroid value
☐ Show clusters as random RGB
☑ Show clusters as gray levels
☐ Show clusters as binary stack
☐ Show clusters as fuzzy stack

Cancel   OK