u-segment Package Description

u-segment package is a MATLAB package for 2D cell segmentation. This package provides a series of methods to create masks for the movie which separate objects (e.g. cells) from the background. Masks are binary images which contain 1 where there is an object of interest (cell), and 0 where there is background.

It is associated with the papers:

Granger-causal inference of the lamellipodial actin regulator hierarchy by live cell imaging without perturbation, *Cell Systems*, 2022, 13(6):471-487.e8, written by Jungsik Noh, Tadamoto Isogai, Joseph Chi, Kushal Bhatt, Gaudenz Danuser.

Functional Hierarchy of Redundant Actin Assembly Factors Revealed by Fine-Grained Registration of Intrinsic Image Fluctuations, *Cell Systems*, 2015, 1(1):37-50, written by Kwonmoo Lee, Hunter L. Elliott, Youbean Oak, Alex Groisman, Jessica D. Tytell, Gaudenz Danuser.

It consists of 4 steps, including optional steps, to create cell masks:

(1) Generate Summation Channel.

(2) Segmentation.

Current available Segmentation methods:

- **Thresholding**
- **MSA (Multi-Scale Automatic) Segmentation**
- **External Segmentation**

(3) Trembling Correction.

(4) Mask Refinement.