

# Classification of Cells Based on Geometrical Features and Supervised Machine Learning

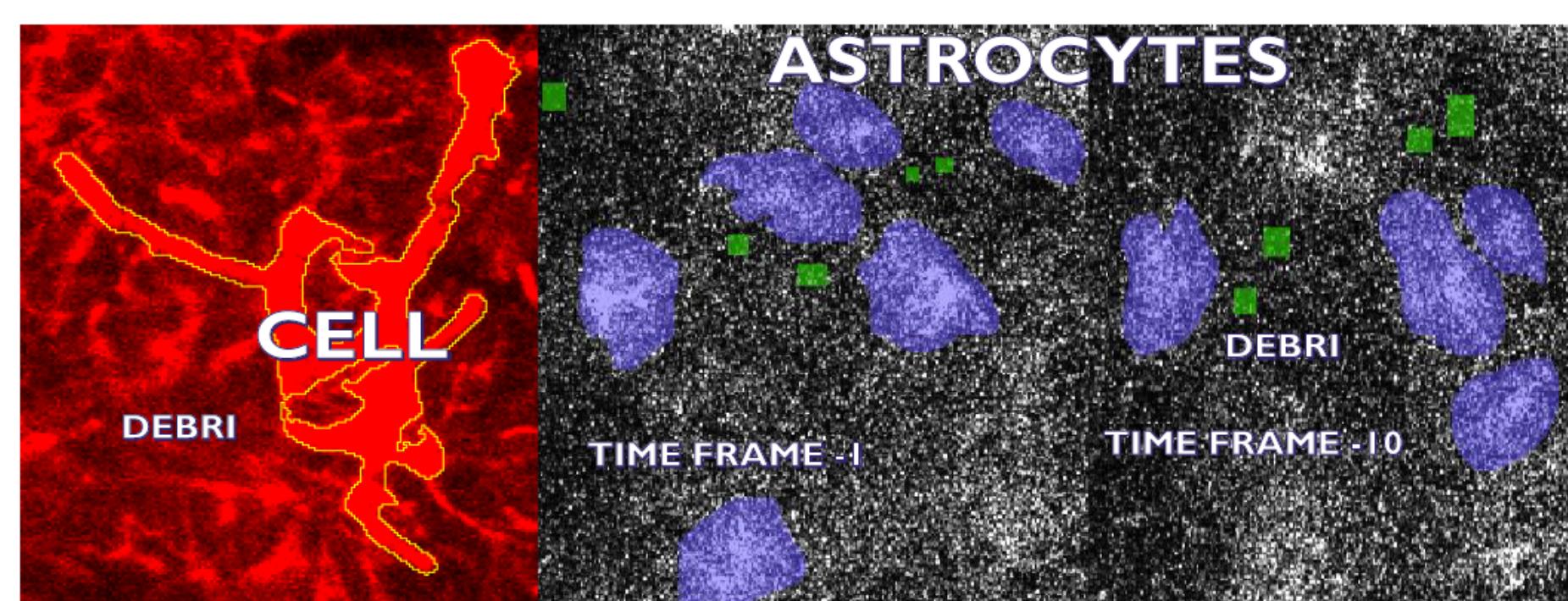


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## Introduction

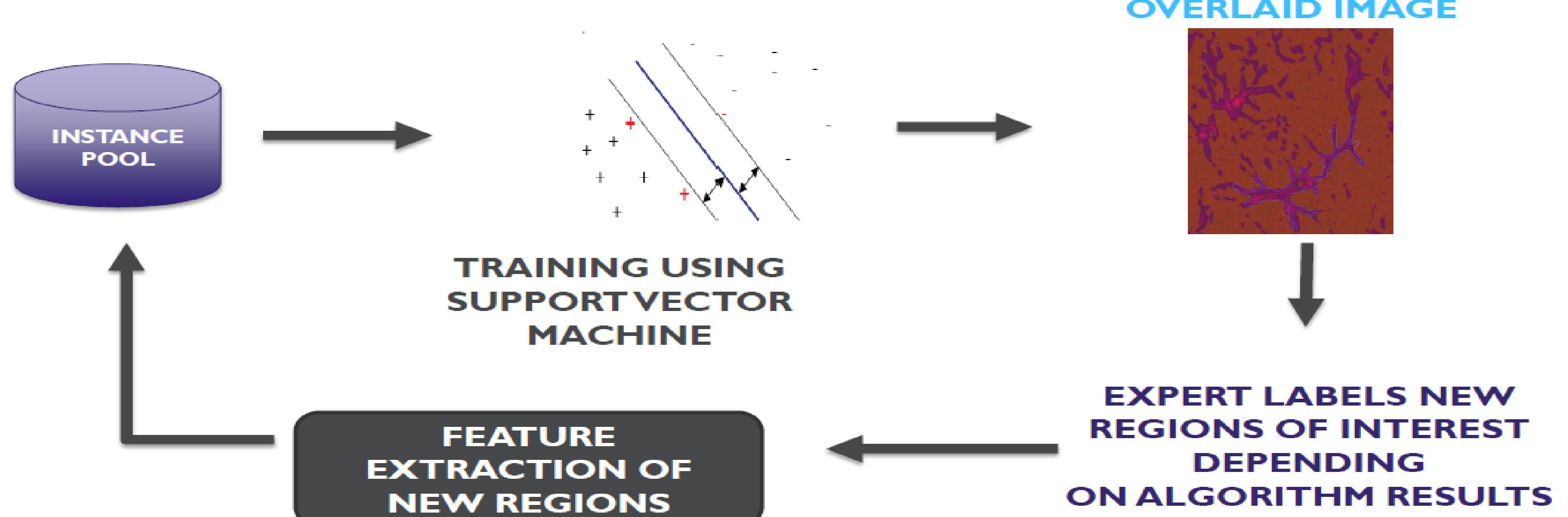
- Sparsity in Dataset.
- No full ground truth.
- Subjectivity in expert assessments.



Anatomic & TimeLapse Images for Segmentation

## Active Learning

Interactively collect new training examples by querying human user



## Features Extraction

### FILTERS

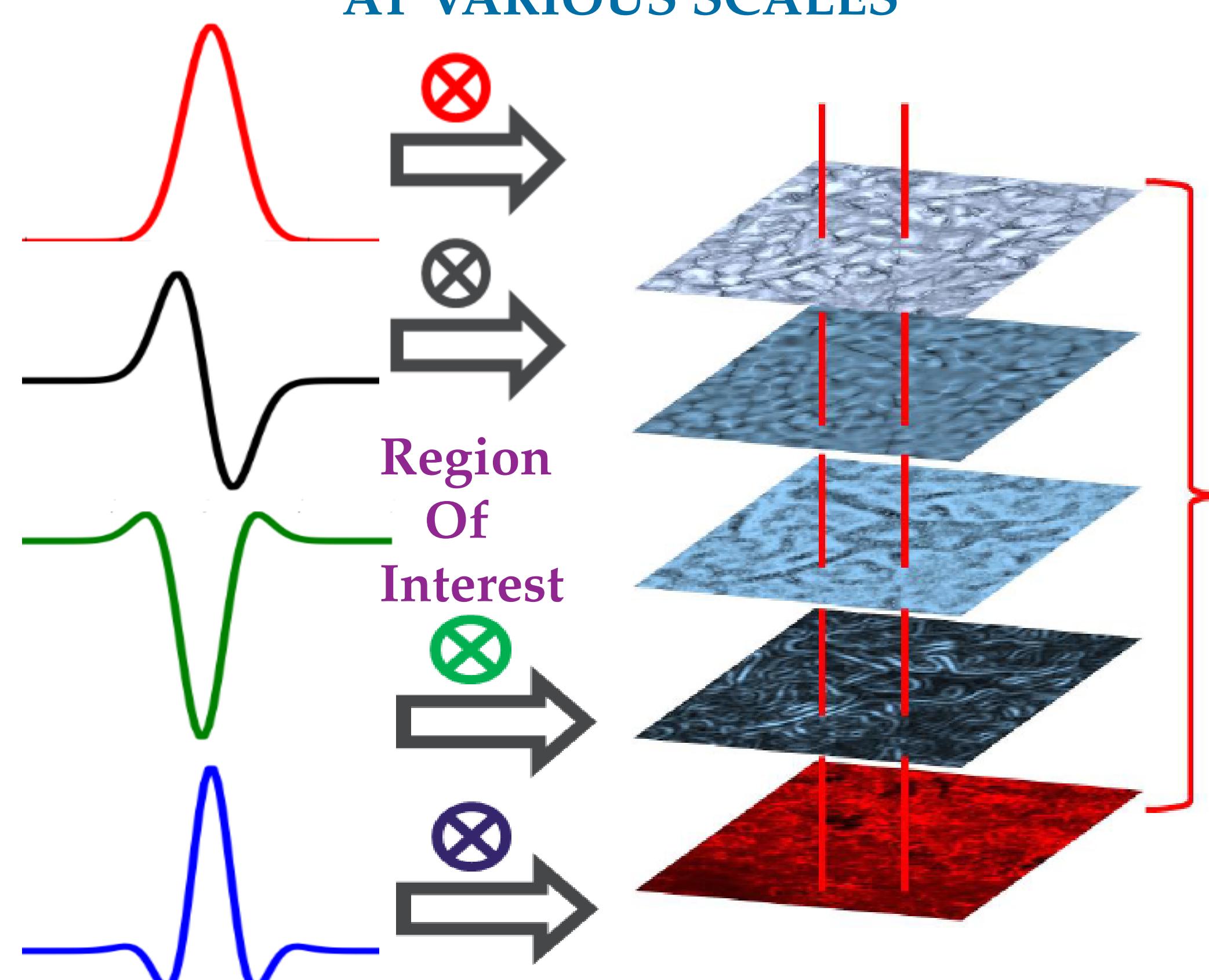
Gaussian

Gaussian X,Y  
Derivatives

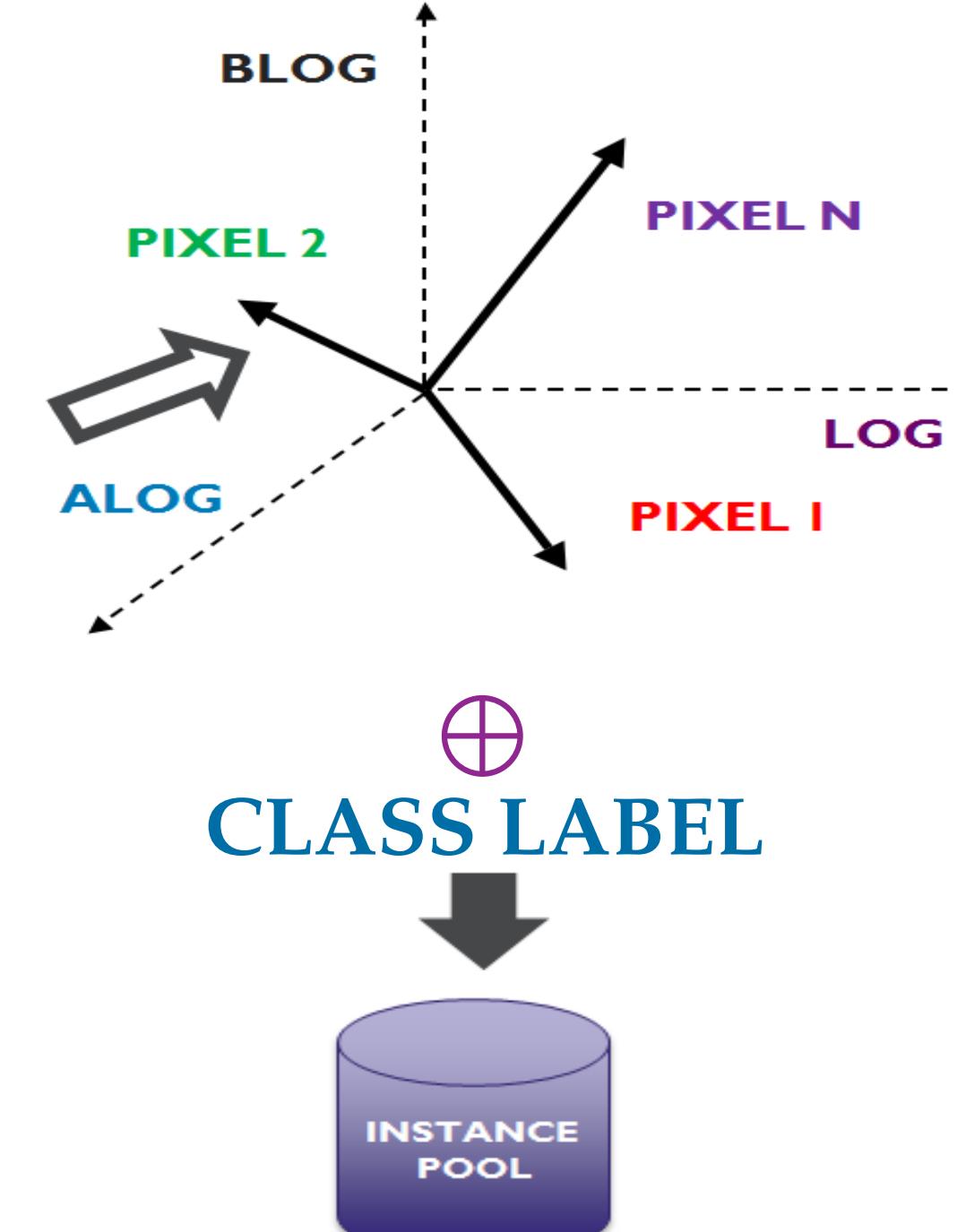
Laplace of Gaussian

BiLaplace of Gaussian

### CONVOLVED ROI AT VARIOUS SCALES



### MULTIDIMENSIONAL FEATURE VECTOR OF EACH PIXEL



## Conclusions & Outlook

Presented Approach is

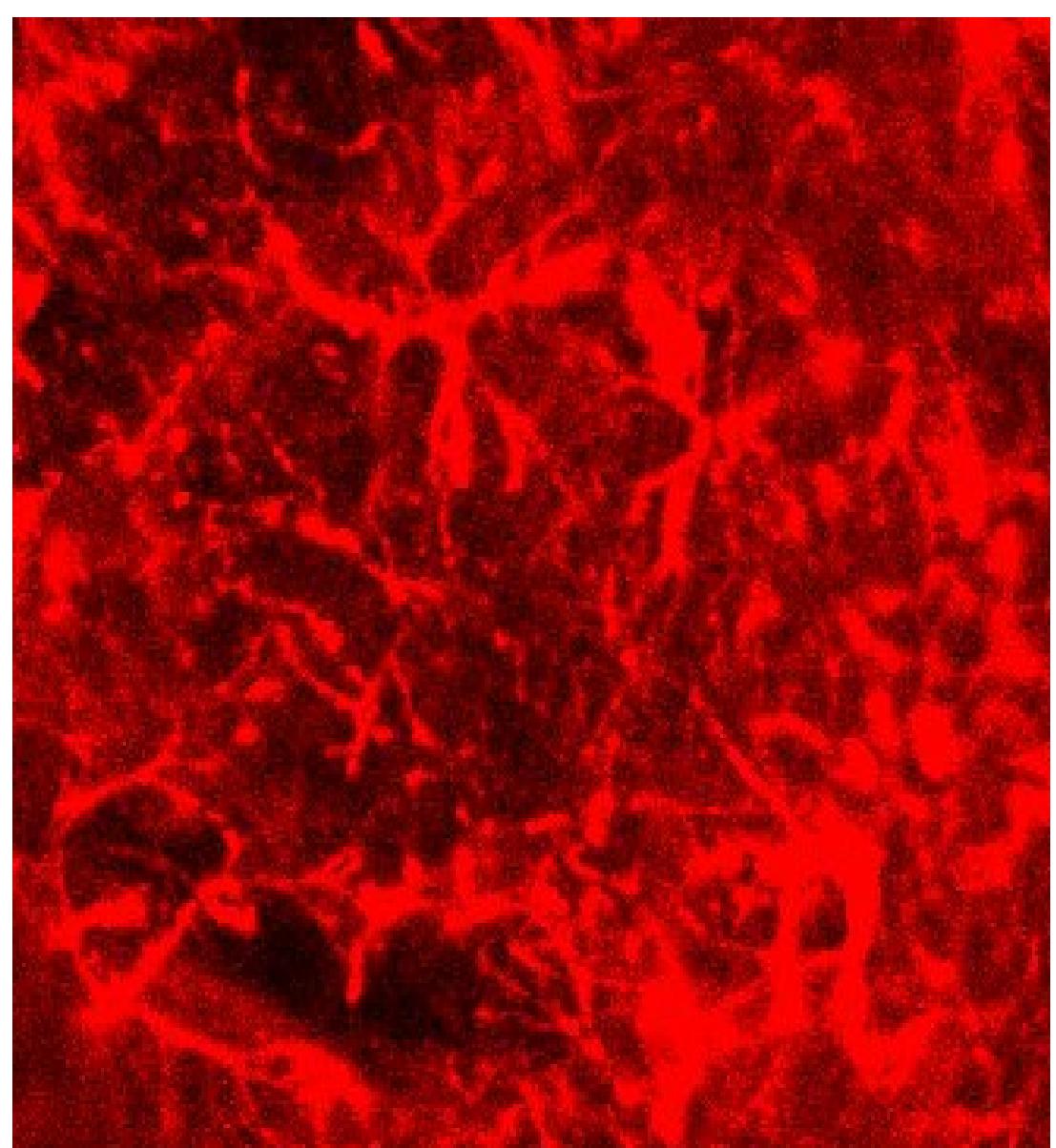
- **Semi Supervised:** The results can be refined with iterations.
- **Cell Type Independent:** not only limited to specific type of cell.

Future efforts will include implementing the Structural SVM or Relational Learning for finding the suitable patterns in astrocytic arbors.

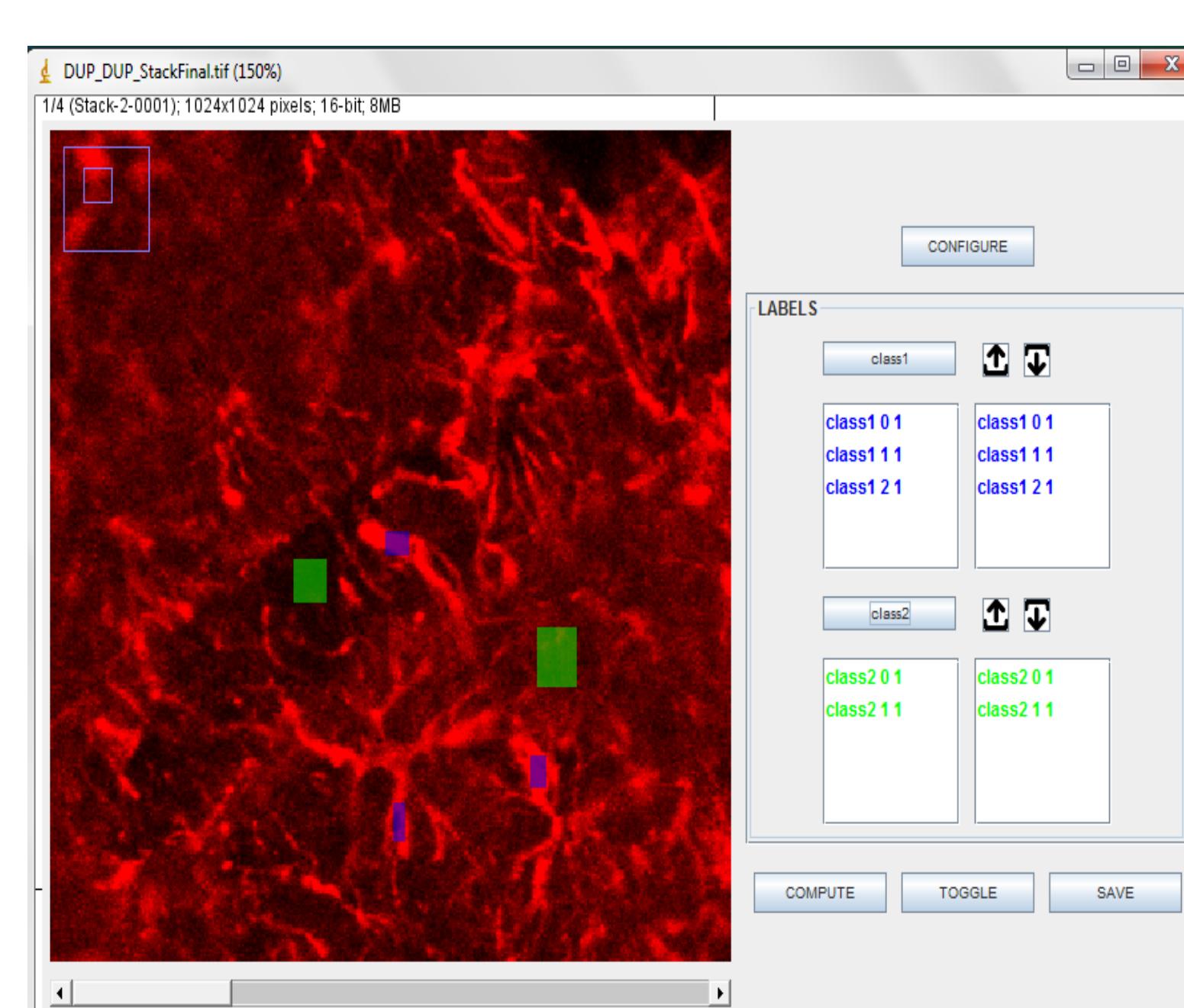
## Results

The Active Segmentation is a ImageJ plugin inspired by trainable Weka Segmentation.

### ASTROCYTES



### TRAINING SCREEN



### SEGMENTED ASTROCYTES

