

Classification of Cells Based on Geometrical Features and Supervised Machine Learning

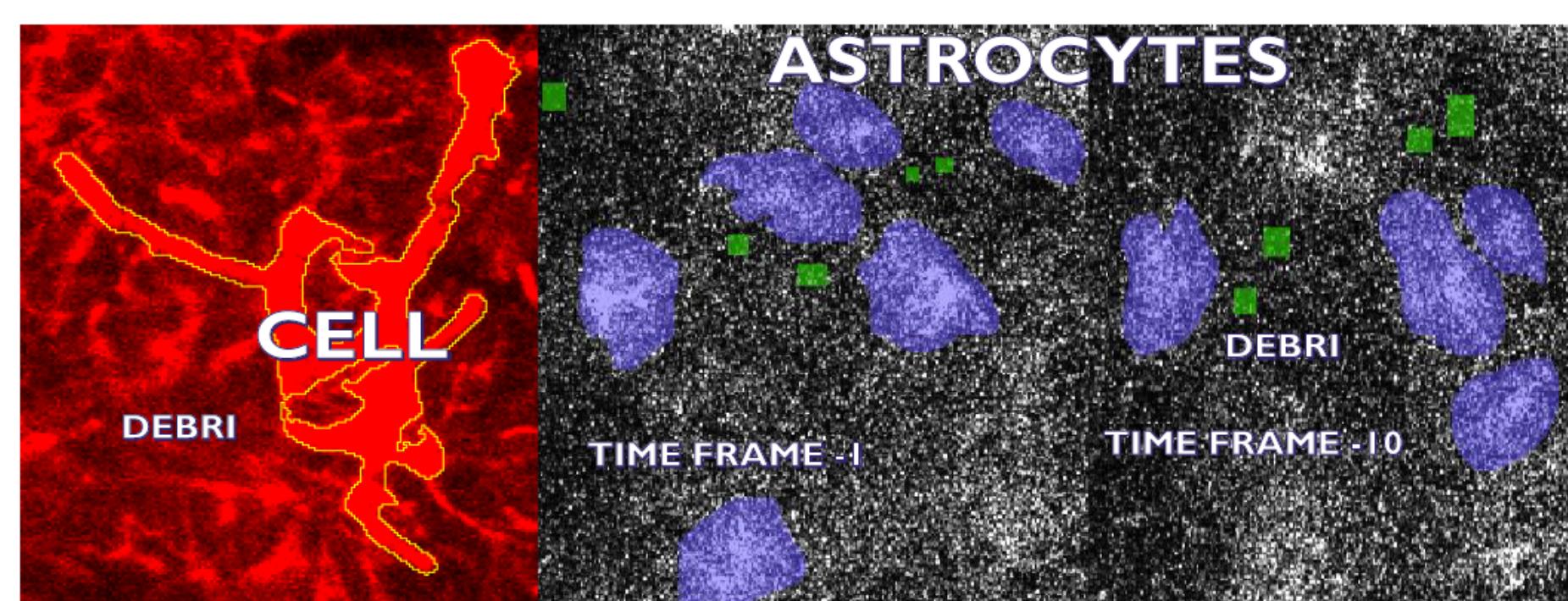


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Introduction

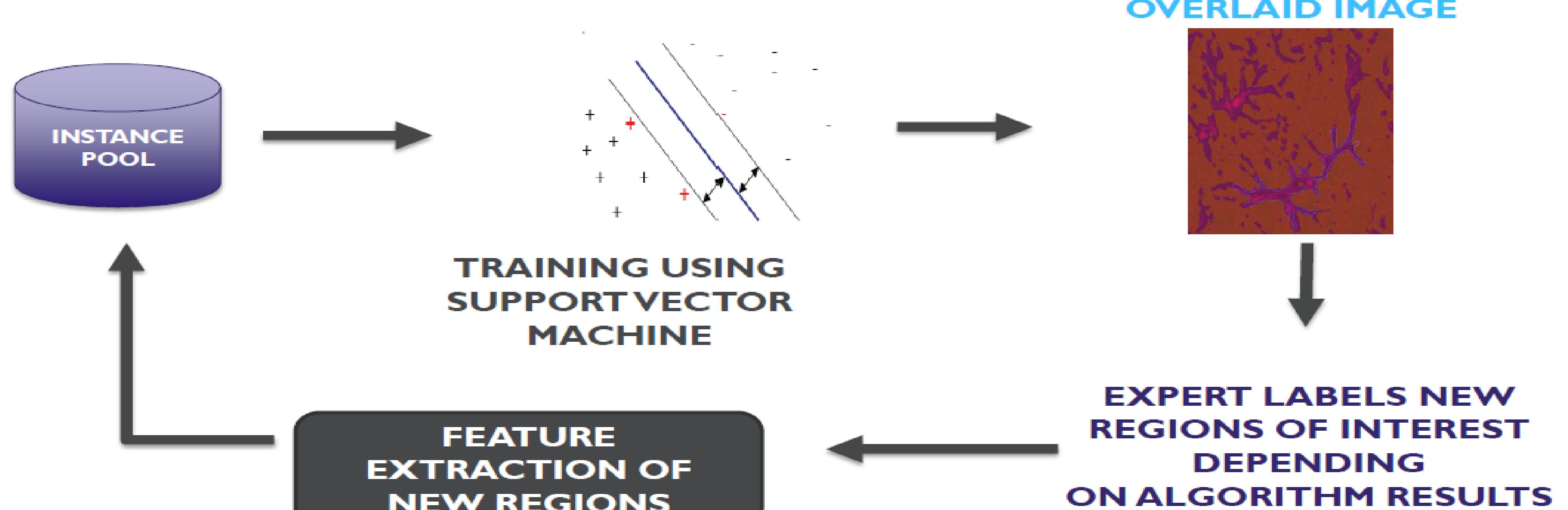
- Sparsity in Dataset.
- No full ground truth.
- Subjectivity in expert assessments.



Anatomic & TimeLapse Images for Segmentation

Active Learning

Interactively collect new training examples by querying human user



Features Extraction

FILTERS

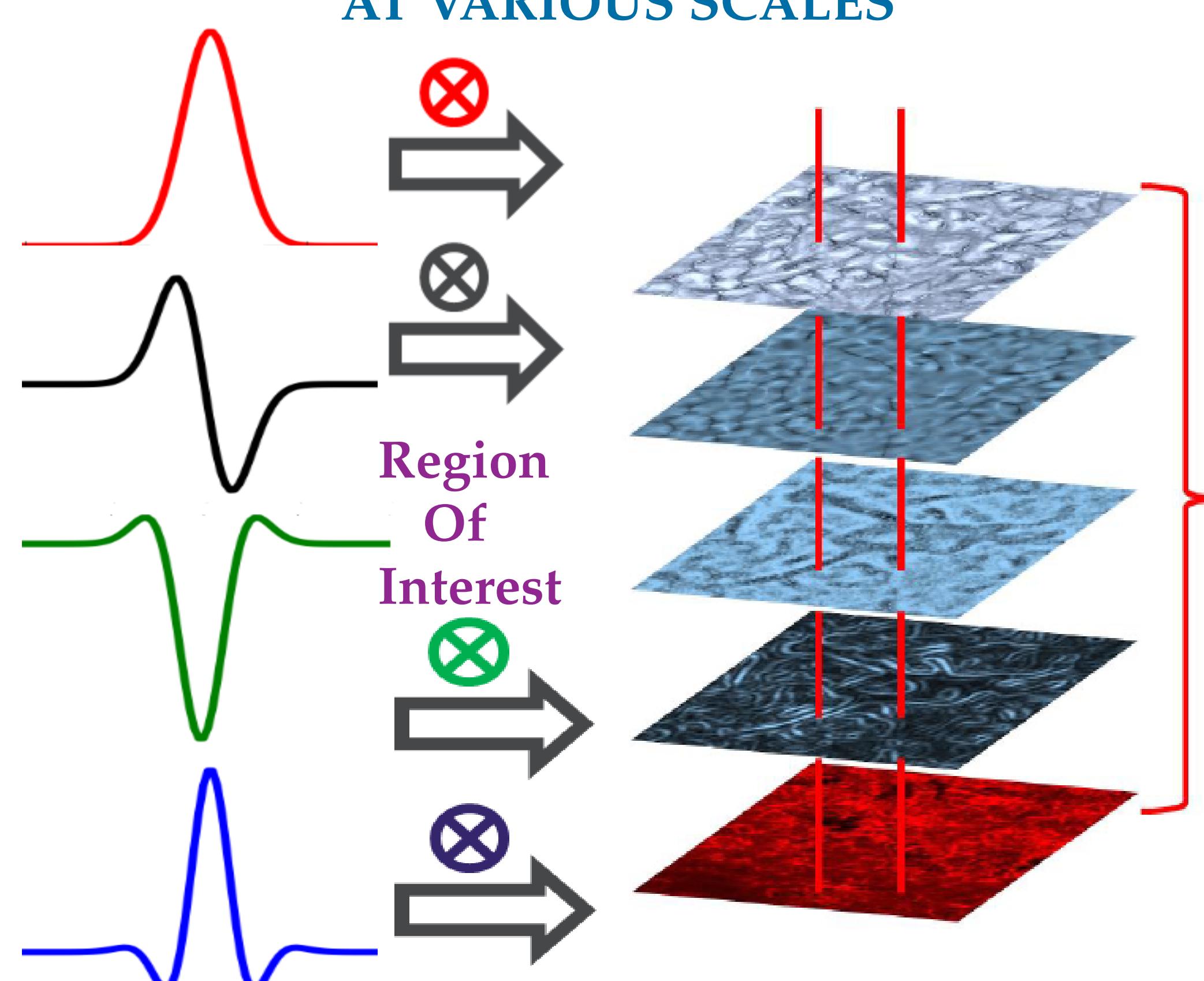
Gaussian

Gaussian X,Y
Derivatives

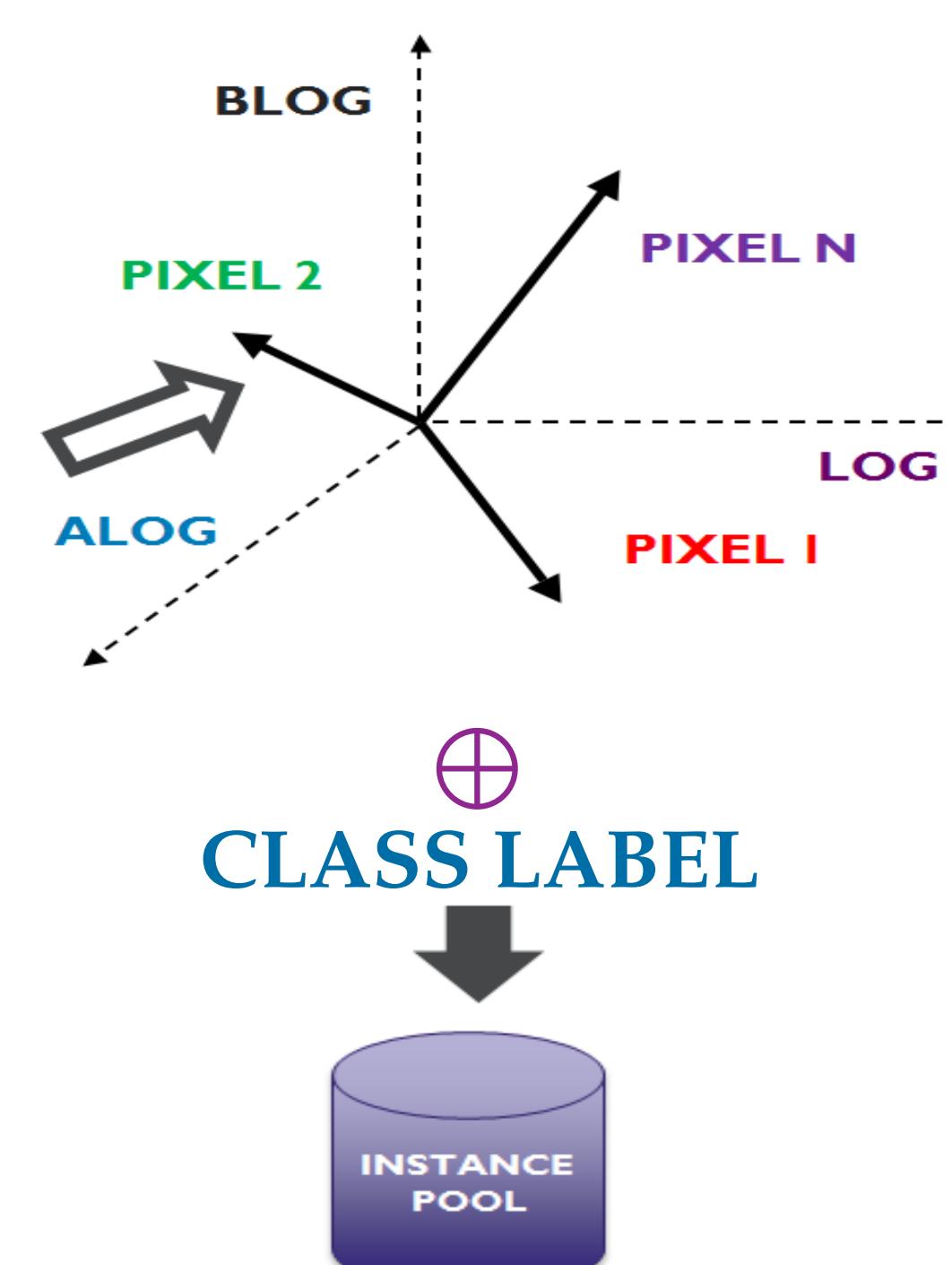
Laplace of Gaussian

BiLaplace of Gaussian

CONVOLVED ROI AT VARIOUS SCALES



MULTIDIMENSIONAL FEATURE VECTOR OF EACH PIXEL



Conclusions & Outlook

Presented Approach is

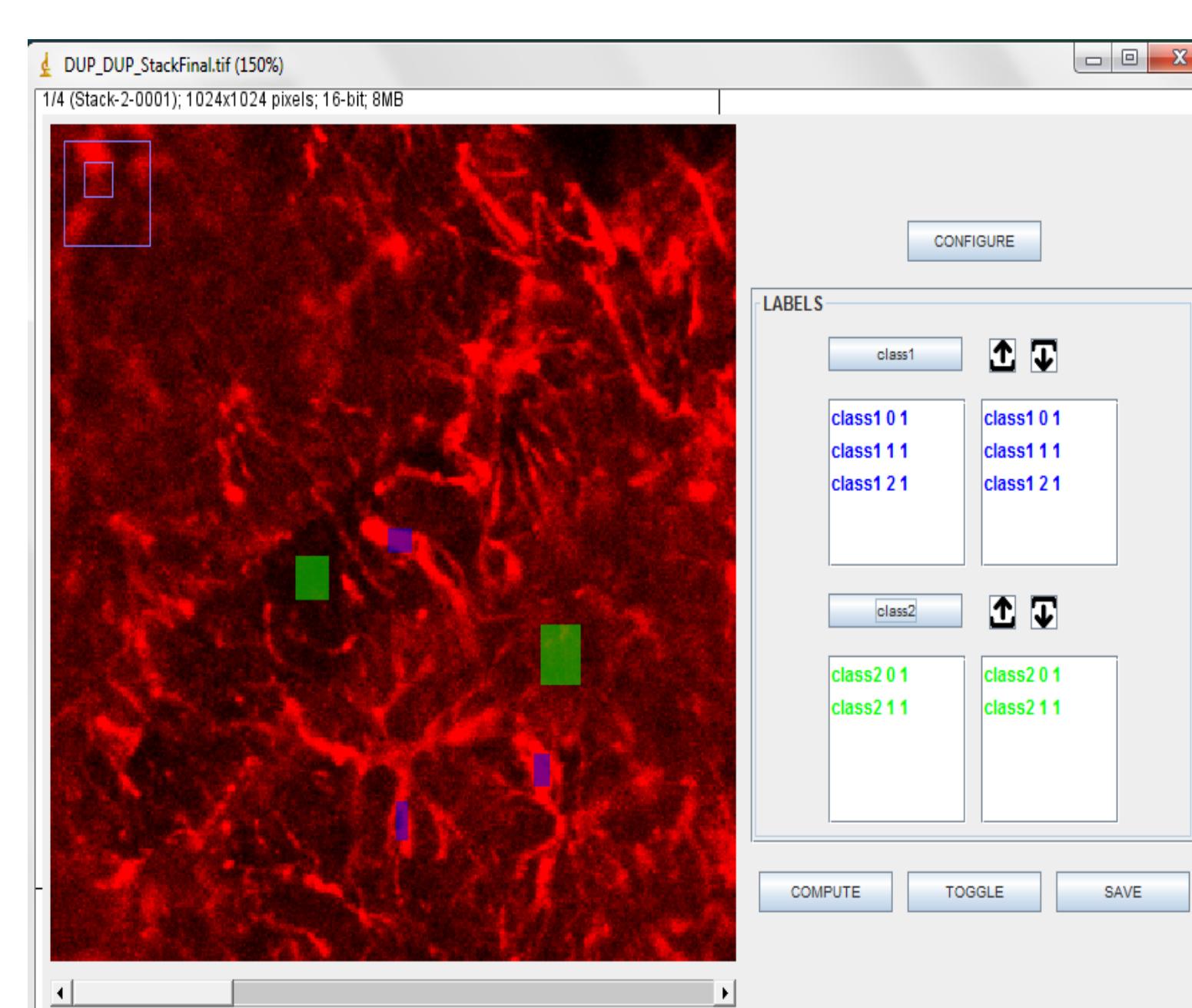
- **Semi Supervised:** The results can be refined with iterations.
- **Cell Type Independent:** not only limited to specific type of cell.

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.

TRAINING SCREEN



ASTROCYTES

FILTER SCREEN



SEGMENTED ASTROCYTES

