MIP Report

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Implementations

- Inpainting using curvature preserving PDEs
  - Tschumperlé, David. "Fast anisotropic smoothing of multi-valued images using curvature-preserving PDE's." *International Journal of Computer Vision* 68.1 (2006): 65-82.
- Inpainting using non-negative sparse coding

Results

Curvature preserving PDEs #1

Ground truth

Input

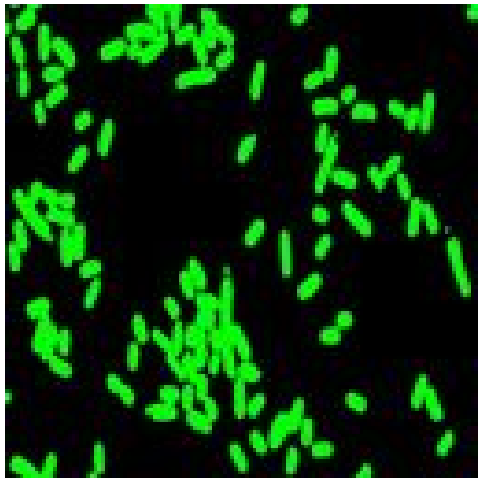
Output

Curvature preserving PDEs #1

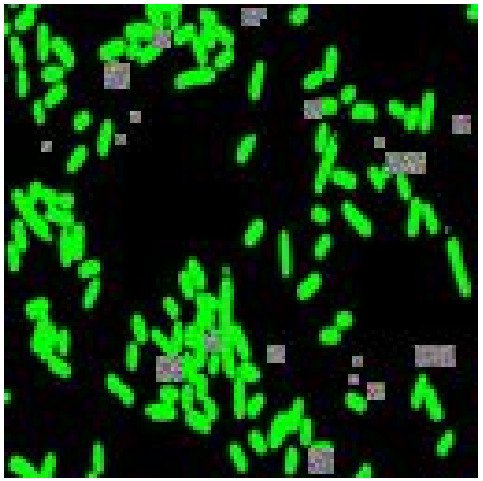
Observations:

- Inpainting is very good when the hole is far from the edges
- For holes close to the image edges, percolation from the edge side is not possible. Hence, the results are not good. Increasing the maximum distance helps in this matter but it results in overextending the range at other regions
- Inpainting struggles when there are multiple curves intersecting, e.g. in the hair

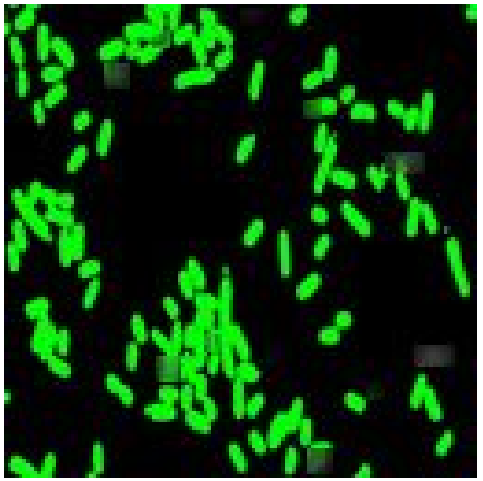
Curvature preserving PDEs #2



Ground truth



Input



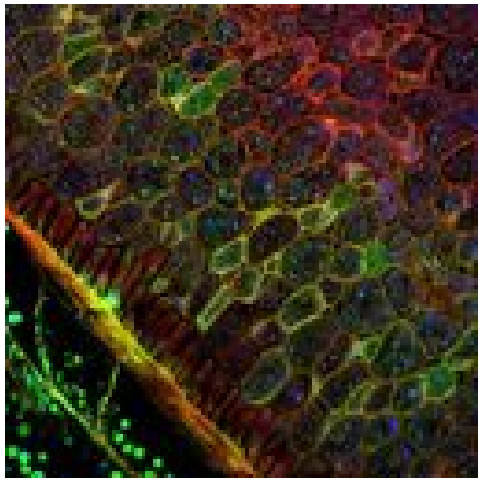
Output

Curvature preserving PDEs #2

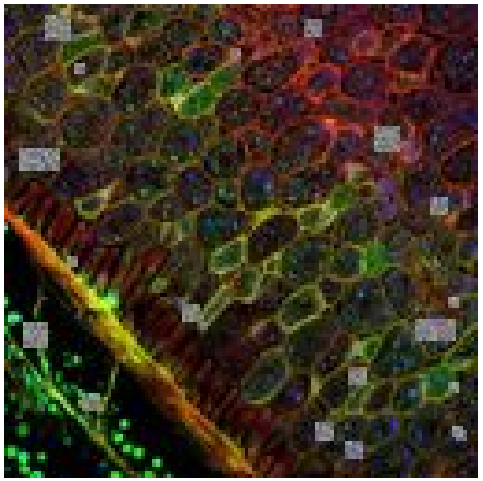
Observations:

- Decent results; The extent of the cells with holes is ambiguous and the algo tends to keep on extending the cellular regions

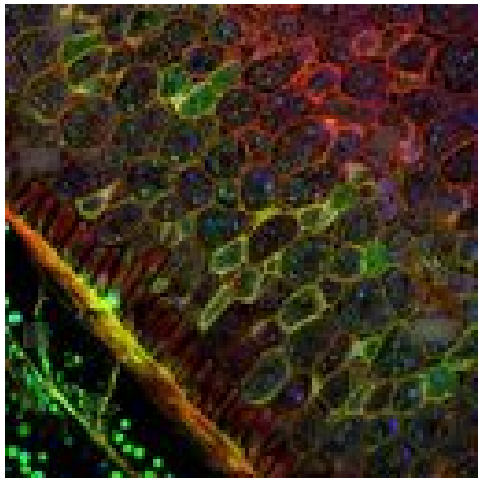
Curvature preserving PDEs #3



Ground truth



Input



Output

Curvature preserving PDEs #3

Observations:

- Decent results when the region in relatively texture free and has only few edges (e.g hole in the green region on middle-extreme left)
- Poor results in case in heavy texturing (e.g. middle-extreme right)

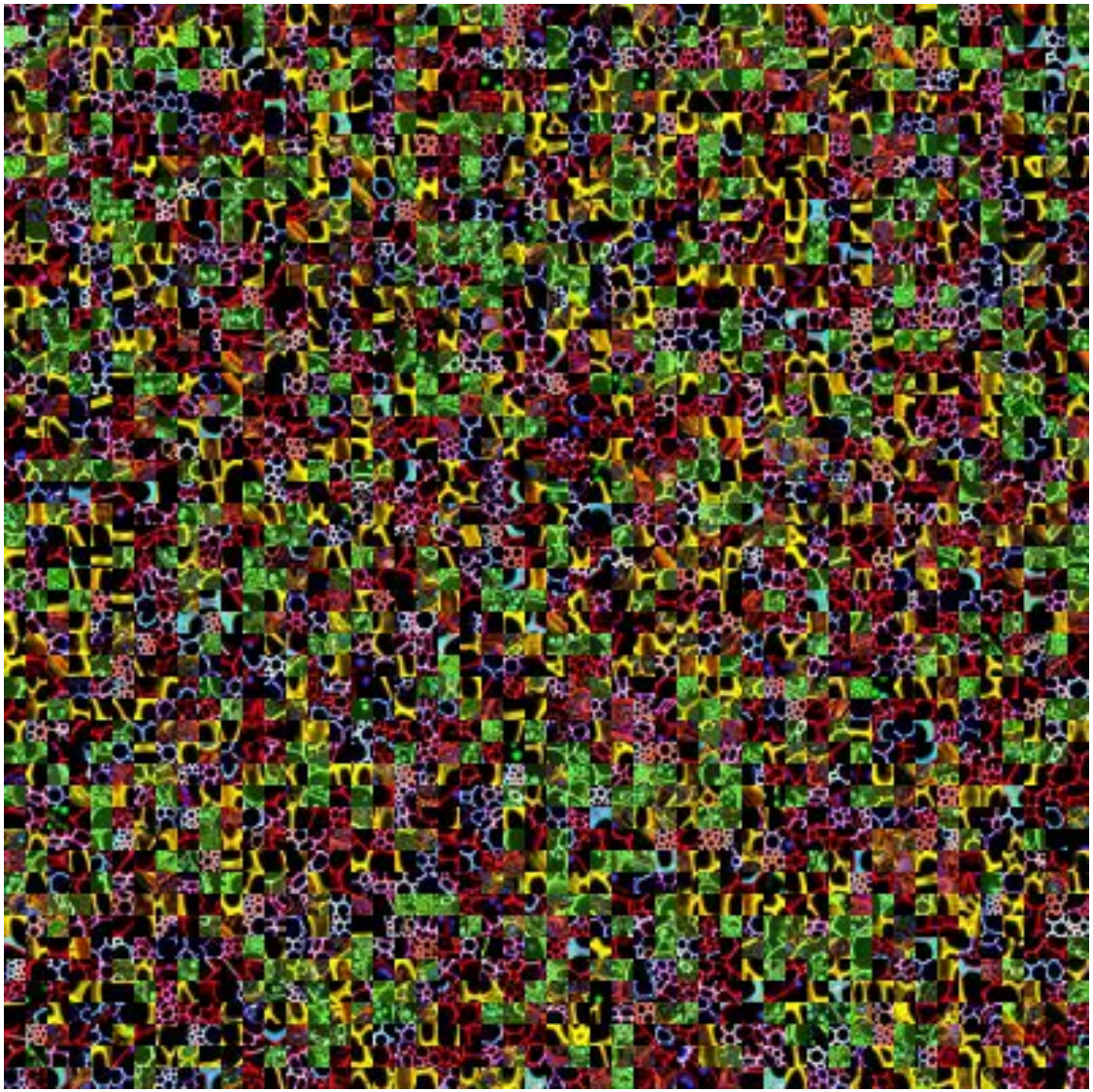
NNSC

NNSC

- Experiment on images of plant cells
- 8*8 patch size
- 529 atoms in the dictionary

Note: The inpainting algo requires parameter tuning which could **not** be done due to lack of time.

NNSC training set



Dictionary