

CellOrganizer 2.1 Release Notes

April 29, 2014
<http://cellorganizer.org>

New Features

1. Models can be constructed with current processed results rather than waiting for all per-cell-parameterizations to complete.
2. Diffeomorphic model synthesis demos to show users how to synthesize images from parametric and non-parametric representations, as well as manually select locations in shape space.
3. 3T3 Diffeomorphic model added to CellOrganizer.
4. Per-cell-parameterizations can now be saved to disk.
5. CellOrganizer now supports wildcards, paths and function handles for valid image input.

Bug Fixes and Enhancements

- Major speed improvements in 2D model training.
- Debug and verbose parameters now accept logical, numerical or string input.
- Vesicular objects are now rendered correctly.
- Cell shape synthesis correct to reflect changes in cell shape learning.
- “Medial axis” model changed to “major axis” model for 3D models.
- Removed deprecated parameters.
- Object placement parameters for pattern synthesis optimized for performance.
- Model save names have been corrected in demos.
- Improved backwards comparability between diffeomorphic models.
- Various fixes related to multiresolution demos.
- Diffeomorphic training no longer errors out when images are missing.
- Fixed bug where diffeomorphic model parameters were not getting saved in model and use in training.
- Fixed bug where nuclei had flat ends in 2D.
- Various fixes related to overloading some variables.
- Enhanced image alignment for diffeomorphic models.
- Bug fixes when padding some images.
- Diffeomorphic model support for 2D images.
- Diffeomorphic window size can now be user specified.
- Synthesis does not stop if it fails at rendering one vesicular object.

Contributors

This release contains contributions from Ivan Cao-Berg, Devin Sullivan, Gregory R. Johnson, Taraz Buck, Bob Murphy and Gustavo Rohde.

Model files distributed with this version

2D HeLa

Models can be found in models/2D/

Filename	Description
Included in model structure of pattern files	MAS (medial axis spline) and CNR (cell/nucleus ratio) framework models
Nucleolus.mat	Nucleoli
Lysosome.mat	Lysosomes
Endosome.mat	Endosomes
Mitochondrion.mat	Mitochondria

3D HeLa

Models can be found in models/3D/

Filename	Description
Included in model structure of pattern files	CSS (cylindrical spline surface) and CNR (cell/nucleus ratio) framework models
hela_model.mat	LDDMM combined framework model
Nuc.mat	Nucleoli
Lamp2.mat	Lysosomes
Tfr.mat	Endosomes
Mit.mat	Mitochondria
Centro.mat	Centrosome
Tub.mat	Microtubules

3D 3T3

Models can be found in models/3D/

Filename	Description
Included in model structure of pattern files	CSS (cylindrical spline surface) and CNR (cell/nucleus ratio) framework models
3t3_model.mat	LDDMM combined framework model

Model files planned for distribution with future releases

Additional models will be released shortly. These will include a 3D LDDMM combined framework model for NIH 3T3 cells and a MAS/CNR framework for Chinese Hamster Ovary cells.