deepImageJ

A user-friendly environment to run deep Learning models in ImageJ

deepimagej.github.io

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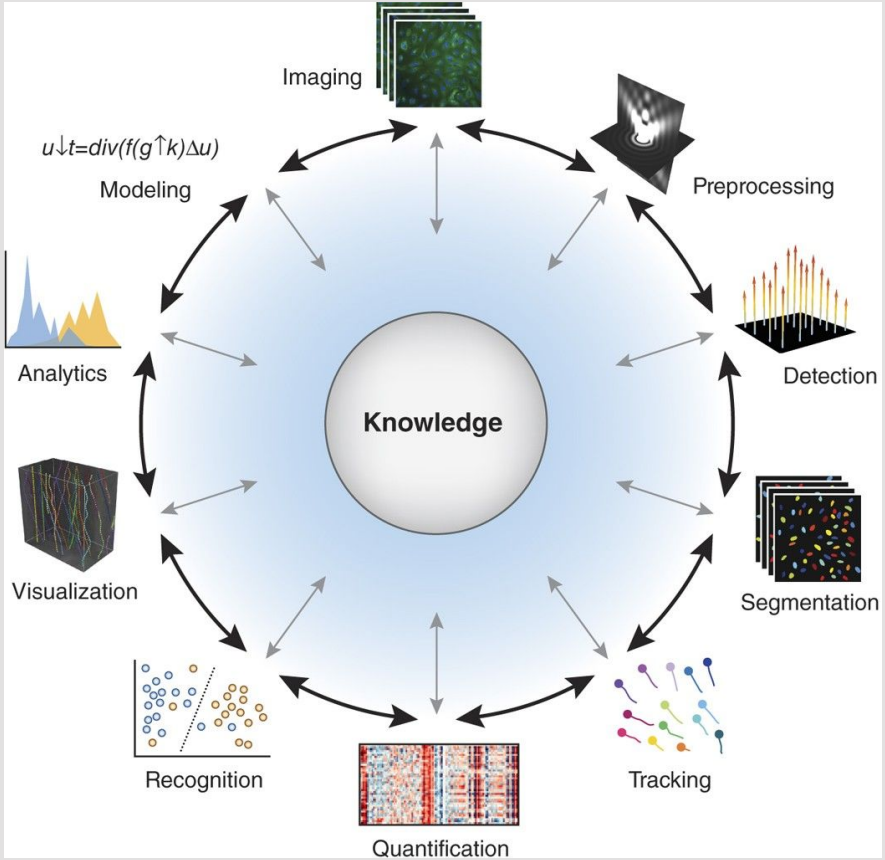
Caterina Fuster-Barceló

cfusterbarcelo.github.io

- What is deepImageJ?
- What is the BioImage Model Zoo?
- Hands on



E. Meijering et al., Nature Biotechnology 2016

nature methods

deepImageJ: A user-friendly environment to run deep learning models in ImageJ

E. Gómez-de-Mariscal, C. García-López-de-Haro, W. Ouyang, L. Donati, E.Lundberg, M. Unser, A. Muñoz-Barrutia, D. Sage

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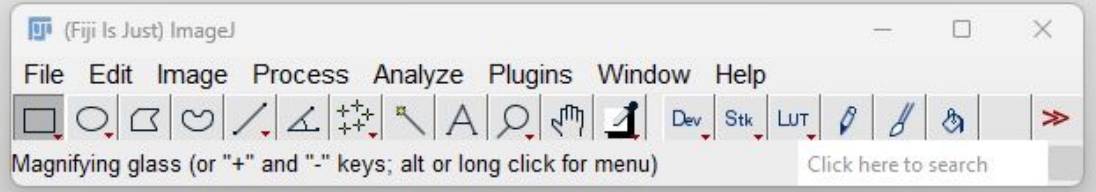
User friendly

Open Source

Widely used among life scientists

Fully equipped for scientific image **visualization** and **quantification**



A Fiji plugin for Deep Learning with zero-code experience

Easy-to-use

Macro Recordable

Unifying interface for Tensorflow-Pytorch models

Ready out-of-the-box

One-click installation

Runs on laptop/CPU/GPU

Existing repository of models

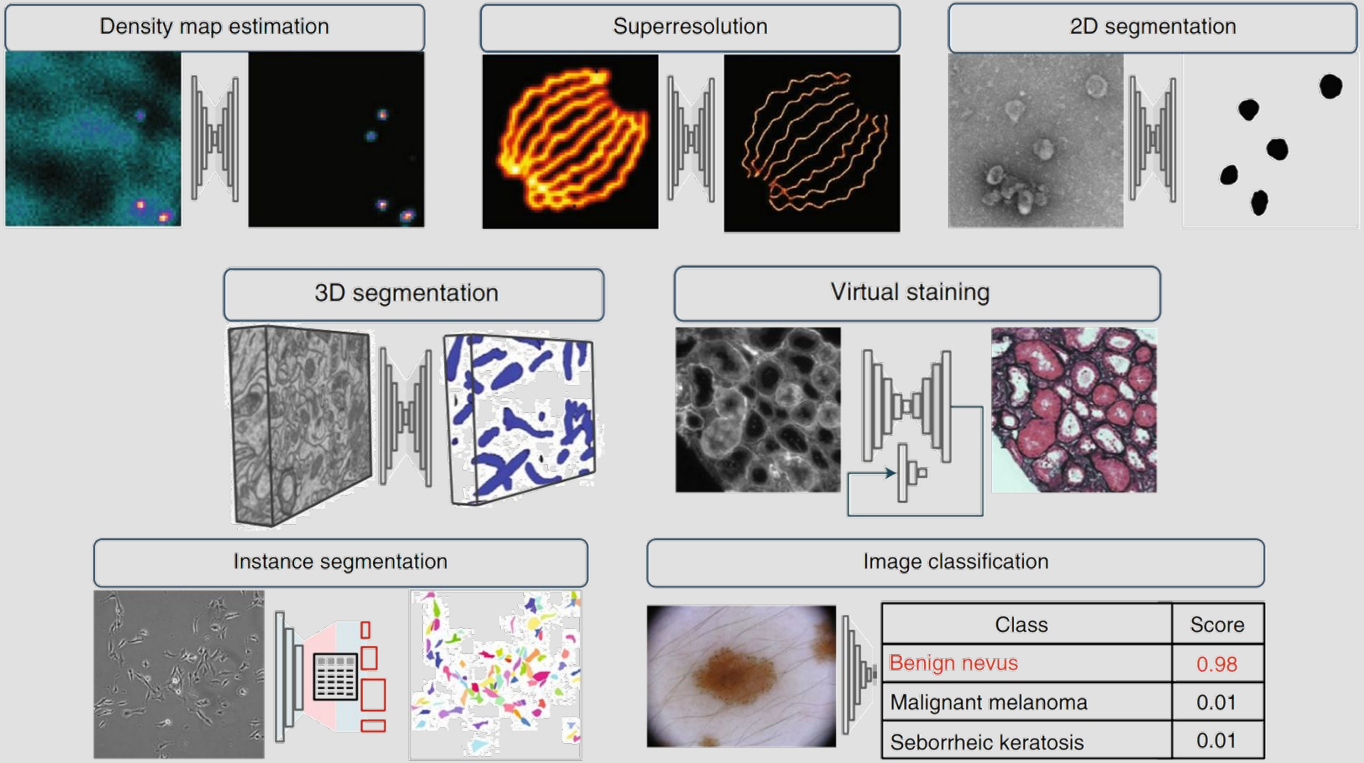
Accessible models

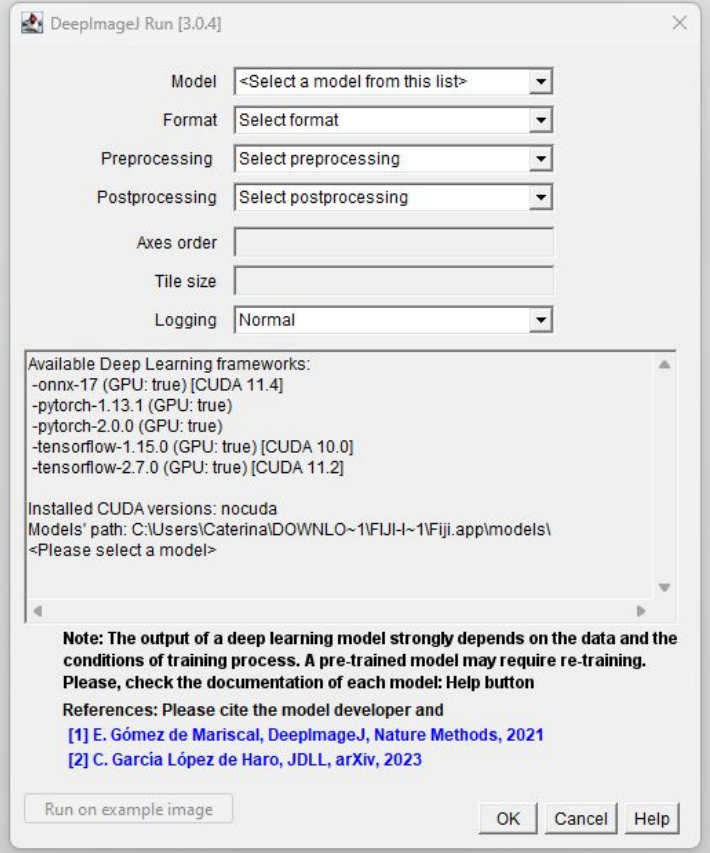
Easy **model sharing**

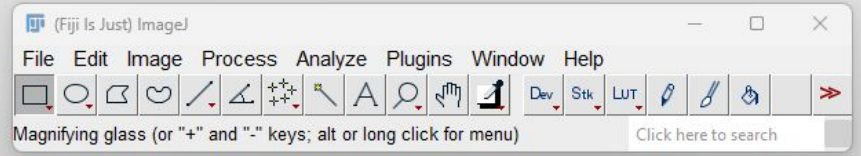
Ready to use models

GUI to build the bundled model

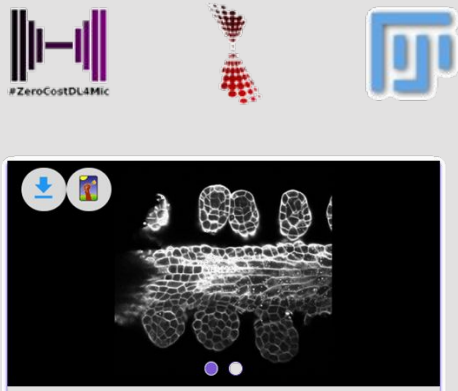
Bioimage analysis tasks with **deepImageJ**




DeepImageJ Run [3.0.4]
Model
<Select a model from this list>
Format
Select format
Preprocessing
Select preprocessing
Postprocessing
Select postprocessing
Axes order
Tile size
Logging
Normal
Available Deep Learning frameworks:
-onnx-17 (GPU: true) [CUDA 11.4]
-pytorch-1.13.1 (GPU: true)
-pytorch-2.0.0 (GPU: true)
-tensorflow-1.15.0 (GPU: true) [CUDA 10.0]
-tensorflow-2.7.0 (GPU: true) [CUDA 11.2]
Installed CUDA versions: nocuda
Models' path: C:\Users\Caterina\DOWNLO~1\FIJI-I~1\Fiji.app\models\
<Please select a model>
Note: The output of a deep learning model strongly depends on the data and the conditions of training process. A pre-trained model may require re-training. Please, check the documentation of each model: Help button
References: Please cite the model developer and
[1] E. Gómez de Mariscal, DeepImageJ, Nature Methods, 2021
[2] C. García López de Haro, JDLL, arXiv, 2023
Run on example image
OK
Cancel
Help


(Fiji Is Just) ImageJ
File
Edit
Image
Process
Analyze
Plugins
Window
Help
Dev
Stk
LUT
Magnifying glass (or "+" and "-" keys; alt or long click for menu)
Click here to search

BioImage Model Zoo: A Community-Driven Resource for Accessible Deep Learning in BioImage Analysis



2D UNet Arabidopsis Ovules

2D Unet trained on confocal images of Arabidopsis Ovules

cell-segmentation plantseg unet 2d ...

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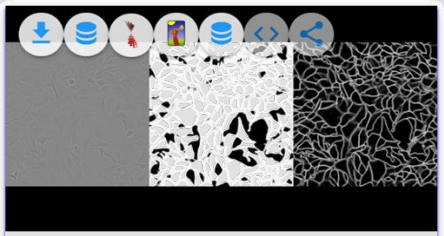

LiveCellSegmentationBound...

Cell segmentation for phase-contrast microscopy.

2d transmission-light-microscopy label-free cells ...

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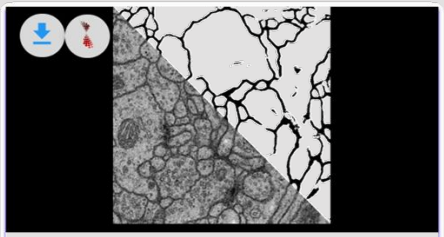

Neuron Segmentation in 2D ...

2D UNet trained using ZeroCostDL4Mic notebooks on data from ISBI...

zerocostdl4mic deepimagej segmentation electron-microscopy ...

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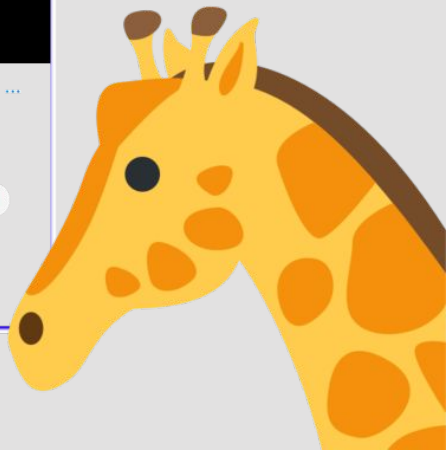
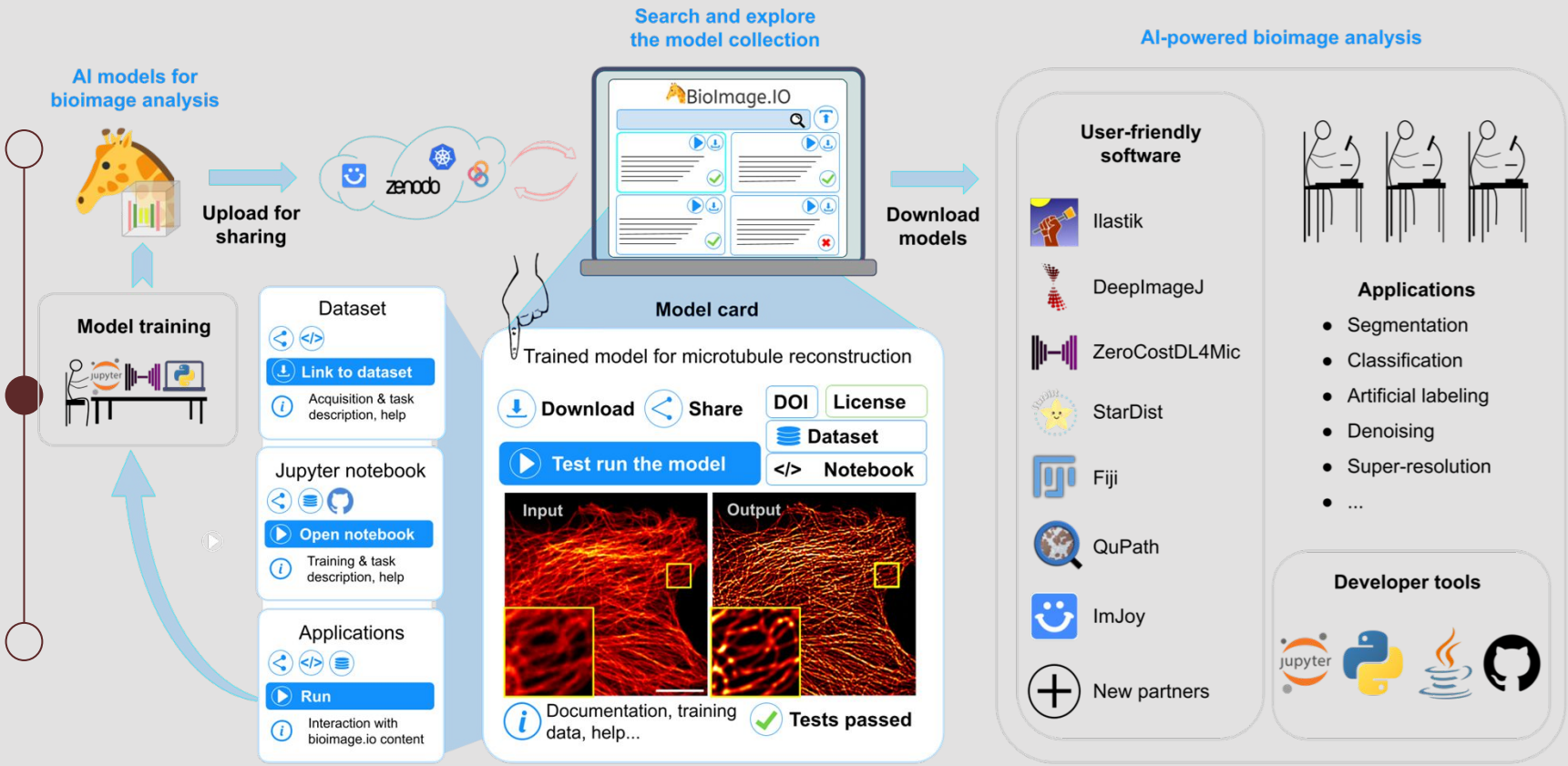
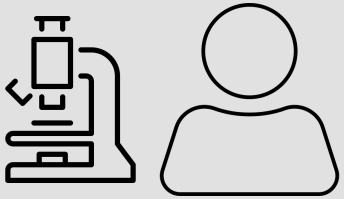
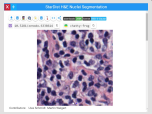


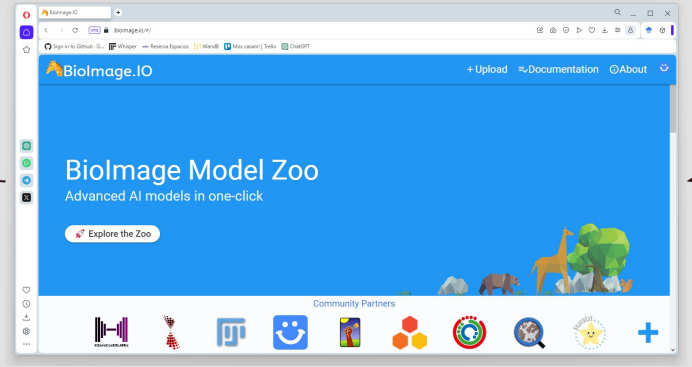

AI models for bioimage analysis
Upload for sharing
zenodo
Search and explore the model collection
BioImage.IO
Download models
AI-powered bioimage analysis
Model training
Dataset
Link to dataset
Acquisition & task description, help
Jupyter notebook
Open notebook
Training & task description, help
Applications
Run
Interaction with bioimage.io content
Model card
Trained model for microtubule reconstruction
Download
Share
DOI
License
Dataset
Test run the model
</> Notebook
Input
Output
Documentation, training data, help...
Tests passed
User-friendly software
Ilastik
DeepImageJ
ZeroCostDL4Mic
StarDist
Fiji
QuPath
ImJoy
New partners
Applications
Segmentation
Classification
Artificial labeling
Denoising
Super-resolution
...
Developer tools



has data
wants a model

has a model

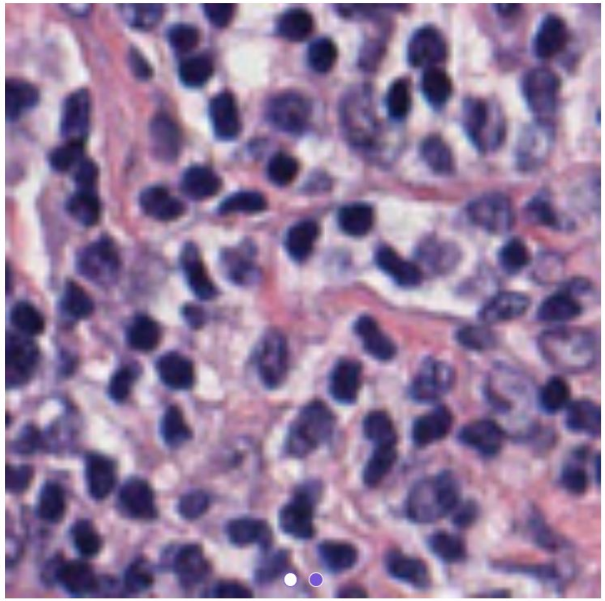




StarDist H&E Nuclei Segmentation

downloads 2064 license BSD-3-Clause

10.5281/zenodo.6338614 chatty-frog



Contributors: Uwe Schmidt Martin Weigert

Hands on!

Slides and material is available here:

github.com/deepimagej/Workshop-materials

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