

How to use celltracking.mlapp

Heng

26 September 2022

I. Open MATLAB and run 'celltracking.mlapp'

CellTracking

Version: 20-07-2022
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File Processing

Current: 1

Image Player

Row: 4, Column: 5, Field: 1, Plane: 1, Channel: 1

First TP: 1, Last TP: 10

Adjusting

Display threshold: 0.005, 0.021

SwitchBox: Off, On

Cell: 30, 60

Similarity: 0.9

Template Matching

Whole Im duplicate

Tracking

AUTO, MANUAL

Cell No.: 1

Coords.: (x,y)

Sister: -1 -1 -1

OPT: 1 235 285 -1 -1 -1

Gen_sis: 2 677 310 -1 -1 -1

Del_IND: 3 542 483 -1 -1 -1

Terminate

Reserve_All

Restore_All

Restore_IND

RESET, LOAD, SAVE, RUN

Frame

Loading Completed.

Cell Tracking Image

Cell 1, 2, 3

I. Open MATLAB and run 'celltracking.mlapp' (cont.)

CellTracking Video

Version: 14-02-2020
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File Processing

/Users/heng/Dropbox/Macbook Pro/Projects/F<

File Type

Columbus Export

Row

Column

Field

Plane

Channel

4

5

1

1

1

Current

1

First TP

1

Last TP

10

☐ Display threshold

Cell Size

Cell Dilate Size

0.005

0.021

Auto

30

5

Mask Generating

Segmented CH

1

masking CH

1,2

RUN

Video

☒ Time Stamp

HR

MIN

SEC

0

:

30

:

0

☒ Cell Number

Frame rate

8

GENERATE

Individual Cell

TIF file

Select no.


1

BOX

60

Current

1



▶

⏸

⏮

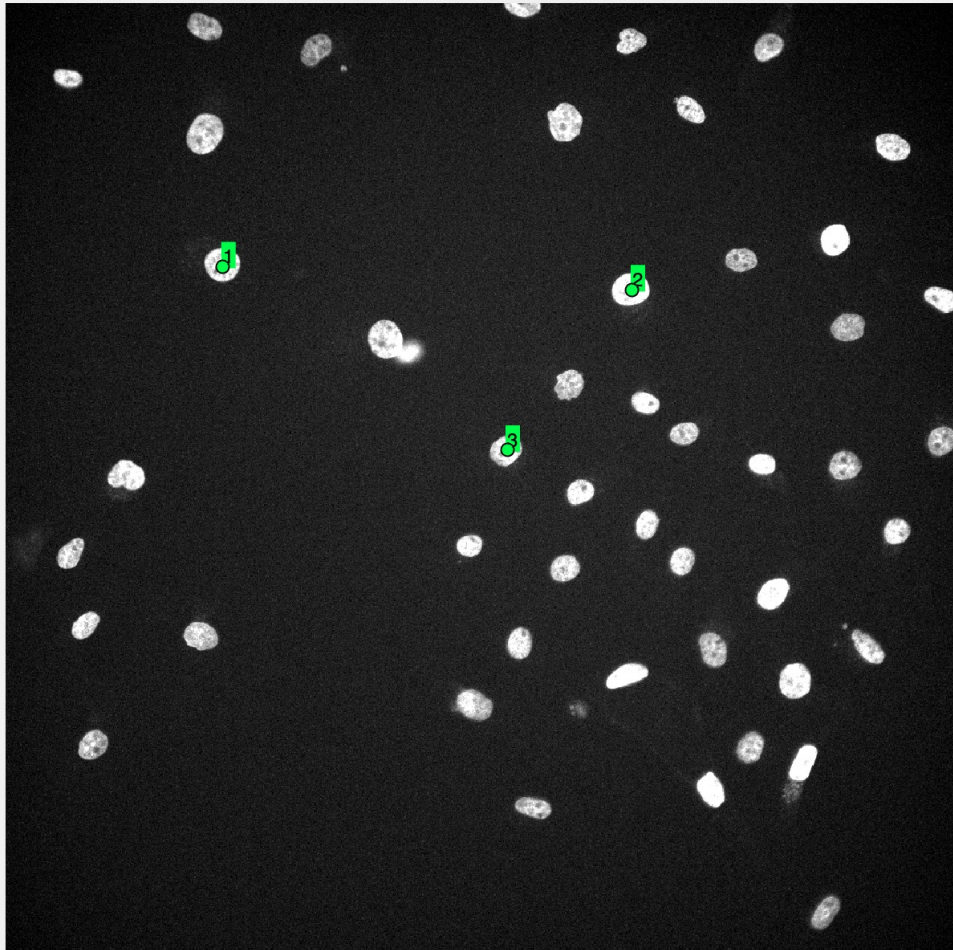
⏭

⏪

⏩

EXPORT

UI Figure



⏮

⏪

▶

⏸

⏭

⏩

⏮

12

13

14

II. Open MATLAB and run 'example_plot_h5.m'

The image displays the MATLAB R2022a - academic use interface. The main window shows the script 'example_plot_h5.m' being executed. The script contains the following code:

```
clear; close all; clc;

fpath = '/Users/heng/Dropbox/Macbook Pro/Projects/FOX1 project/Experiments/_Heng Softwa

%# LIST ALL DATASET IN FILE ".H5"
h5disp(fullfile(fpath, 'H5OUT_r4_c5.h5'), '/field1');

%# THE OUTPUT example: ...

%# LOAD 'OUTPUT SIGNAL' DATASET OF 'CHANNEL 1'
%# --- Note that there is a matrix of [ A x B x C ]
%# --- A = Cell ID
%# --- B = Timepoint
%# --- C = Parameters
h5data1 = h5read(fullfile(fpath, 'H5OUT_r4_c5.h5'), '/field1/out

%# LOAD 'OUTPUT SIGNAL' DATASET OF 'CHANNEL 2'
%# --- Note that there is a matrix of [ A x B x C ]
%# --- A = Cell ID
%# --- B = Timepoint
```

The Command Window shows the output of the script:

```
New to MATLAB? See resources for Getting Started.

HDF5 H5OUT_r4_c5.h5
Group '/field1'
Dataset 'cellpath'
Size: 3x2x10
MaxSize: 3x2x10
Datatype: H5T_IEEE_F64LE (double)
ChunkSize: 1x2x10
Filters: deflate(9)
```

The Workspace window shows the variables defined in the script:

Name	Value
fpath	'/Users/heng/Dr...
h5data1	3x10x24 double
h5data2	3x10x24 double
y	10x3 double

The Figure 1 window shows a line plot of the output signal. The x-axis represents time (1 to 10) and the y-axis represents the signal value (500 to 1100). The plot shows two data series (blue and orange) that remain relatively flat until time 8, where they both rise sharply to a peak of approximately 1050 at time 9, before slightly decreasing.

III. Description

A. Load images

- 1) Click load folder that containing images data set
- 2) Adjust the parameters in Columbus format
- 3) Change the timepoint to start ($t = 1$)

B. Adjust Threshold

- 4) Click to apply auto threshold for human eye observation
- 5) (Optional) Set 'on' (green color) to automatically adjust threshold on every frame

C. Add new object

- 6) Click manual to add a new single cell object
- 7) Select an single cell object to observe
- 8) Click to select the cell
- 9) Click 'OPT' to set center location of that cell

D. Track the cell

- 10) Click to start tracking and go to the next frame
- 11) After completed tracking, click 'RUN' for further analysis

E. Generate Mask (segmentation)

- 12) Select nuclear channel
- 13) Define all channels
- 14) click 'RUN' to start
- 15) Close the 'CellTracking Video' window

F. Save to H5

- 16) Click 'Save' and the h5 file will available at the images folder