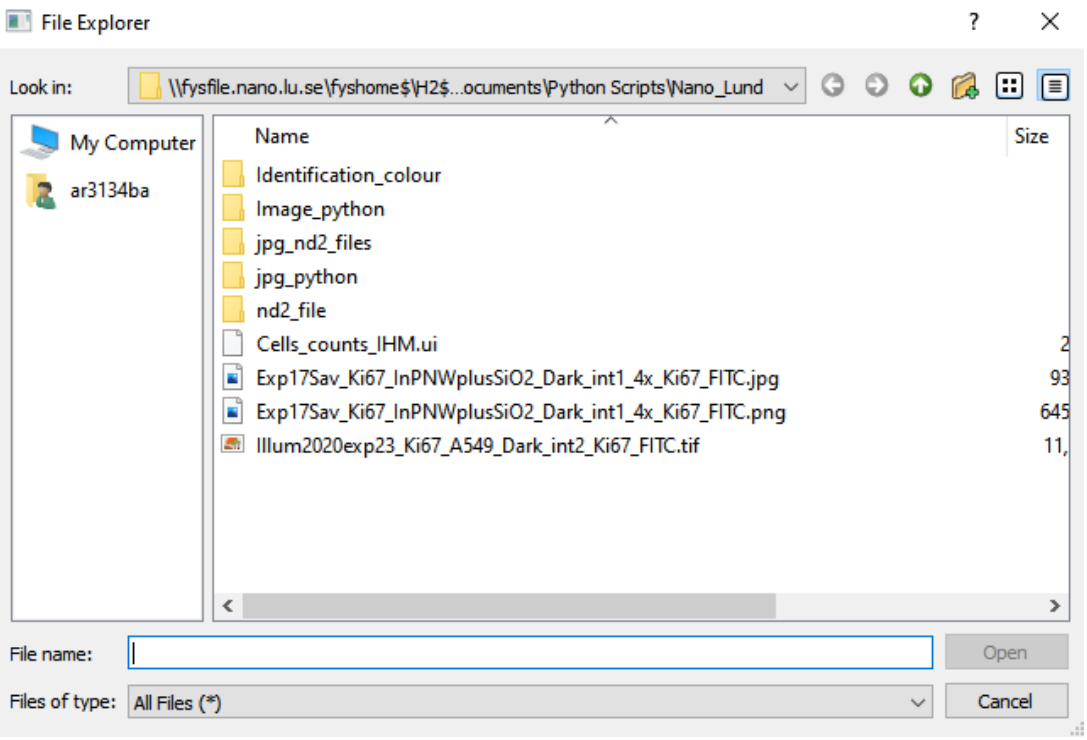
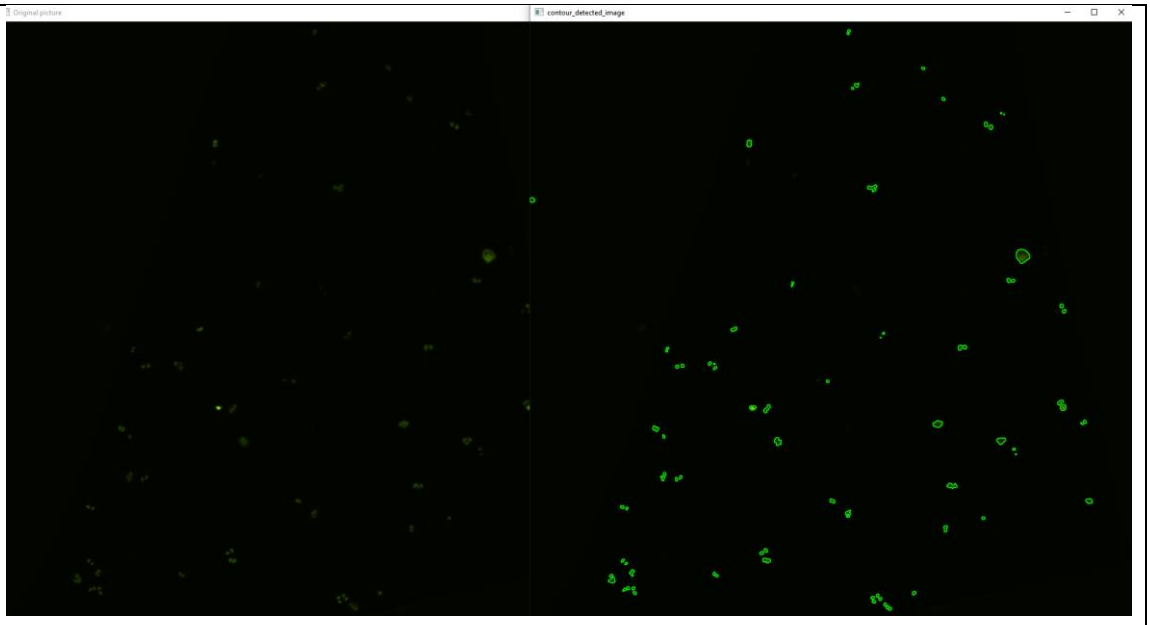
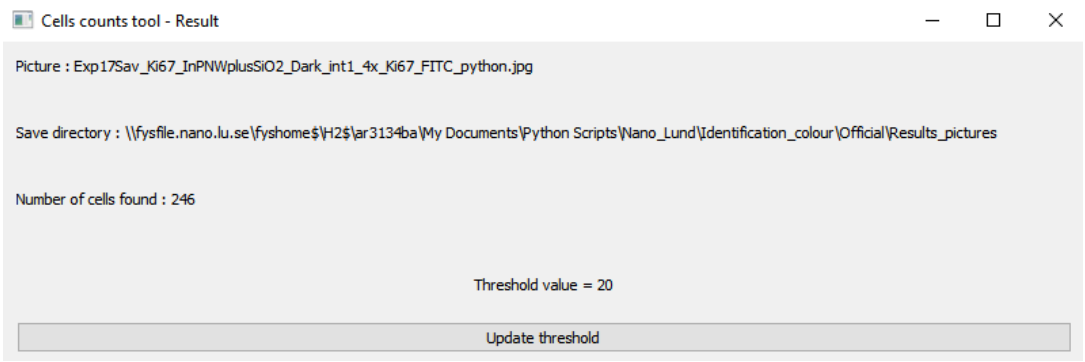
CELLS COUNT TOOL

USER MANUEL

ID TOOL:

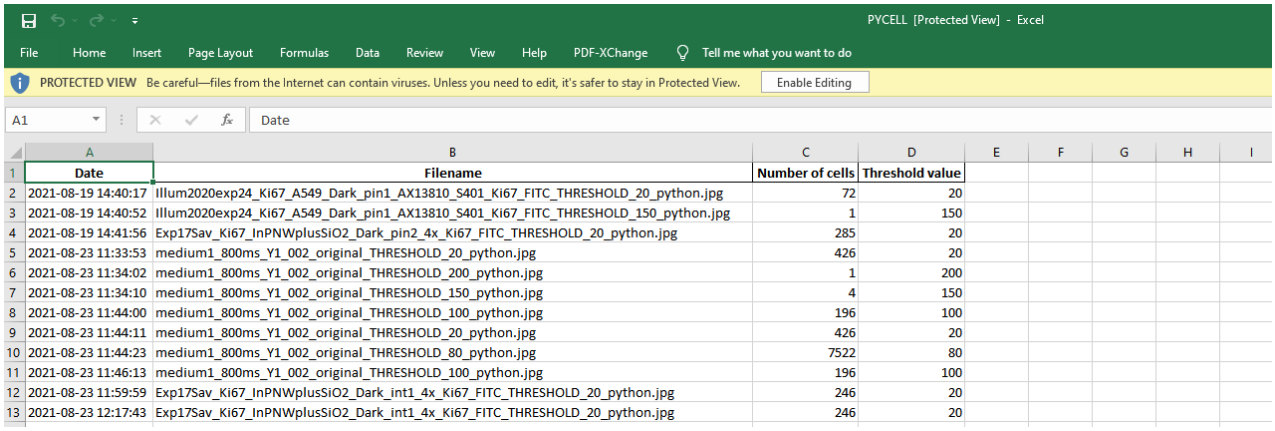
Python	v.3.8
Version	Cells_count_tool_1.2.py
Creation date	2021-08
Author	Arawinth Barthassarady
OS	Windows 10
Python environment	Download Anaconda: Anaconda | Individual Edition **Launch Spyder for run the script**
Package to download	Open the python prompt with anaconda->environment->base root (player button)-> open terminal Cv2: OpenCV-python · PyPI (pip install opencv-python)
GitHub	You can download the tool at this address: https://github.com/ArawinthB/Cells_count_tool (**Code**->Download Zip)
Goal	This tool was created for the posttreatment analyze of cells pictures. With an input file type .jpg/.png/.tiff from a Nikon microscope, you will be able to use this tool to count each cell in a picture.
Input format	.jpg/.png/.tiff (don't work with nd2 file, you can use ImageJ to convert .nd2 in .jpg)
Output	- Results pictures folder - PYCELL.xlsx file, all the results are saved in this one
Script details	Python detail

Home Page	 "Load a file": This button will open your file explorer. You have to select which picture you want to study.
File explorer	 Allowed format picture are: **.jpg**, **.png**, **.tiff**

Results pictures	 Left picture is the original picture. Name of the windows : “**Original picture**”. Right picture is the python analyze and detection of cell. Name of the windows : “**contour_detected_image**”. With this method you can compare the both pictures and knows if python did a quality detection or not. Whatever, you can close the two windows to acces to result page. The right picture is automatically save in “Results pictures” folder. This folder is create in the same path of your Cells_count_tool.py script.
Second page Results	 “Picture” : Name of the python picture “Save directory” : Location of the save python picture “Number of cells found” : The results depend the threshold value “Update threshold”: This button offers to user the possibility to adapt the threshold value. All these information is saved in a new excel file call “PYCELL.xlsx”. This one is created automatically for save all the data.

ANNEXE A

- PYCELL.xlsx



	A	B	C	D	E	F	G	H	I
1	**Date**	**Filename**	**Number of cells**	**Threshold value**					
2	2021-08-19 14:40:17	Illum2020exp24_Ki67_A549_Dark_pin1_AX13810_S401_Ki67_FITC_THRESHOLD_20_python.jpg	72	20					
3	2021-08-19 14:40:52	Illum2020exp24_Ki67_A549_Dark_pin1_AX13810_S401_Ki67_FITC_THRESHOLD_150_python.jpg	1	150					
4	2021-08-19 14:41:56	Exp17Sav_Ki67_InPNWplusSiO2_Dark_pin2_4x_Ki67_FITC_THRESHOLD_20_python.jpg	285	20					
5	2021-08-23 11:33:53	medium1_800ms_Y1_002_original_THRESHOLD_20_python.jpg	426	20					
6	2021-08-23 11:34:02	medium1_800ms_Y1_002_original_THRESHOLD_200_python.jpg	1	200					
7	2021-08-23 11:34:10	medium1_800ms_Y1_002_original_THRESHOLD_150_python.jpg	4	150					
8	2021-08-23 11:44:00	medium1_800ms_Y1_002_original_THRESHOLD_100_python.jpg	196	100					
9	2021-08-23 11:44:11	medium1_800ms_Y1_002_original_THRESHOLD_20_python.jpg	426	20					
10	2021-08-23 11:44:23	medium1_800ms_Y1_002_original_THRESHOLD_80_python.jpg	7522	80					
11	2021-08-23 11:46:13	medium1_800ms_Y1_002_original_THRESHOLD_100_python.jpg	196	100					
12	2021-08-23 11:59:59	Exp17Sav_Ki67_InPNWplusSiO2_Dark_int1_4x_Ki67_FITC_THRESHOLD_20_python.jpg	246	20					
13	2021-08-23 12:17:43	Exp17Sav_Ki67_InPNWplusSiO2_Dark_int1_4x_Ki67_FITC_THRESHOLD_20_python.jpg	246	20					

ANNEXE B

- Python script

Library

```
# -*- coding: utf-8 -*-
"""
Created on Thu Aug  5 11:45:11 2021

@author: ar3134ba
"""

import sys
from PyQt5.QtWidgets import QApplication, QInputDialog, QWidget, QPushButton, QVBoxLayout, QLabel, QFileDialog
from PyQt5.QtGui import QIcon, QPixmap, QFont
from PyQt5.QtCore import Qt
import cv2
import os, glob
import datetime
import pandas as pd
from openpyxl import load_workbook
```

PyQt5: Python binding of the cross-platform GUI toolkit Qt, implemented as a Python plug-in. PyQt5 · PyPI.

Cv2: Computer vision 2 (cv2) is a module of OpenCV. Open source software library for computer vision and machine learning. opencv-python · PyPI

Datetime: Library use for change the date format. DateTime · PyPI

Pandas: Data analysis library. pandas · PyPI

Openpyxl: library to read/write Excel 2010 xlsx/xlsm/xltx/xltm files. openpyxl · PyPI

- Python script

Class

Cells_count_tool_1.1.py is composed by three class:

1. Class Cells_counts
2. Class Homepage
3. Class Second_Windows

Classes provide a means of bundling data and functionality together.

1. Class Cells_count		
	Functions	Variable
Input	Cells_detection	File Threshold
	Save_xlsx	Threshold
Output	Cells_detection	Number of cells count Threshold value Pictures
	Save_xlsx	Excel file

Class Homepage & class Second_Windows are here to build the graphical user interface (GUI). They call the class Cells_count to do the picture analysis and save data.