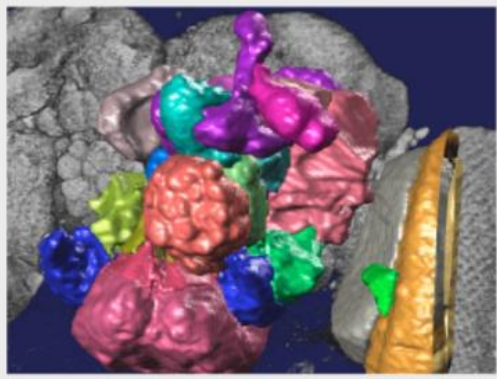


# **Learn to use Vaa3D plugins**

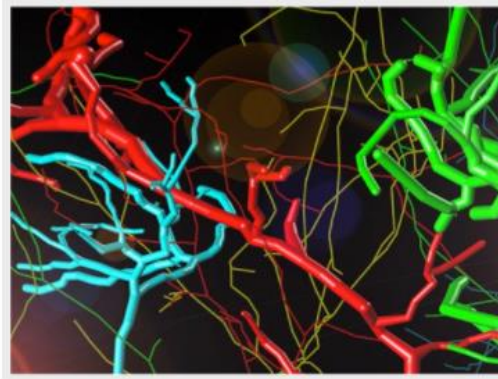
# Introduction

'Vaa3D' is short for the “3D Visualization-Assisted Analysis” software suite and is cross-platform (Mac, Linux, and Windows).



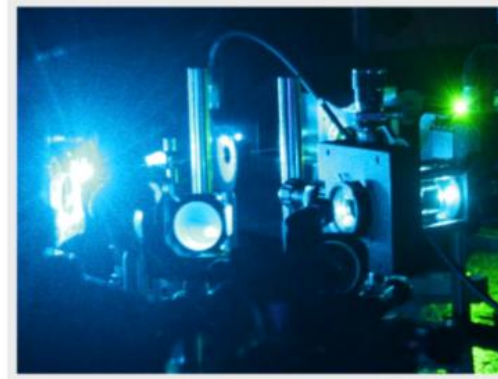
## FAST

Vaa3D visualizes and explores big 3D/4D/5D images with giga-voxels and even tera-voxels, within seconds or sub-seconds!



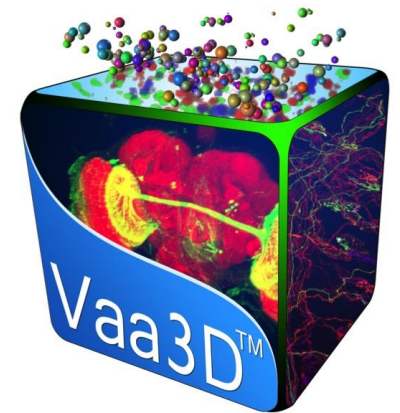
## COOL

Vaa3D extracts complex surface objects from images, and performs comprehensive analyses such as brain connectome mapping.



## EXTENSIBLE

100+ plugins for image acquisition, microsurgery, data management and analysis, and massive-scale pipelining.



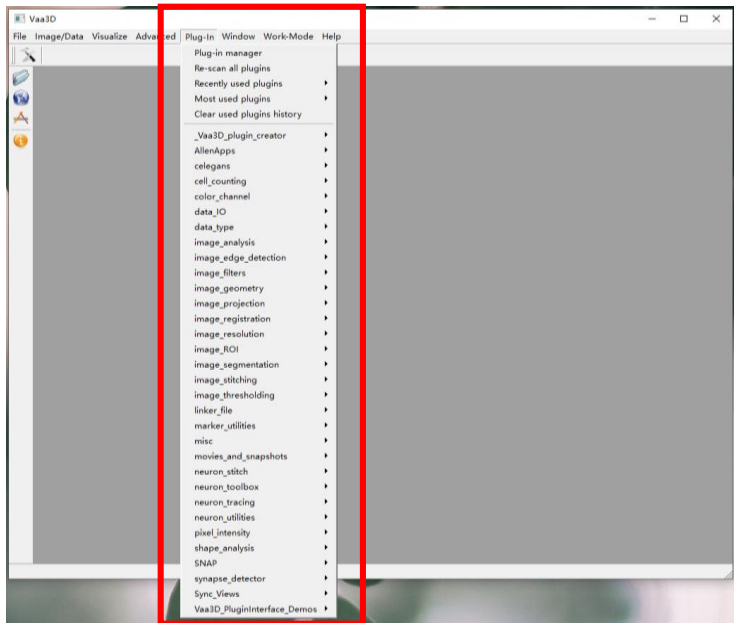
# Vaa3D plugins

Vaa3D plugins are programs you can develop to take advantage of the management, visualization and analysis tools of Vaa3D.

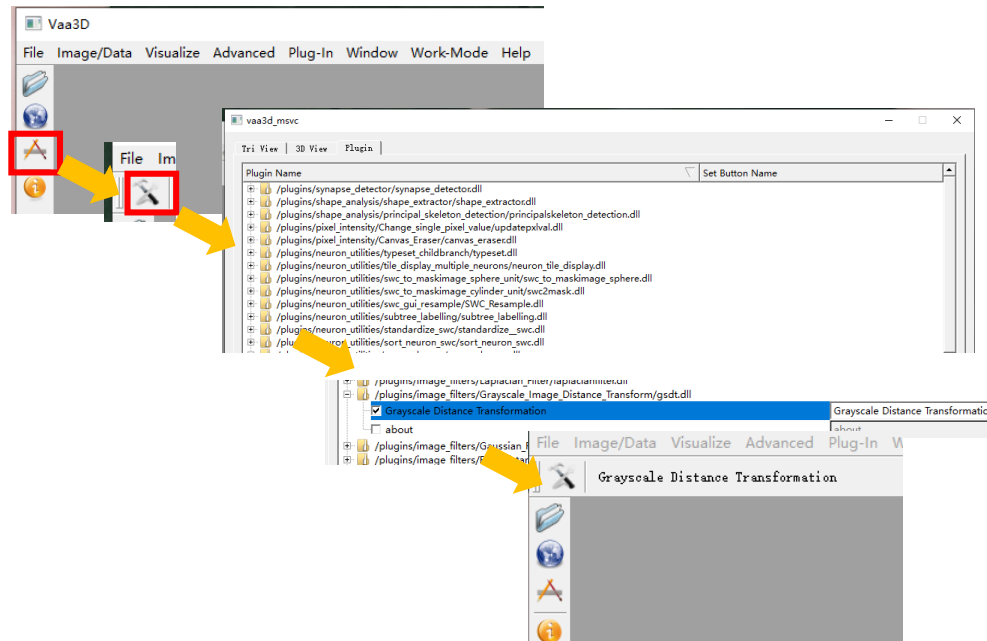
- analyzing 3D images, writing output to files;
- visualizing images and surface objects in user-defined way;
- extending Vaa3D functions (e.g. for tera-bytes of large data)
- taking advantage of the fast volume image rendering, 3D pinpointing, and easy 4D image data management of Vaa3D;

? Where can we find these plugins

1



2

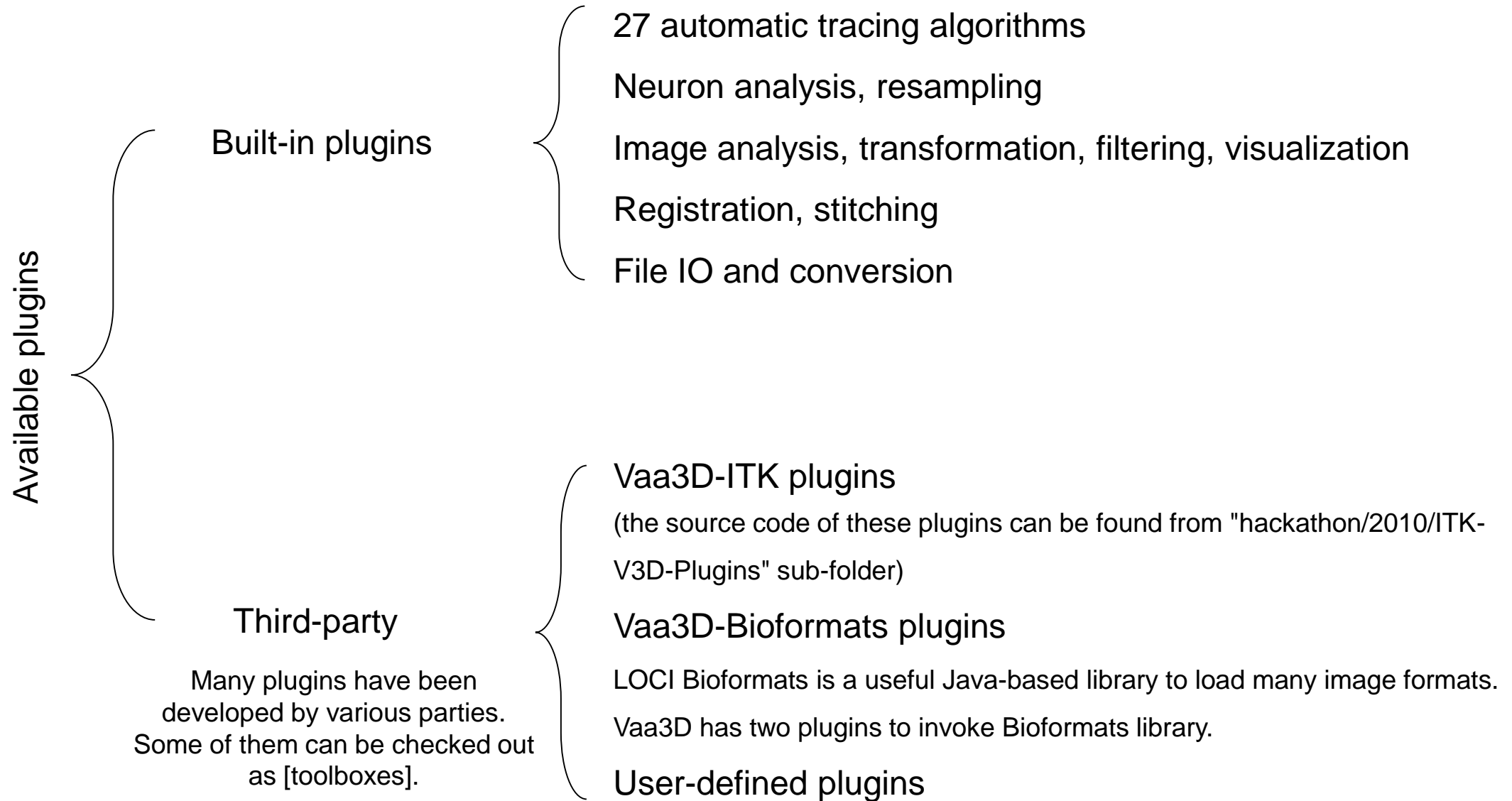


3 On command line console

vaa3d\_msvc.exe /h (Windows)

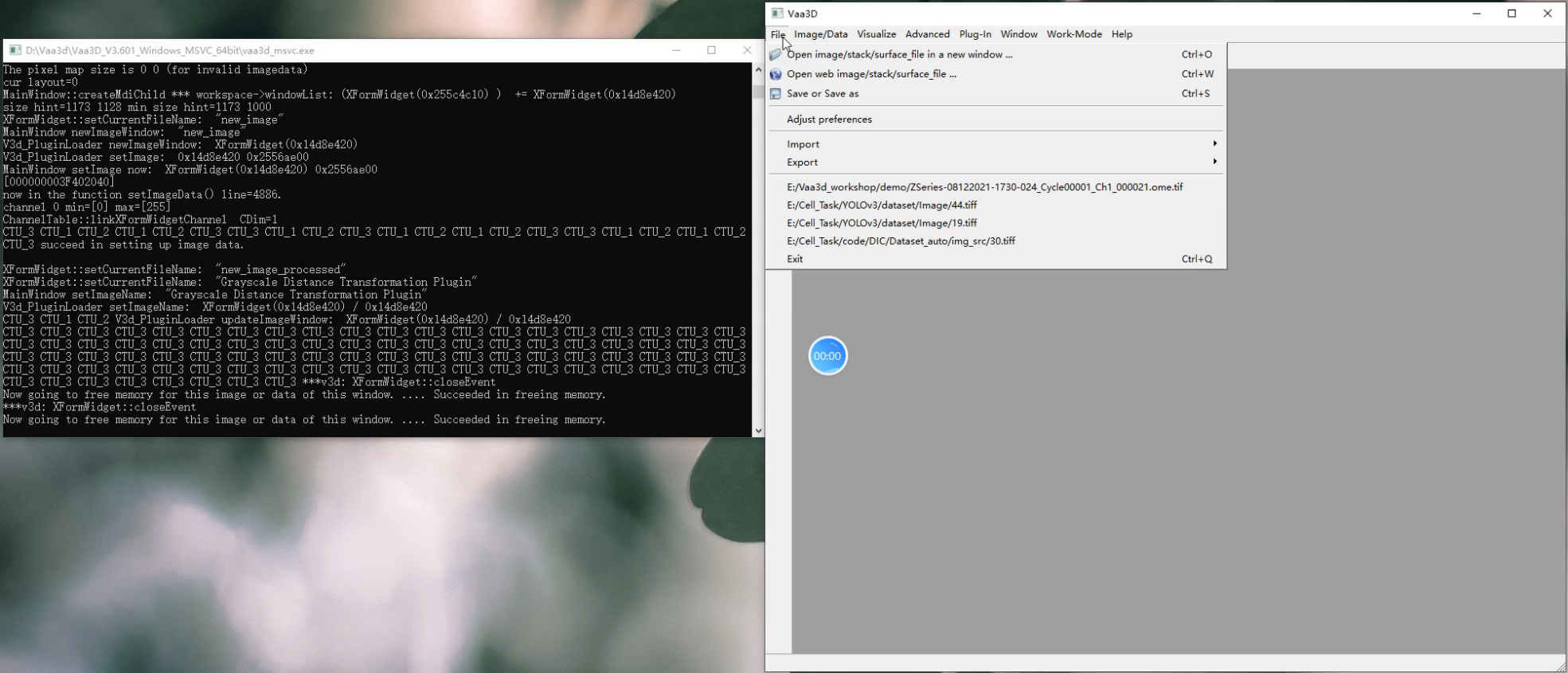
vaa3d\_msvc.exe /h /x <plugin\_name>

# Vaa3D plugins

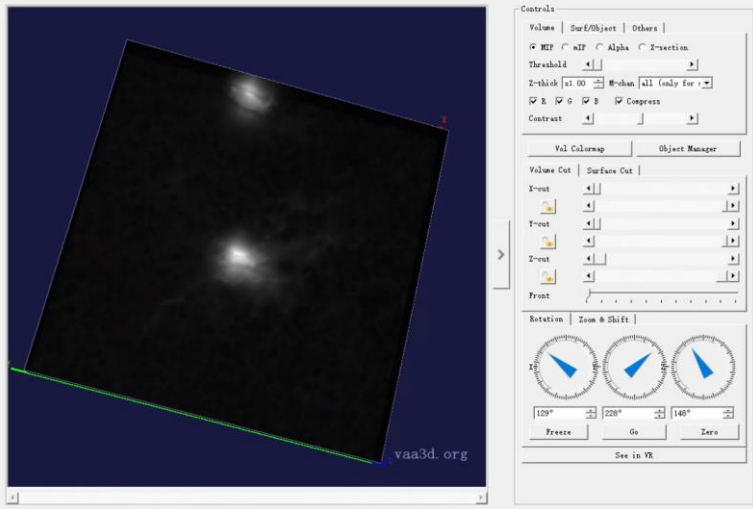
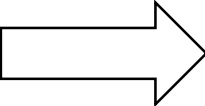
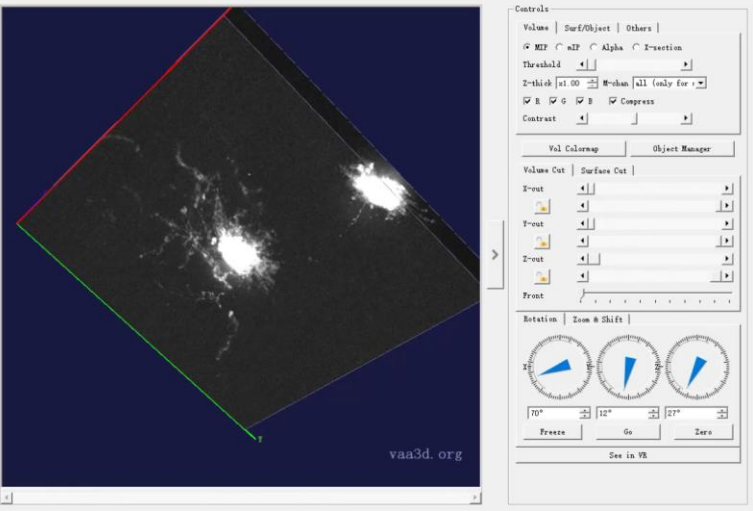


# Use a Plug-in

## Grayscale Distance Transformation Plug-in



# Use a Plug-in



# Write a Plug-in

---

## Environment preparation

1. Qt. Download at <http://qt.nokia.com/products/> if you don't have on your system.
2. Check out Vaa3D source code from the page <http://vaa3d.org>.
3. a c++ compiler.

## The structure of a Vaa3D plugin project

It contains a list of at least 3 files:

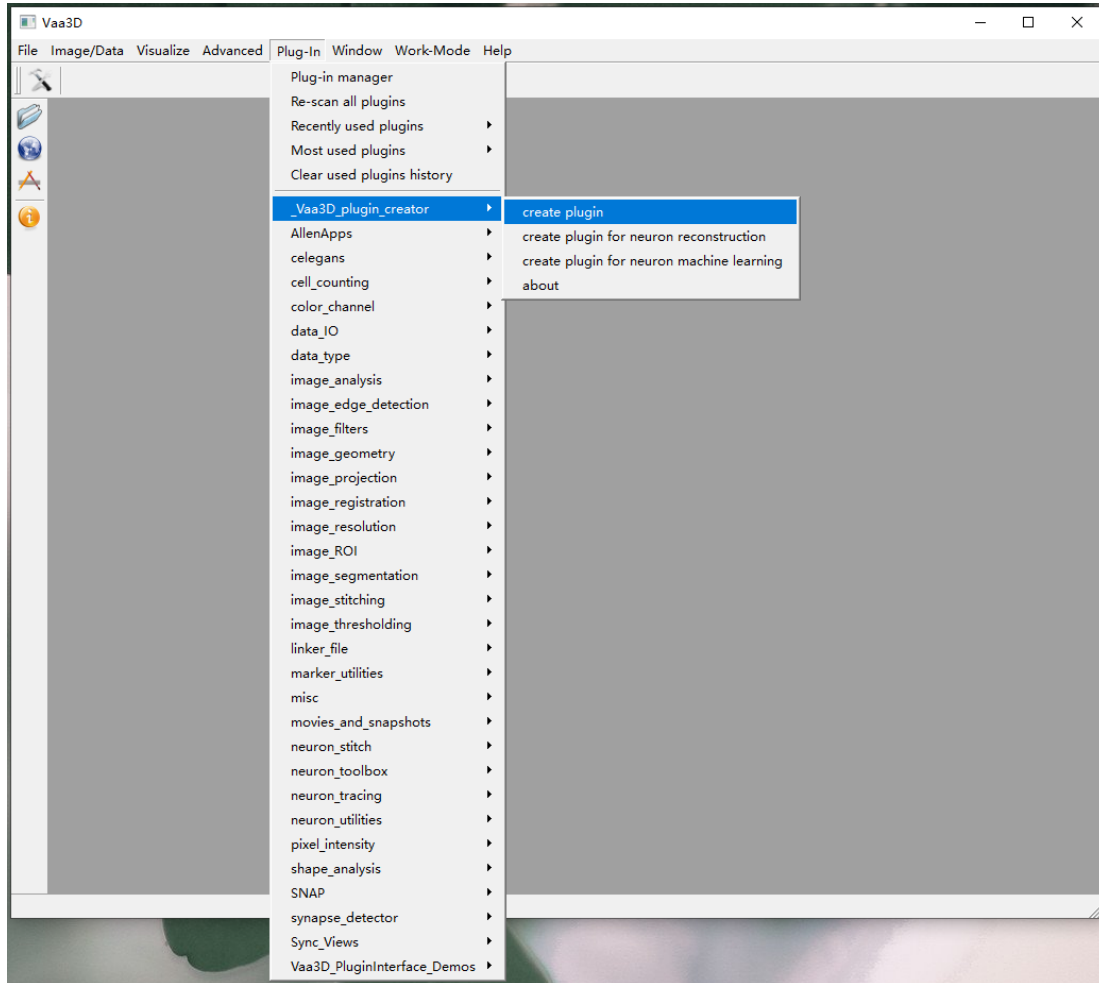
plugin.h

plugin.cpp

plugin.pro

plugin.pro tells Qt how to compile to plugin. The header file and .cpp file organize the major functions that are used by the plugin interface.

# Write a Plug-in

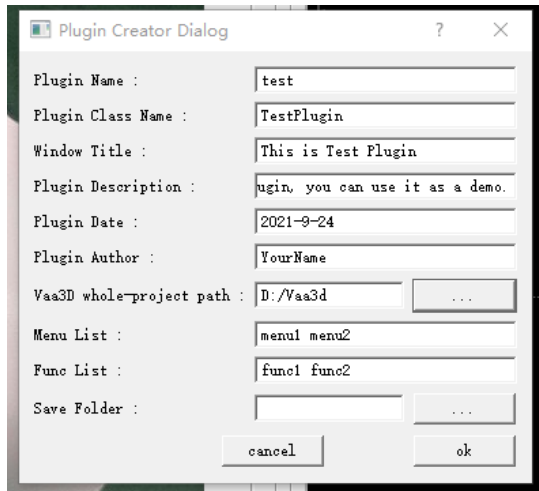


## Plugin Creator: a simple way to create a plugin

For beginners who are not familiar with the coding styles of Vaa3D plugins, an easy way to create a Vaa3D plugin is to use another plugin called **Plugin Creator**, which provides basic template and examples for you to customize your plugin. The Plugin Creator is now available in [Existing Plugin List](#).



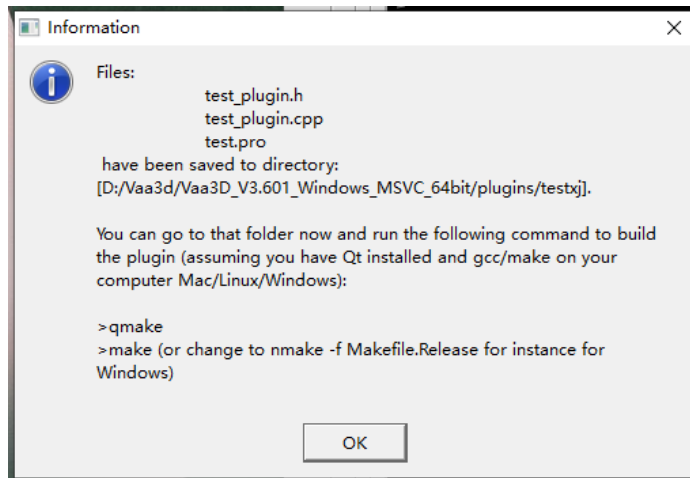
# Write a Plug-in



This can provide basic template and examples for us to customize our own plugin

> 本地磁盘 (D:) > Vaa3d > Vaa3D\_V3.601\_Windows\_MSVC\_64bit > plugins > testxj

名称	修改日期	类型	大小
test.pro	2021/9/24 0:38	PRO 文件	1 KB
*+ test_plugin.cpp	2021/9/24 0:38	C++ Source	2 KB
test_plugin.h	2021/9/24 0:38	C/C++ Header	1 KB



Once we have built the necessary template of a plugin (either by Plugin Creator or manually), we can move on to add our own functions in it

An example plugin can be found at [https://github.com/Vaa3D/Vaa3D\\_Wiki/wiki/PluginDesignGuide.wiki](https://github.com/Vaa3D/Vaa3D_Wiki/wiki/PluginDesignGuide.wiki)

# Write a Plug-in

After adding our own functions,  
make sure the paths are correct

```
TEMPLATE    = lib
CONFIG     += qt plugin warn_off
#CONFIG    += x86_64
VAA3DPATH  = E:/Vaa3d_workshop/vaa3d_xj/v3d_external/v3d_main
INCLUDEPATH += $$VAA3DPATH/basic_c_fun

#include necessary paths
#includepath += $$V3DMAINPATH/basic_c_fun
#includepath += $$VAA3DPATH/common_lib/include
LIBS += -L$$VAA3DPATH/common_lib/winlib64 -llibtiff

#include the headers used in the project
HEADERS = test1118_plugin.h
HEADERS += example_func.h
SOURCES += test1118_plugin.cpp
SOURCES += example_func.cpp
SOURCES += $$VAA3DPATH/basic_c_fun/v3d_message.cpp
SOURCES += $$VAA3DPATH/basic_c_fun/stackutil.cpp
SOURCES += $$VAA3DPATH/basic_c_fun/mg_image_lib.cpp
SOURCES += $$VAA3DPATH/basic_c_fun/mg_utilities.cpp
SOURCES += $$VAA3DPATH/basic_c_fun/basic_memory.cpp

#specify target name and directory
TARGET = $$qtLibraryTarget(test1118)
DESTDIR = $$VAA3DPATH/bin/plugins/test1118/
```

If you compile the example plugin at

[https://github.com/Vaa3D/Vaa3D\\_Wiki/wiki/PluginDesignGuide.wiki](https://github.com/Vaa3D/Vaa3D_Wiki/wiki/PluginDesignGuide.wiki)

You may encounter this error

```
link /LIBPATH:"d:\Qt\4.8.6\lib" /NOLOGO /DYNAMICBASE /NXCOMPAT /INCREMENTAL:NO /DLL /OUT:..\..\..\v3d_external\v3d_main\bin\pl
ugins\test1118\test1118.dll @C:\Users\user\AppData\Local\Temp\nm8285.tmp
LINK : fatal error LNK1181: cannot open input file 'v3dtiff.lib'
NMAKE : fatal error U1077: '"D:\Microsoft Visual Studio\2013\VC\BIN\amd64\link.EXE"' : return code '0x49d'
Stop.
```

just replace the LIBS line as the red box, then you can successfully  
compile it

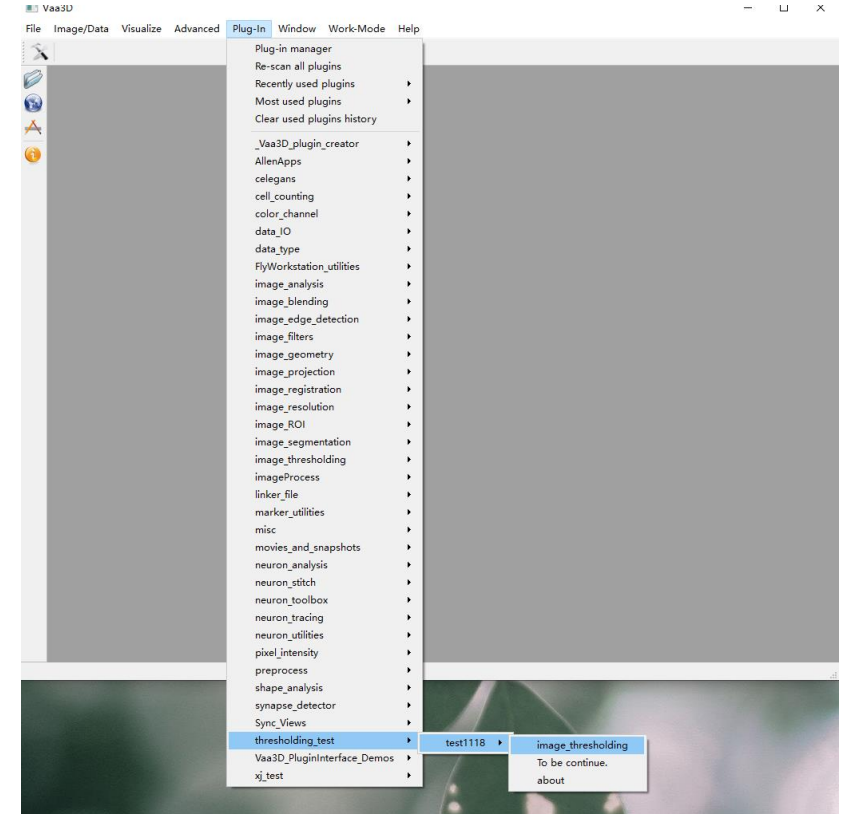
# Write a Plug-in

```
E:\Vaa3d_workshop\vaa3d_xj\vaa3d_tools\bin\plugins\xj_test>qmake test1118.pro
E:\Vaa3d_workshop\vaa3d_xj\vaa3d_tools\bin\plugins\xj_test>rmake -f Makefile.Release

Microsoft (R) Program Maintenance Utility Version 12.00.21005.1
Copyright (C) Microsoft Corporation. All rights reserved.

D:\Qt\4.8.6\bin\moc.exe -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB -DQT_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_3
DNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDDEBUG -I"d:\Qt\4.8.6\include\QtCore" -I"d:\Qt\4.8.6\include\QtG
ui" -I"d:\Qt\4.8.6\include\QtGui" -I"..\..\..\v3d_external\v3d_main\basic_c_fun" -I"..\..\..\v3d_external\v3d_main\common_lib\include" -I
"d:\Qt\4.8.6\include\ActiveQt" -I release -I"d:\Qt\4.8.6\mkspecs\win32-msvc2013" -D_MSC_VER=1800 -DWIN32 test1118_plugin.h -o release\mo
c_test1118_plugin.cpp
g++ -c -nologo -Zm200 -Zc:wchar_t -FS -O2 -MD -W0 -GR -EHsc -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB -DQ
T_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_3DNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDDEBUG -I"d:\Qt\4.8.6\inclu
e\QtCore" -I"d:\Qt\4.8.6\include\QtGui" -I"d:\Qt\4.8.6\include\QtGui" -I"..\..\..\v3d_external\v3d_main\basic_c_fun" -I"..\..\..\v3d_exte
rnal\v3d_main\common_lib\include" -I"d:\Qt\4.8.6\include\ActiveQt" -I release -I"d:\Qt\4.8.6\mkspecs\win32-msvc2013" -Forelease @C:\Use
rs\user\AppData\Local\Temp\rm77BA.tmp
test1118_plugin.cpp
example_func.cpp
Generating Code...
g++ -c -nologo -Zm200 -Zc:wchar_t -FS -O2 -MD -W0 -GR -EHsc -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB -DQ
T_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_3DNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDDEBUG -I"d:\Qt\4.8.6\inclu
e\QtCore" -I"d:\Qt\4.8.6\include\QtGui" -I"d:\Qt\4.8.6\include\QtGui" -I"..\..\..\v3d_external\v3d_main\basic_c_fun" -I"..\..\..\v3d_exte
rnal\v3d_main\common_lib\include" -I"d:\Qt\4.8.6\include\ActiveQt" -I release -I"d:\Qt\4.8.6\mkspecs\win32-msvc2013" -Forelease @C:\Use
rs\user\AppData\Local\Temp\rm8027.tmp
v3d_message.cpp
stackutil.cpp
mg_image_lib.cpp
mg_utilities.cpp
Generating Code...
g++ -c -nologo -Zm200 -Zc:wchar_t -FS -O2 -MD -W0 -GR -EHsc -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB -DQ
T_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_3DNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDDEBUG -I"d:\Qt\4.8.6\inclu
e\QtCore" -I"d:\Qt\4.8.6\include\QtGui" -I"d:\Qt\4.8.6\include\QtGui" -I"..\..\..\v3d_external\v3d_main\basic_c_fun" -I"..\..\..\v3d_exte
rnal\v3d_main\common_lib\include" -I"d:\Qt\4.8.6\include\ActiveQt" -I release -I"d:\Qt\4.8.6\mkspecs\win32-msvc2013" -Forelease @C:\Use
rs\user\AppData\Local\Temp\rm86B0.tmp
moc_test1118_plugin.cpp
link /LIBPATH:d:\Qt\4.8.6\lib" /NOLOGO /DYNAMICBASE /NXCOMPAT /INCREMENTAL:NO /DLL /OUT:..\..\..\v3d_external\v3d_main\bin\pl
ugins\test1118\test1118.dll @C:\Users\user\AppData\Local\Temp\rm99BE.tmp
Creating library ..\..\..\v3d_external\v3d_main\bin\plugins\test1118\test1118.lib and object ..\..\..\v3d_external\v3d_main\bin\
plugins\test1118\test1118.exp
```

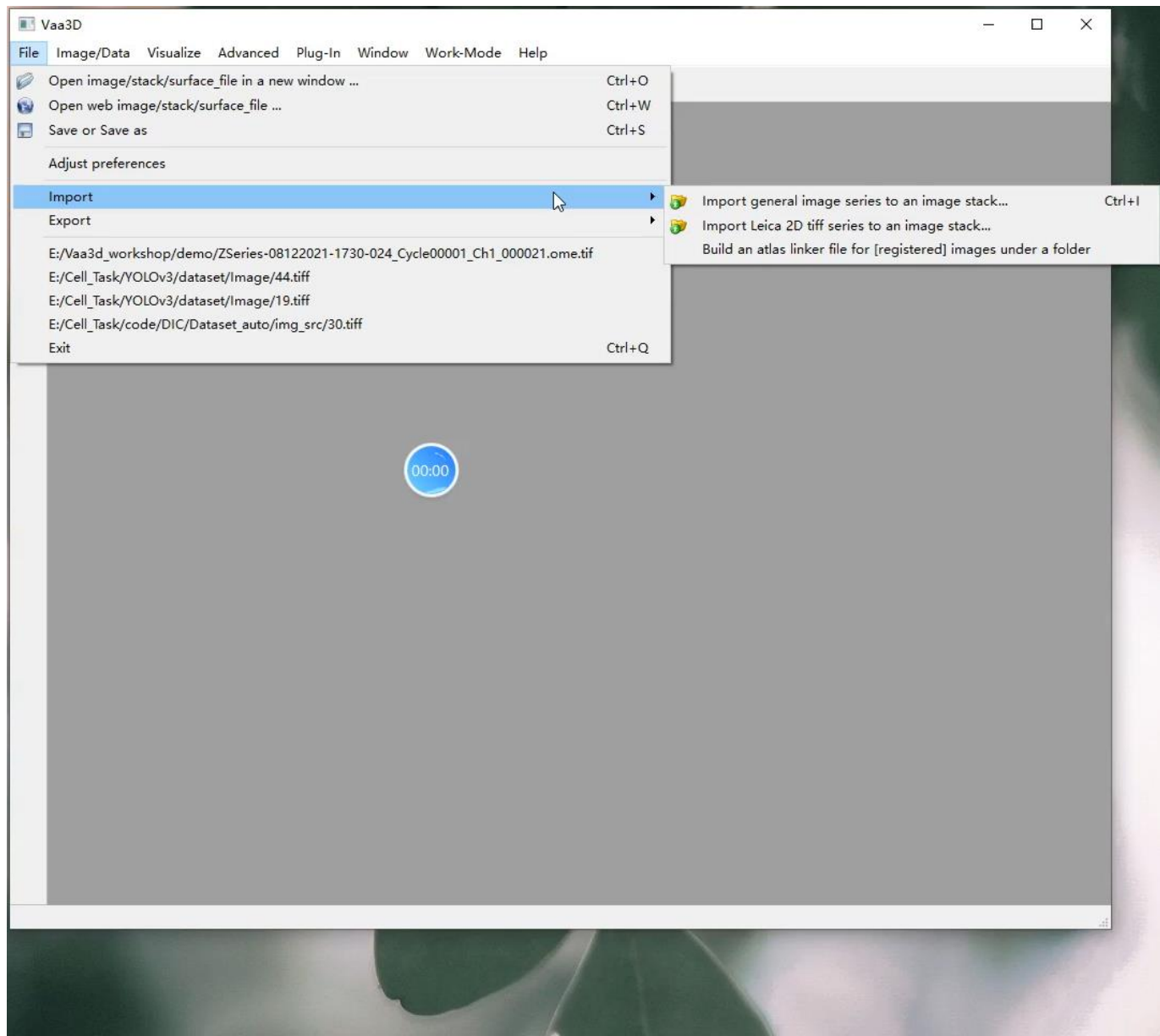
Run vaa3d, we can find the plugin has appeared in the menu



E:\Vaa3d\_workshop\vaa3d\_xj\v3d\_external\bin\plugins\test1118\

File Name	Created	Description	Size
test1118.dll	2021/11/18 17:38	应用程序扩展	414 KB
test1118.dll.manifest	2021/11/18 17:38	MANIFEST 文件	1 KB
test1118.exp	2021/11/18 17:38	Exports Library ...	1 KB
test1118.lib	2021/11/18 17:38	Object File Library	3 KB

# Write a Plug-in



**Thank you for listening**