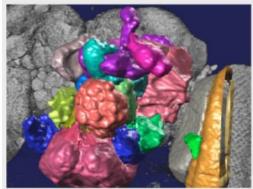
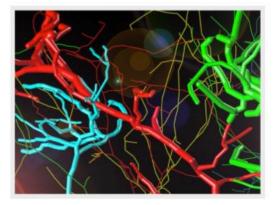
Learn to use Vaa3D plugins

Introduction

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







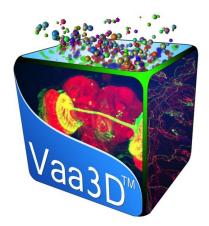
Vaa3D visualizes and explores big 3D/4D/5D images with giga-voxels and even tera-voxels, within seconds or sub-seconds!

FAST

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.

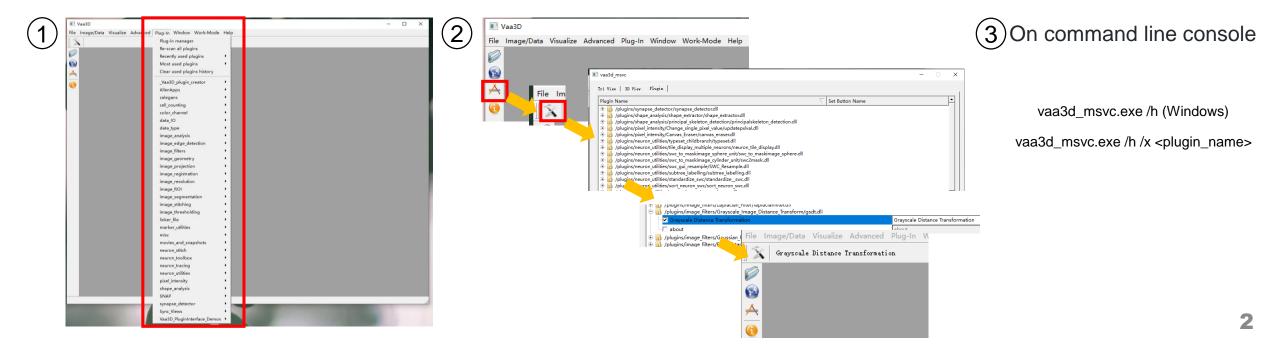


Vaa3D plugins

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;

$\ensuremath{\mathfrak{P}}$ Where can we find these plugins



Vaa3D plugins

Available plugins

Built-in plugins

Third-party

Many plugins have been developed by various parties. Some of them can be checked out as [toolboxes]. 27 automatic tracing algorithms

Neuron analysis, resampling

Image analysis, transformation, filtering, visualization

Registration, stitching

File IO and conversion

Vaa3D-ITK plugins

(the source code of these plugins can be found from "hackathon/2010/ITK-V3D-Plugins" sub-folder)

Vaa3D-Bioformats plugins

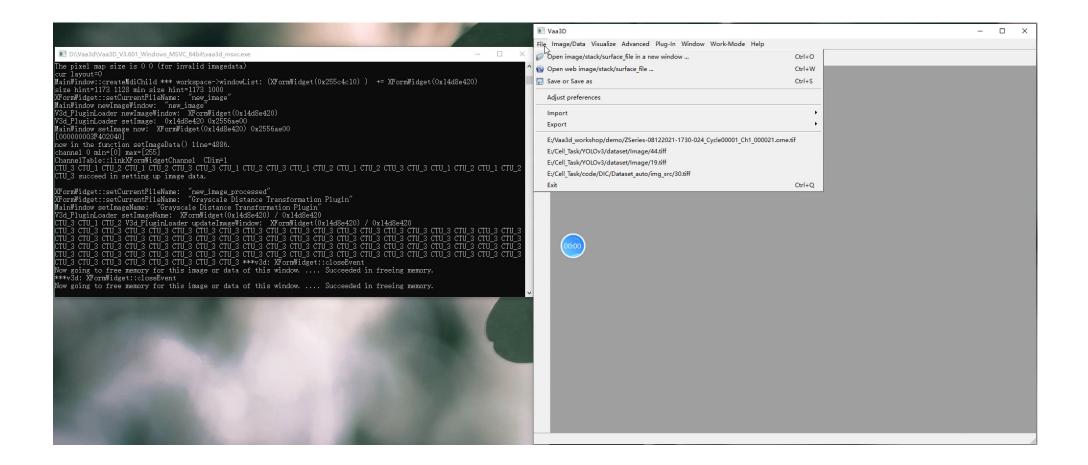
LOCI Bioformats is a useful Java-based library to load many image formats.

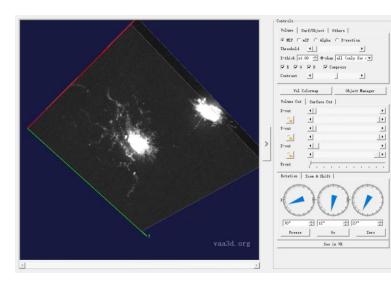
Vaa3D has two plugins to invoke Bioformats library.

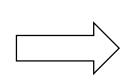
User-defined plugins

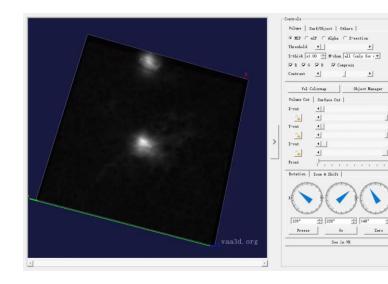
Use a Plug-in

Grayscale Distance Transformation Plug-in









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Environment preparation

1. Qt. Download at <u>http://qt.nokia.com/products/</u> if you don't have on your system.

2. Check out Vaa3D source code from the page <u>http://vaa3d.org</u>.

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.

Vaa3D				-	×
e Image/Data Visualize Advanced	Plug-In Window Work-Mode	Help)		
X	Plug-in manager				
	Re-scan all plugins				
>	Recently used plugins	→			
	Most used plugins	•			
	Clear used plugins history				
	_Vaa3D_plugin_creator	•	create plugin		
	AllenApps	•	create plugin for neuron reconstruction		
	celegans	•	create plugin for neuron machine learning		
	cell_counting	•	about		
	color_channel	• 1			
	data_IO	•			
	data_type	+			
	image_analysis	→			
	image_edge_detection	- F			
	image_filters	+			
	image_geometry	→			
	image_projection	+			
	image_registration	→			
	image_resolution	- F			
	image_ROI	- F			
	image_segmentation	•			
	image_stitching	→			
	image thresholding				
	linker_file	+			
	 marker_utilities				
	misc	+			
	movies_and_snapshots	•			
	neuron_stitch	•			
	neuron_toolbox	•			
	neuron tracing	•			
	neuron_utilities	,			
	pixel intensity	,			
	shape_analysis				
	SNAP				
	synapse_detector				
	Sync_Views				
4	Vaa3D_PluginInterface_Demos				

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 <u>Existing Plugin List</u>.

Plugin Creator Dialog	? ×
Plugin Name :	test
Plugin Class Name :	TestPlugin
Window Title :	This is Test Plugin
Plugin Description :	ugin, you can use it as a demo.
Plugin Date :	2021-9-24
Plugin Author :	YourName
Vaa3D whole-project path :	D:/Vaa3d
Menu List :	menul menu2
Func List :	func1 func2
Save Folder :	
	cancel ok
_	

the plugin (assuming you have Qt installed and gcc/make on your computer Mac/Linux/Windows): >qmake >make (or change to nmake -f Makefile.Release for instance for	1	Files: test_plugin.h test_plugin.cpp test.pro have been saved to directory: [D:/Vaa3d/Vaa3D_V3.601_Windows_MSVC_64bit/plugins/testxj]. You can go to that folder now and run the following command to build
Windows)		the plugin (assuming you have Qt installed and gcc/make on your computer Mac/Linux/Windows): >qmake

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			
へ 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/PluginDesignG uide.wiki

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/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 You may encounter this error

link /LIBPATH:"d:\Qt\4.8.6\lib" /NOLOGO /DYNAMICBASE /NXCOMPAT /INCREMENTAL:NO /DLL /OUT:..\..\v.3d_external\v3d_main\bin\p gins\test1118\test1118.dl1 @C:\Users\user\AppData\Local\Temp\nm8285.tmp INK_: fatal error LNK1181: cannot open input file 'v3dtiff.1ib'

MAKE : fatal error U1077: '"D:\Microsoft Visual Studio\2013\VC\BIN\amd64\link.EXE"' : return code '0x49d'

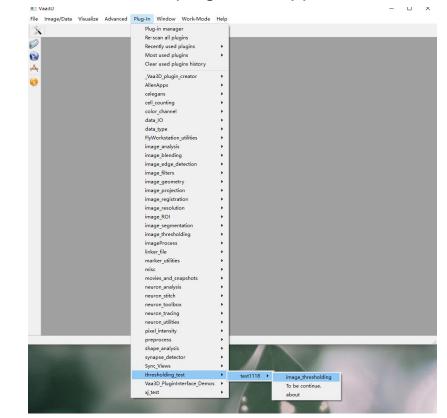
just replace the LIBS line as the red box, then you can successfully compile it

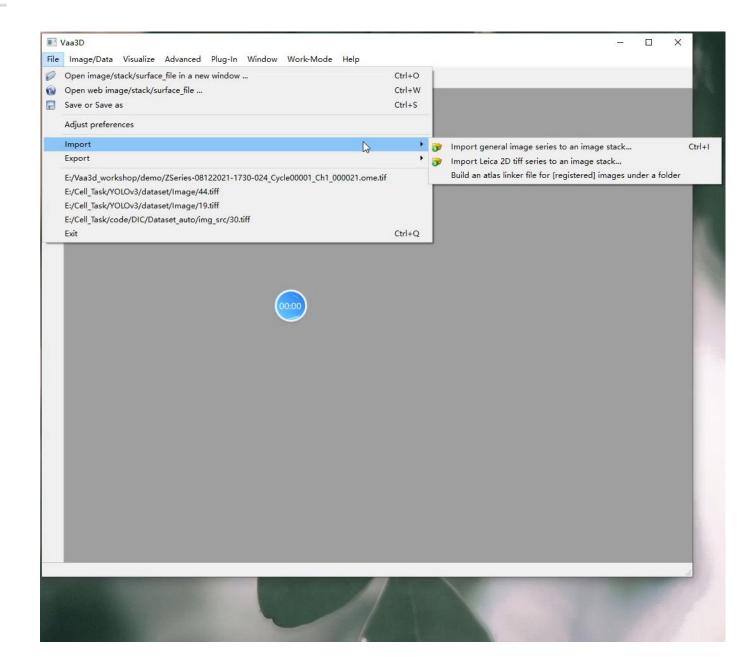
E:\Vaa3d_workshop\vaa3d_xj\vaa3d_tools\bin\plugins\xj_test>qmake test1118.pro
E:\Vaa3d_workshop\vaa3d_xj\vaa3d_tools\bin\plugins\xj_test>nmake -f Makefile.Release
Microsoft (R) Program Maintenance Utility Version 12.00.21005.1 Copyright (C) Microsoft Corporation. All rights reserved.
D:\Qt\4.8.6\bin\moc.exe -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB -DQT_CORE_LIB -DQT_HAVE_MMX -DQT_HAV DNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDEBUG -I"d:\Qt\4.8.6\include\QtCore" -I"d:\Qt\4.8.6\include` ui" -I"d:\Qt\4.8.6\include` -I"\\\v3d_external\v3d_main\basic_c_fum" -I"\\\v3d_external\v3d_main\common_lib\include "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 (c test1118 plugin.cpp
ci -co-mologo -Zn200 -Zc:wchar tr -FS -O2 -MD -WO -GR -EHsc -DUNICODE -DWINS2 -DQT DLL -DQT NO DEBUG -DQT PLUGIN -DQT GUL LIB T_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_SDNOW -DQT_HAVE_SES -DQT_HAVE_MIXEXT -DQT_HAVE_SSE2 -DQT_IHREAD_SUPFORT -DNDEBUG -I'.d:\Qt\4.8.6\include e\QtCore -I'd:\Qt\4.8.6\include\QtQui' -I'd:\Qt\4.8.6\include\ActiveQt ~-I'\\\v3d_external\v3d_main\basic_c_fum '-I'\\\.\v3d_e rnal\y3d_main\common_lib\include' -I'd:\Qt\4.8.6\include\ActiveQt '-I'release' -I'd:\Qt\4.8.6\mkspecs\win32-mevc2013'' -Forelease\ @C:\ rs\user\basic_bQt_aL\common_lib\Irme\uni72A.tmp
test1118_plugin.cpp
Generating Code cl ~ - nologo -Zm200 -Zc:wchar_tFS -O2 -MD -WO -GR -EHsc -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB T_CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_SDNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_THREAD_SUPPORT -DNDEBUG -I'd:\Qt\4.8.6\inc e\QtCore" -I"d:\Qt\4.8.6\include\QtQui" -I"d:\Qt\4.8.6\include" -I"\\\\v3d_external\v3d_main\basic_c_fun" -I"\\\v3d_external\v3d_main\basic_c_fun" -I"\\\\v3d_external\v3d_main\basic_c_fun" -I"\\\v3d_external\v3d_main\basic_c_fun" -I"\\\v3d_external\v3d_main\basic_c_fun" -I"\\\v3d_external\v3d_main\basic_c_fun" -I"\\
v3d_message.cpp stackut1.cpp mg_image_lib.cpp mg_ut11ties.cop
Generating Code cl ~c -nologo -Zm200 -Zc:wchar_tFS -O2 -MD -WO -CR -EHsc -DUNICODE -DWIN32 -DQT_DLL -DQT_NO_DEBUG -DQT_PLUGIN -DQT_GUI_LIB T CORE_LIB -DQT_HAVE_MMX -DQT_HAVE_SDNOW -DQT_HAVE_SSE -DQT_HAVE_MMXEXT -DQT_HAVE_SSE2 -DQT_HREAD_SUPPORT -DNDBEUG -1'4:\Qt\4.8.6\inc e\QtCore" -I"d:\Qt\4.8.6\include\UtGui" -I"d:\Qt\4.8.6\include" -I"\\\\v3d_external\v3d_main\basic_c_fum" -I"\\\v3d_e 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:\ rs\user\Kapplata\Local\Temp\nm8680.tmp
moc_test1118_plugin.cpp link /LIBPATH:"d:\Qt\4.8.6\lib" /NOLOGO /DYNAMICBASE /NXCOMPAT /INCREMENTAL:NO /DLL /OUT:\\\v3d_externa1\v3d_main\bin ugins\test1118\test1118.d11 @C:\Users\user\AppData\Local\Temp\nm89BE.tmp Creating library\\\v3d_external\v3d_main\bin\plugins\test1118\test1118.lib and object\\v3d_external\v3d_main\bi
plugins\test1118\test1118.exp

E:\Vaa3d_workshop\vaa3d_xj\v3d_external\bin\plugins\test1118\

🗟 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

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





Thank you for listening