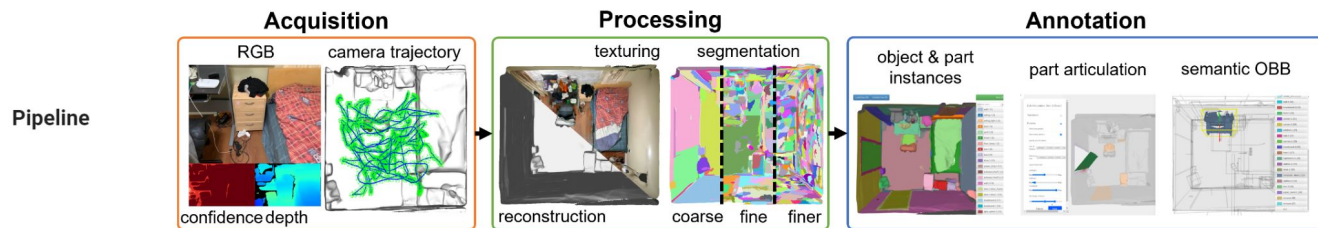


# MultiScan Introduction

Scalable RGBD scanning for 3D environments with articulated objects



# Issues arose when building MultiScan

## Solution: Include missing header and library paths

```
export CPATH=$CONDA_PREFIX/include:$CPATH
```

```
export LD_LIBRARY_PATH=$CONDA_PREFIX/lib:$LD_LIBRARY_PATH
```

```
Cloning into '/data3/haoyunq/multiscan/build/opens3d/3rdparty/Eigen'...
image_io.cc:19:13: fatal error: png.h: No such file or directory
 19 | #   include <png.h>
    |             ^~~~~~
compilation terminated.
make[6]: *** [../../Makefile.inc:29: image_io.o] Error 1
make[5]: *** [elibs/CMakeFiles/ext_mve.dir/build.make:86: elibs/mve/src/ext_mve-stamp/ext_mve-build] Error 2
make[4]: *** [CMakeFiles/Makefile2:248: elibs/CMakeFiles/ext_mve.dir/all] Error 2
make[3]: *** [Makefile:136: all] Error 2
make[2]: *** [CMakeFiles/mvstexturing.dir/build.make:86: external/src/mvstexturing-stamp/mvstexturing-build] Error 2
make[1]: *** [CMakeFiles/Makefile2:141: CMakeFiles/mvstexturing.dir/all] Error 2
make[1]: *** Waiting for unfinished jobs....
From https://github.com/eigenteam/eigen-git-mirror
* branch                cf794d3b741a6278df169e58461f8529f43bce5d -> FETCH_HEAD
^Cmake[2]: *** [CMakeFiles/opens3d.dir/build.make:98: external/src/opens3d-stamp/opens3d-download] Interrupt
make[2]: *** [CMakeFiles/instant-meshes.dir/build.make:98: external/src/instant-meshes-stamp/instant-meshes-download] Interrupt
make[1]: *** [CMakeFiles/Makefile2:89: CMakeFiles/opens3d.dir/all] Interrupt
make[1]: *** [CMakeFiles/Makefile2:115: CMakeFiles/instant-meshes.dir/all] Interrupt
make: *** [Makefile:136: all] Interrupt
```

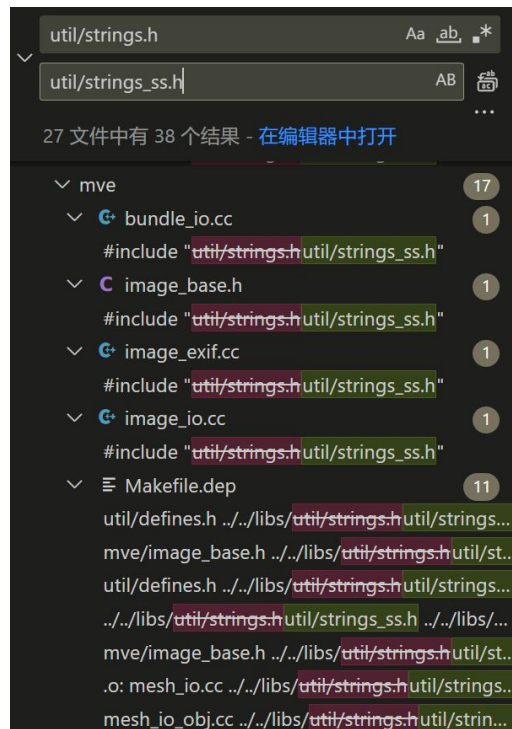
# Issues arose when building MultiScan

Building MVS-Texturing from source. Tons of error happen here.

Caused due to invoking conflict file naming.

Solution: rename

```
In file included from /usr/include/string.h:432,
                  from /usr/include/c++/10/cstring:42,
                  from file_system.cc:15:
./strings.h:237:1: error: template specialization with C linkage
 237 | template <>
      | ^~~~~~
In file included from /usr/include/features.h:461,
                  from /usr/include/x86_64-linux-gnu/c++/10/bits/os_defines.h:39,
                  from /usr/include/x86_64-linux-gnu/c++/10/bits/c++config.h:522,
                  from /usr/include/c++/10/iostream:38,
                  from file_system.cc:10:
/usr/include/string.h:28:1: note: 'extern "C"' linkage started here
 28 | __BEGIN_DECLS
      | ^~~~~~
In file included from /usr/include/string.h:432,
                  from /usr/include/c++/10/cstring:42,
                  from file_system.cc:15:
./strings.h:244:1: error: template specialization with C linkage
 244 | template <>
      | ^~~~~~
In file included from /usr/include/features.h:461,
                  from /usr/include/x86_64-linux-gnu/c++/10/bits/os_defines.h:39,
                  from /usr/include/x86_64-linux-gnu/c++/10/bits/c++config.h:522,
                  from /usr/include/c++/10/iostream:38,
                  from file_system.cc:10:
/usr/include/string.h:28:1: note: 'extern "C"' linkage started here
 28 | __BEGIN_DECLS
      | ^~~~~~
```



```

build > mvs-texturing > elibs > mve > libs > util > C file_system.cc > ..
12 #include <stdexcept>
13 #include <cctype>
14 #include <cerrno> // errno
15 #include <cstring> // std::strerror
16 #include <cstdio> // std::rename

```

```

usr > include > c++ > 10 > C cstring > ...
41 #include <bits/c++config.h>
42 #include <string.h>

```

```

usr > include > C string.h > ...
429 #endif
430
431 #ifdef __USE_MISC
432 # include <strings.h>

```

C Code stack

Caused by naming conflict

```

1 make[6]: warning: jobserver unavailable: using -j1. Add '+' to parent make rule.
2
3 In file included from ./strings.h:13,
4   from /usr/include/string.h:432,
5   from /usr/include/c++/10/cstring:42,
6   from file_system.cc:15:
7 /usr/include/c++/10/ssstream:64:3: error: template with C linkage
8   64 |     template<typename _CharT, typename _Traits, typename _Alloc>
9     |           ^~~~~~
10 In file included from /usr/include/features.h:461,
11   from /usr/include/x86_64-linux-gnu/c++/10/bits/os_defines.h:39,
12   from /usr/include/x86_64-linux-gnu/c++/10/bits/c++config.h:522,
13   from /usr/include/c++/10/iostream:38,
14   from file_system.cc:10:
15 /usr/include/string.h:28:1: note: 'extern "C"' linkage started here

```

```

build > mvs-texturing > elibs > mve > libs > util > C strings.h > ...
12
13 #include <sstream>
14 #include <string>
15 #include <iomanip>
16 #include <stdexcept>

```

```

usr > include > c++ > 10 > C sstream
60 * For this class, open modes (of type @c ios_base::openmode) have
61 * @c in set if the input sequence can be read, and @c out set if
62 * output sequence can be written.
63 */
64 template<typename _CharT, typename _Traits, typename _Alloc>
65 class basic_stringbuf : public basic_streambuf<_CharT, _Traits>
66 {

```

C++ Calls under illegal extern C,  
scope opened by macro is not closed



# Issues arose when building Open3D from source

Nvcc Abort, cannot build

CUDA source files

Solution:

Align cudatoolkit version and

CUDA driver version

NVIDIA-SMI 470.103.01		Driver Version: 470.103.01		CUDA Version: 11.4	
GPU Name	Persistence-M	Bus-Id	Disp.A	Volatile Uncorr. ECC	
Fan Temp	Perf	Pwr:Usage/Cap	Memory-Usage	GPU-Util	Compute M.
				MIG M.	

```
-- CMAKE_CUDA_ARCHITECTURES: 86-real;86-real;86-real;86-real;86-real;86-real;86-real;86-real
CMake Error at /home/qhy/.local/lib/python3.9/site-packages/cmake/data/share/cmake-3.26/Modules/CMakeDetermineCompilerI
d.cmake:751 (message):
  Compiling the CUDA compiler identification source file
  "CMakeCUDACompilerId.cu" failed.
```

```
Compiler: /data3/haoyunq/anaconda3/envs/multiscan/bin/nvcc
```

```
Build flags:
```

```
Id flags: --keep;--keep-dir;tmp -v
```

```
#$ ptxas -arch=sm_52 -m64 "tmp/CMakeCUDACompilerId.ptx" -o
"tmp/CMakeCUDACompilerId.sm_52.cubin"
```

```
ptxas tmp/CMakeCUDACompilerId.ptx, line 9; fatal : Unsupported .version
8.3; current version is '7.7'
```

```
ptxas fatal : Ptx assembly aborted due to errors
```

```
# --error 0xff --
```

```
Call Stack (most recent call first):
```

```
/home/qhy/.local/lib/python3.9/site-packages/cmake/data/share/cmake-3.26/Modules/CMakeDetermineCompilerId.cmake:8 (CM
AKE_DETERMINE_COMPILER_ID_BUILD)
/home/qhy/.local/lib/python3.9/site-packages/cmake/data/share/cmake-3.26/Modules/CMakeDetermineCompilerId.cmake:53 (_
_determine_compiler_id_test)
/home/qhy/.local/lib/python3.9/site-packages/cmake/data/share/cmake-3.26/Modules/CMakeDetermineCUDACompiler.cmake:307
(CMAKE_DETERMINE_COMPILER_ID)
CMakeLists.txt:441 (enable_language)
```

```
-- Configuring incomplete, errors occurred!
```

```
make[2]: *** [CMakeFiles/open3d.dir/build.make:92: external/src/open3d-stamp/open3d-configure] Error 1
```

```
make[1]: *** [CMakeFiles/Makefile2:89: CMakeFiles/open3d.dir/all] Error 2
```

```
make: *** [Makefile:136: all] Error 2
```

# Linker Issue when Building Open3D from Source

Not quite solvable ...

Try to use prebuilt wheel

as suggested in GitHub issues

```
qhy@allegro:/data3/haoyun: x + v
[ 84%] Linking CXX executable ../../bin/examples/Voxelization
[ 84%] Linking CXX executable ../../bin/examples/ISSKeyPoints
[ 84%] Linking CXX executable ../../bin/ConvertPointCloud
[ 84%] Linking CXX executable ../../bin/examples/FileDialog
[ 84%] Linking CXX executable ../../bin/ViewGeometry
[ 84%] Building CXX object cpp/pybind/CMakeFiles/pybind.dir/core/tensor.cpp.o
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_float@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `del_curterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_double@LIBFFI_BASE_7.0'
/usr/bin/ld: ../../lib/Release/libOpen3D.so: undefined reference to `std::condition_variable::wait(std::unique_lock<std::
mutex>&)@GLIBCXX_3.4.30'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tputs@NCURSES6_TINFO_5.0.19991023'
[ 84%] Building CXX object cpp/pybind/CMakeFiles/pybind.dir/core/scalar.cpp.o
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgoto@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `setupterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_void@LIBFFI_BASE_7.0'
[ 85%] Linking CXX executable ../../bin/examples/ViewPCDMatch
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_sint16@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgetflag@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_prep_cif@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgetnum@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_sint32@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `tgetnum@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_sint64@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_call@LIBFFI_BASE_7.0'
[ 85%] Linking CXX executable ../../bin/examples/IntegrateRGBO
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `set_curterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgetent@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgetstr@NCURSES6_TINFO_5.0.19991023'
[ 85%] Linking CXX executable ../../bin/examples/TrimMeshBasedOnPointCloud
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_float@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_pointer@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `del_curterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_sint8@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_double@LIBFFI_BASE_7.0'
/usr/bin/ld: ../../lib/Release/libOpen3D.so: undefined reference to `std::condition_variable::wait(std::unique_lock<std::
mutex>&)@GLIBCXX_3.4.30'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tputs@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgoto@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `setupterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_void@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_float@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_type_sint16@LIBFFI_BASE_7.0'
/usr/bin/ld: /lib/x86_64-linux-gnu/libedit.so.2: undefined reference to `tgetflag@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `del_curterm@NCURSES6_TINFO_5.0.19991023'
/usr/bin/ld: /lib/x86_64-linux-gnu/libLLVM-11.so.1: undefined reference to `ffi_prep_cif@LIBFFI_BASE_7.0'
```

# Ffmpeg issue in MultiScan Processor

Solution: conda's issue, need to update ffmpeg `conda update ffmpeg`

```
[2023-11-26 14:39:37,538][scan_processor][INFO] - Time=0:00:00.022563 for mp4-to-preview, cmd=["scripts/mp4_preview.sh", '/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs', '320']"
[2023-11-26 14:39:37,539][scan_processor][INFO] - Running ['taskset', '-c', '0,1,2,3,4,5,6,7', 'ffmpeg', '-i', '/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.mp4', '-vf', 'select=not(mod(n\\,10)), scale=iw/1:ih/1', '-vsync', 'vfr', '-start_number', '0', '/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/color/%d.png']"
[2023-11-26 14:39:37,539][scan_processor][INFO] - memory limit set to 48 GB
ffmpeg: error while loading shared libraries: libx264.so.138: cannot open shared object file: No such file or directory
[2023-11-26 14:39:37,559][scan_processor][INFO] - Time=0:00:00.019850 for decode color stream, cmd=["taskset", '-c', '0,1,2,3,4,5,6,7', 'ffmpeg', '-i', '/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.mp4', '-vf', 'select=not(mod(n\\,10)), scale=iw/1:ih/1', '-vsync', 'vfr', '-start_number', '0', '/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/color/%d.png']"
[2023-11-26 14:39:37,560][scan_processor][INFO] - Decoding color stream is ended, return code 127
[2023-11-26 14:39:37,560][scan_processor][ERROR] - Scan at /data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA aborted: decode color stream failed
[2023-11-26 14:39:37,560][scan_processor][INFO] - Start processing using open3d integration
```

```
⊗ (multiscan) qhy@ /multiscan$ ffmpeg
ffmpeg: error while loading shared libraries: libx264.so.138: cannot open shared object file: No such file or directory
```

```
{
  toJSON: [Function: responseToJSON],
  caseless: Caseless { dict: [Object] },
  body: '<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">\n' +
    '<title>500 Internal Server Error</title>\n' +
    '<h1>Internal Server Error</h1>\n' +
    '<p>The server encountered an internal error and was unable to complete your request. Either the server is overloaded or there is an error in the application.</p>\n'
  [Symbol(kCapture)]: false,
  [Symbol(kHeaders)]: {
```

# Open3D Dependency Issue

Both 0.16.0 and 0.17.0 do not work.

Try to downgrade to 0.13.0 (specified by CMakeLists.txt in MultiScan)

```
[2023-11-26 14:39:40,137][root][INFO] - start integration
/data3/haoyunq/anaconda3/envs/multiscan/lib/python3.8/site-packages/hydra/_internal/hydra.py:119: UserWarning: Future Hydra versions will no longer change working directory at job runtime by default.
See https://hydra.cc/docs/next/upgrades/1.1_to_1.2/changes_to_job_working_dir/ for more information.
  ret = run_job()
Error executing job with overrides: ['reconstruction.input.color_stream=/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/color', 'reconstruction.input.depth_stream=/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/depth', 'reconstruction.input.metadata_file=/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.json', 'reconstruction.input.trajectory_file=/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.jsonl', 'reconstruction.output.save_folder=/data3/haoyunq/multiscan/server/staging/20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs', 'reconstruction.output.mesh_filename=20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.ply', 'reconstruction.output.decimated_mesh_filename=20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA_decimated.ply', 'reconstruction.output.mesh_align_filename=20231125T145315-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA-align-transform.json']
Traceback (most recent call last):
  File "main.py", line 89, in main
    main_from_cfg(cfg)
  File "main.py", line 50, in main_from_cfg
    recon.run()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 338, in run
    self.integrate()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 306, in integrate
    volume = o3d.t.geometry.TSDFVoxelGrid(
AttributeError: module 'open3d.cuda.pybind.t.geometry' has no attribute 'TSDFVoxelGrid'
```



# Open3D Dependency Issue

Still not working, after careful investigation, even

`python -c 'import open3d as o3d; print(o3d.core.cuda.is_available())'` is False

Solution: Thanks @Richeek, use 0.14.1

```
[2023-11-26 15:08:38,297][root][INFO] - start integration
/data3/haoyunq/anaconda3/envs/multiscan/lib/python3.8/site-packages/hydra/_internal/hydra.py:119: UserWarning: Future Hydra versions will no longer change working directory at
job runtime by default.
See https://hydra.cc/docs/next/upgrades/1.1_to_1.2/changes_to_job_working_dir/ for more information.
    ret = run_job()
Error executing job with overrides: ['reconstruction.input.color_stream=/data3/haoyunq/multiscan/server/staging/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/output
ts/color', 'reconstruction.input.depth_stream=/data3/haoyunq/multiscan/server/staging/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/depth', 'reconstruction
.input.metadata_file=/data3/haoyunq/multiscan/server/staging/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37D
A.json', 'reconstruction.input.trajectory_file=/data3/haoyunq/multiscan/server/staging/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231126T150443-0500_215C84A3-
4B05-44A0-AB44-6BE2994F37DA.jsonl', 'reconstruction.output.save_folder=/data3/haoyunq/multiscan/server/staging/20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/output
s', 'reconstruction.output.mesh_filename=20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.ply', 'reconstruction.output.decimated_mesh_filename=20231126T150443-0500_21
5C84A3-4B05-44A0-AB44-6BE2994F37DA_decimated.ply', 'reconstruction.output.mesh_alignment_filename=20231126T150443-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA-align-transform.jso
n']
Traceback (most recent call last):
  File "main.py", line 89, in main
    main_from_cfg(cfg)
  File "main.py", line 50, in main_from_cfg
    recon.run()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 338, in run
    self.integrate()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 306, in integrate
    volume = o3d.t.geometry.TSDFVoxelGrid(
RuntimeError: [Open3D Error] (std::shared_ptr<open3d::core::DeviceHashmap> open3d::core::CreateDeviceHashmap(int64_t, const open3d::core::Dtype&, const open3d::core::Dtype&, c
onst open3d::core::SizeVector&, const open3d::core::SizeVector&, const open3d::core::Device&, const open3d::core::HashmapBackend&)) /home/runner/work/Open3D/Open3D/cpp/open3d/
core/hashmap/DeviceHashmap.cpp:57: [CreateDeviceHashmap]: Unimplemented device
```

# Open3D Version Issue

[http://www.open3d.org/docs/0.14.1/python\\_api/open3d.t.geometry.TriangleMesh.html](http://www.open3d.org/docs/0.14.1/python_api/open3d.t.geometry.TriangleMesh.html)

[http://www.open3d.org/docs/0.13.0/python\\_api/open3d.t.geometry.TriangleMesh.html](http://www.open3d.org/docs/0.13.0/python_api/open3d.t.geometry.TriangleMesh.html)

```
.to_legacy_triangle_mesh() => .to_legacy()
```

```
[2023-11-26 16:22:45,654][reconstruct][INFO] - --- 0.45725393295288086 seconds read camera extrinsics and intrinsics ---
[2023-11-26 16:22:45,654][root][INFO] - start integration
[2023-11-26 16:23:17,802][reconstruct][INFO] - Extract triangle mesh
[Open3D INFO] Total triangle count = 2955541
/data3/haoyunq/anaconda3/envs/multiscan/lib/python3.8/site-packages/hydra/_internal/hydra.py:119: UserWarning: Future Hydra versions will no longer change working directory at
job runtime by default.
See https://hydra.cc/docs/next/upgrades/1.1_to_1.2/changes_to_job_working_dir/ for more information.
  ret = run_job()
Error executing job with overrides: ['reconstruction.input.color_stream=/data3/haoyunq/multiscan/server/staging/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/output
s/color', 'reconstruction.input.depth_stream=/data3/haoyunq/multiscan/server/staging/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs/depth', 'reconstruction.i
nput.metadata_file=/data3/haoyunq/multiscan/server/staging/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.j
son', 'reconstruction.input.trajectory_file=/data3/haoyunq/multiscan/server/staging/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/20231125T151955-0500_215C84A3-4B05
-44A0-AB44-6BE2994F37DA.jsonl', 'reconstruction.output.save_folder=/data3/haoyunq/multiscan/server/staging/20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA/outputs', '
reconstruction.output.mesh_filename=20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA.ply', 'reconstruction.output.decimated_mesh_filename=20231125T151955-0500_215C84A3
-4B05-44A0-AB44-6BE2994F37DA_decimated.ply', 'reconstruction.output.mesh_alignment_filename=20231125T151955-0500_215C84A3-4B05-44A0-AB44-6BE2994F37DA-align-transform.json']
Traceback (most recent call last):
  File "main.py", line 89, in main
    main_from_cfg(cfg)
  File "main.py", line 50, in main_from_cfg
    recon.run()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 338, in run
    self.integrate()
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 328, in integrate
    self.export(volume)
  File "/data3/haoyunq/multiscan/reconstruction/scripts/reconstruct.py", line 84, in export
    mesh = volume.cpu().extract_surface_mesh(weight_threshold=self.config.alg_param.extract.weight_threshold).to_legacy_triangle_mesh()
AttributeError: 'open3d.cuda.pybind.t.geometry.TriangleMesh' object has no attribute 'to_legacy_triangle_mesh'
```