
PA1 – Playing with OptiX

PA1 – Playing with OptiX

- **NVIDIA OptiX Ray Tracing Engine**
 - NVIDIA's ray tracing engine based on CUDA
 - Requires NVIDIA GPU to work
 - Requires Windows or Linux systems



NVIDIA's commercial renderer, Iray, is built upon OptiX Technology

PA1 – Playing with OptiX

- Prerequisite - CUDA Toolkit
 - NVIDIA's GPGPU interface
 - Download latest version at:
<https://developer.nvidia.com/cuda-downloads>

CUDA Toolkit 12.2 Downloads

Home

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown. By downloading and using the software, you agree to fully comply with the terms and conditions of the [CUDA EULA](#).

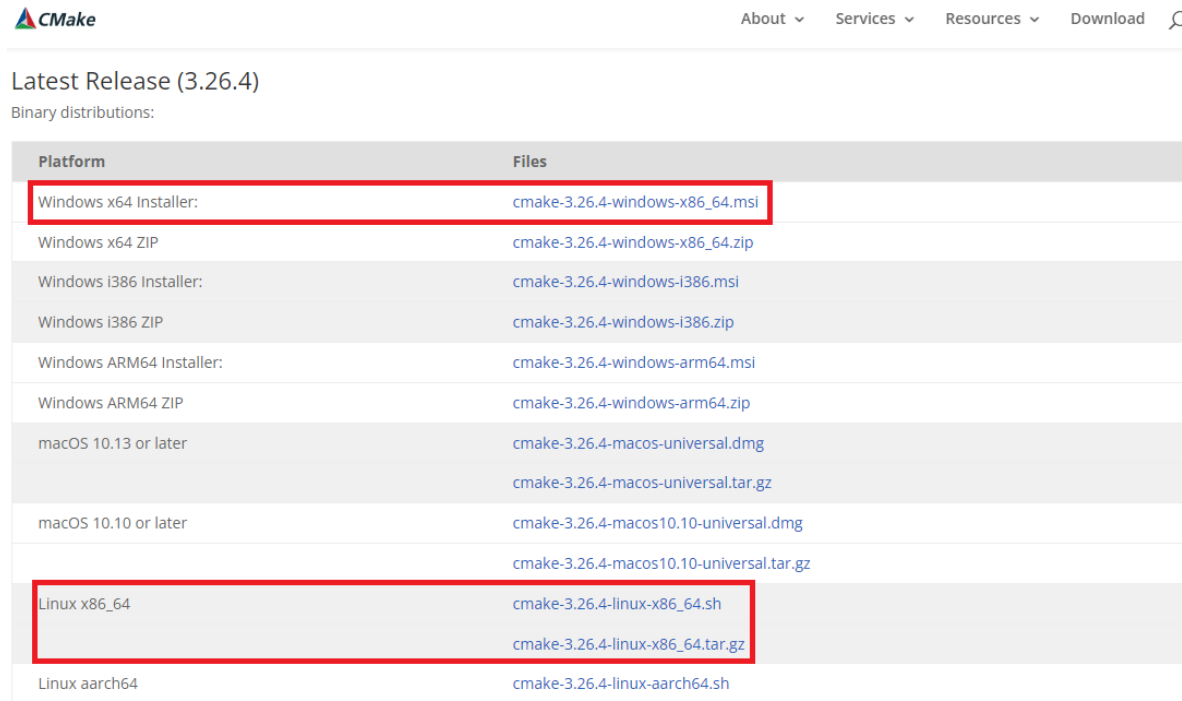
Operating System
Linux Windows

PA1 – Playing with OptiX

- Prerequisite - CMake

- Used for generate various open-source build environments, including OptiX samples
- Download latest version at:

<http://www.cmake.org/download/>



The screenshot shows the CMake website's 'Latest Release (3.26.4)' page. It lists binary distributions for various platforms. Two rows are highlighted with red boxes: 'Windows x64 Installer' and 'Linux x86_64'.

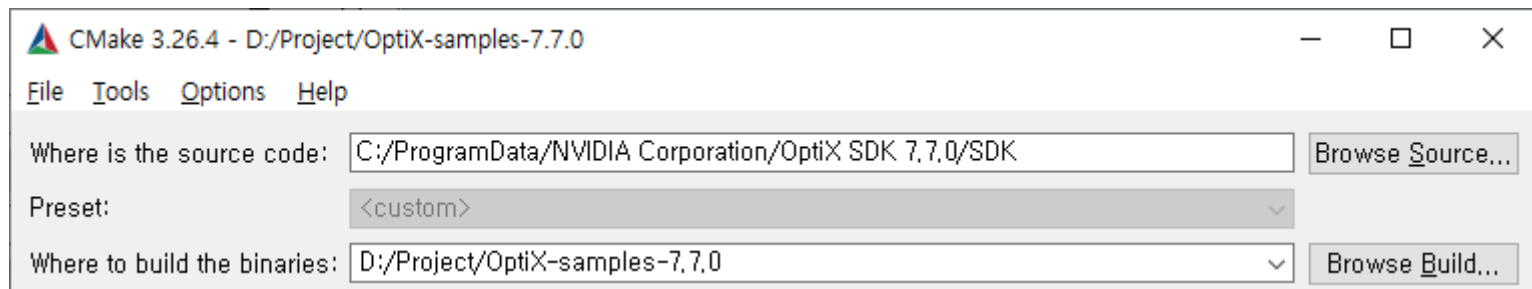
Latest Release (3.26.4)	
Binary distributions:	
Platform	Files
Windows x64 Installer:	cmake-3.26.4-windows-x86_64.msi
Windows x64 ZIP	cmake-3.26.4-windows-x86_64.zip
Windows i386 Installer:	cmake-3.26.4-windows-i386.msi
Windows i386 ZIP	cmake-3.26.4-windows-i386.zip
Windows ARM64 Installer:	cmake-3.26.4-windows-arm64.msi
Windows ARM64 ZIP	cmake-3.26.4-windows-arm64.zip
macOS 10.13 or later	cmake-3.26.4-macos-universal.dmg
	cmake-3.26.4-macos-universal.tar.gz
macOS 10.10 or later	cmake-3.26.4-macos10.10-universal.dmg
	cmake-3.26.4-macos10.10-universal.tar.gz
Linux x86_64	cmake-3.26.4-linux-x86_64.sh
	cmake-3.26.4-linux-x86_64.tar.gz
Linux aarch64	cmake-3.26.4-linux-aarch64.sh

PA1 – Playing with OptiX

- Once both prerequisites are installed, grab OptiX from following location:
 - Requires to join NVIDIA Developer Program Membership
 - <https://developer.nvidia.com/designworks/optix/download>
- Tested environment by TA:
 - Windows 10, 64 bit / Visual Studio 2019
 - Ubuntu 20.04
 - CUDA 11.4 version
 - Cmake 3.21.1 version
 - Optix 7.3.0

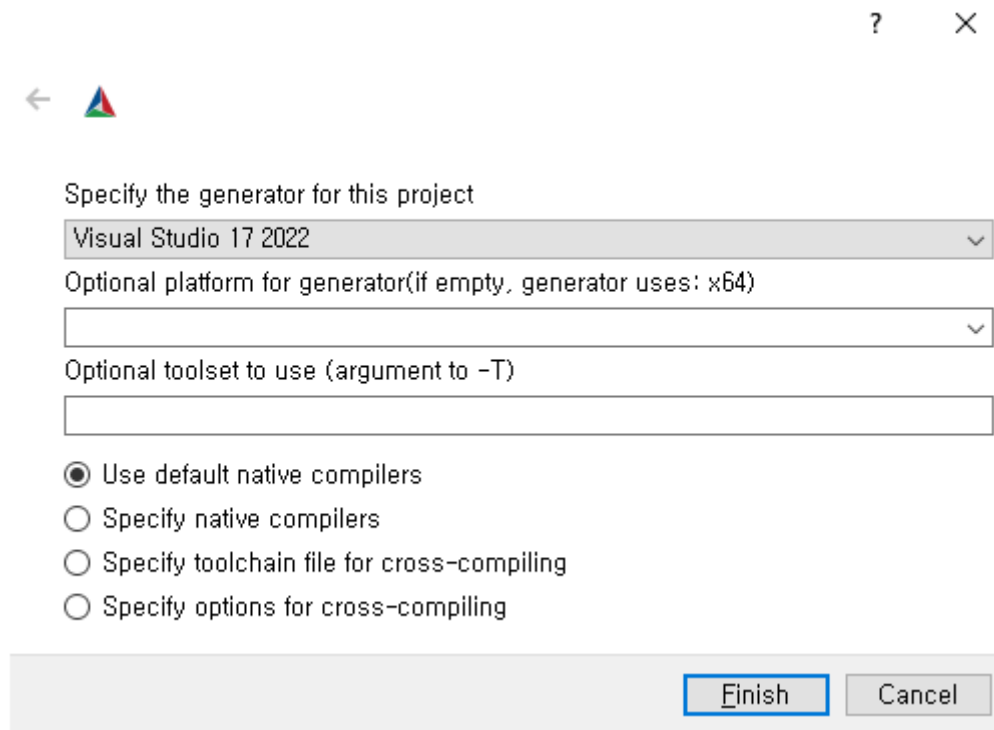
PA1 – Playing with OptiX

- **Let's make project files for OptiX samples!**
 - **Run cmake-gui**
 - **1) Set source code to OptiX SDK location**
 - **In Windows, default location is following:**
 - **%ProgramData% \ NVIDIA Corporation\ OptiX SDK {version} \ SDK**
 - **2) Set destination to a new folder**
 - **Don't set it to the same folder of SDK itself**



PA1 – Playing with OptiX

- Let's make project files for OptiX samples!
 - 3) Click “Configure” and specify your build environment



A screenshot of a configuration dialog box in Visual Studio. The dialog has a title bar with a question mark and a close button. Below the title bar is a back arrow and the Visual Studio logo. The main content area is titled "Specify the generator for this project". It contains three dropdown menus: the first is set to "Visual Studio 17 2022", the second is labeled "Optional platform for generator(if empty, generator uses: x64)" and is empty, and the third is labeled "Optional toolset to use (argument to -T)" and is empty. Below these are four radio button options: "Use default native compilers" (selected), "Specify native compilers", "Specify toolchain file for cross-compiling", and "Specify options for cross-compiling". At the bottom right are "Finish" and "Cancel" buttons.

Specify the generator for this project

Visual Studio 17 2022

Optional platform for generator(if empty, generator uses: x64)

Optional toolset to use (argument to -T)

☒ Use default native compilers

☐ Specify native compilers

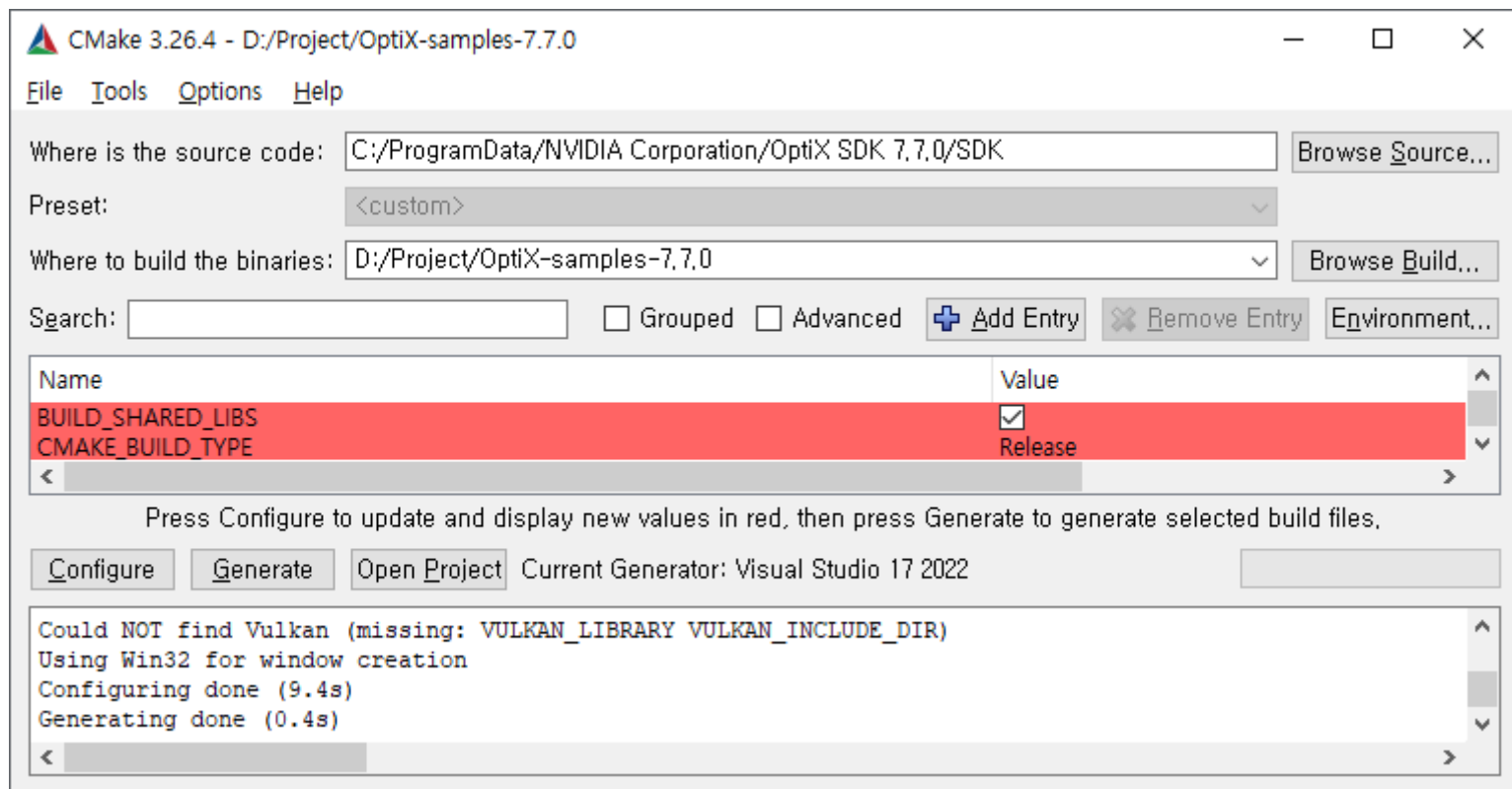
☐ Specify toolchain file for cross-compiling

☐ Specify options for cross-compiling

Finish Cancel

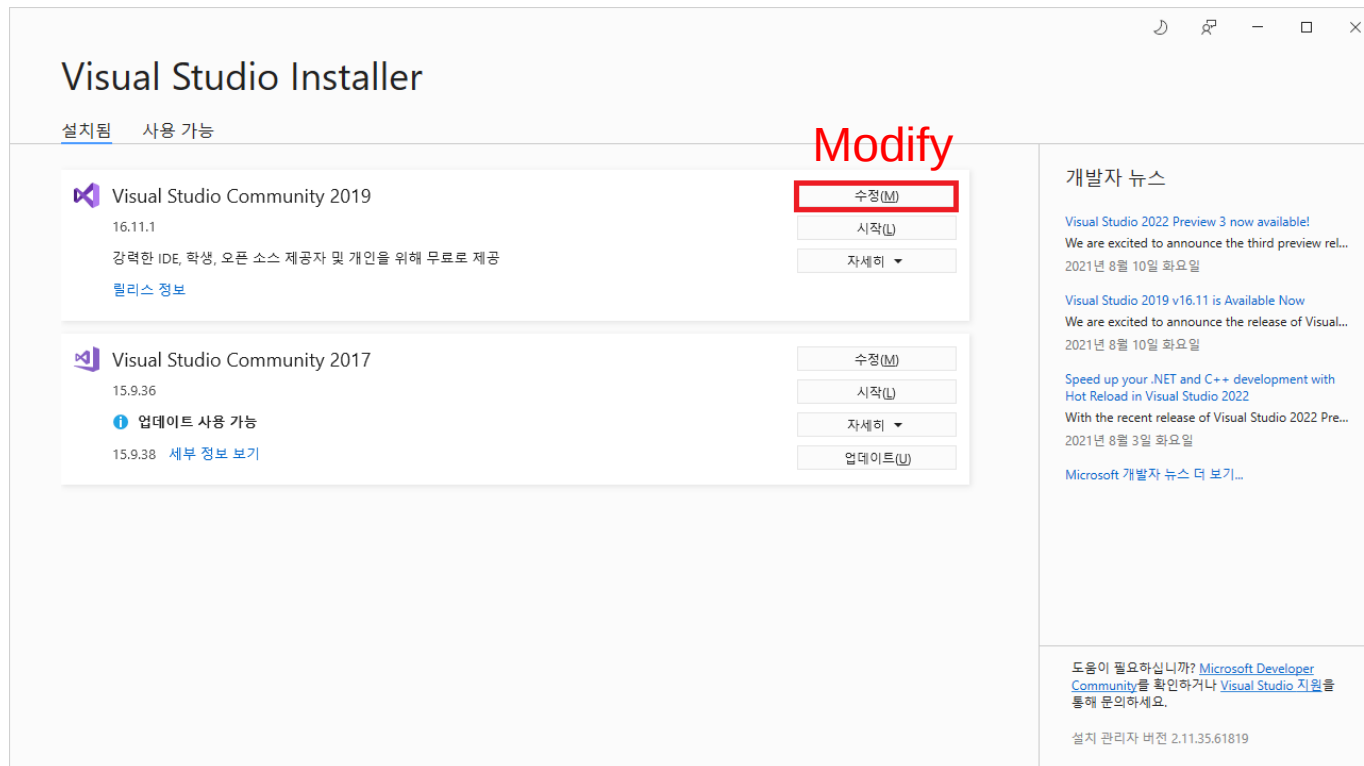
PA1 – Playing with OptiX

- Let's make project files for OptiX samples!
 - 4) If configuring is done, click “Generate” to generate build files.



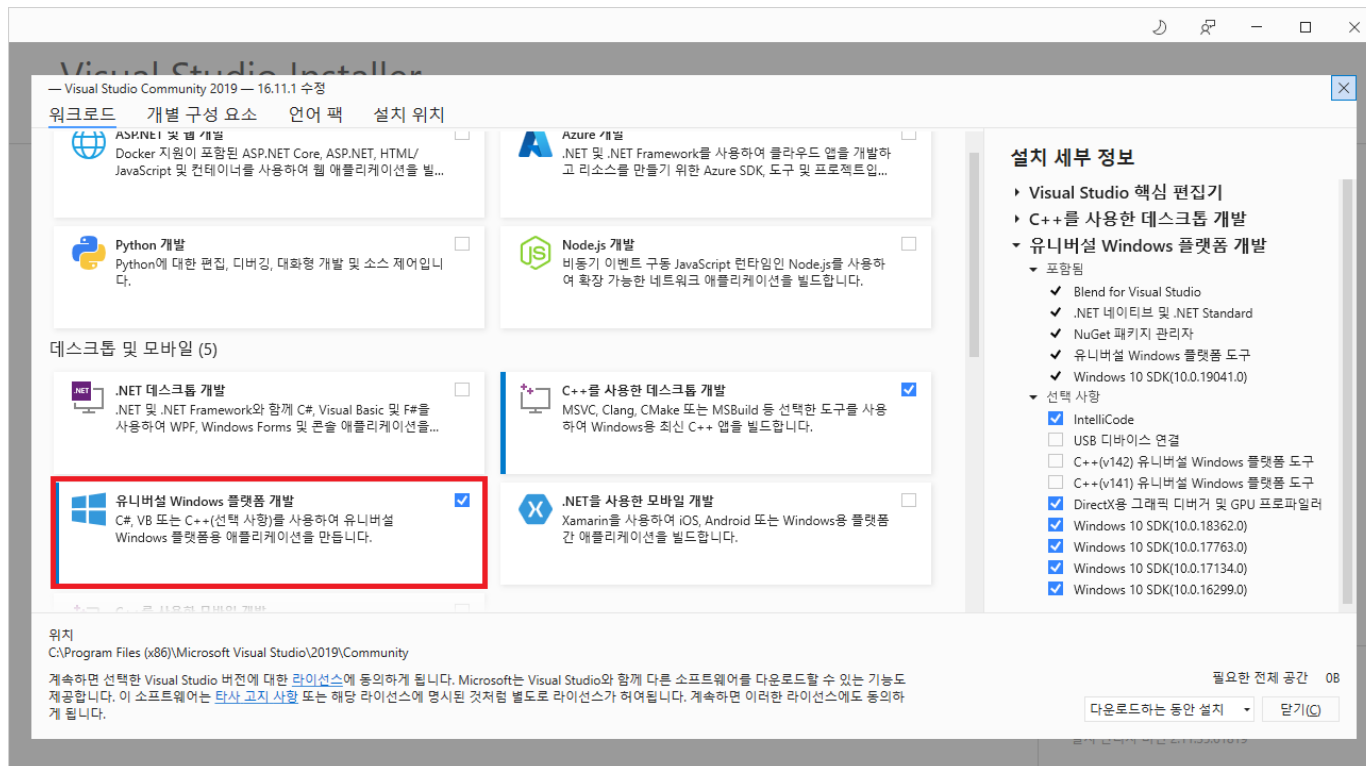
PA1 – Playing with OptiX

- Let's make project files for OptiX samples!
 - If Cmake does not find the compiler, you should modify your Visual Studio to install Universal Windows App Development Tools.



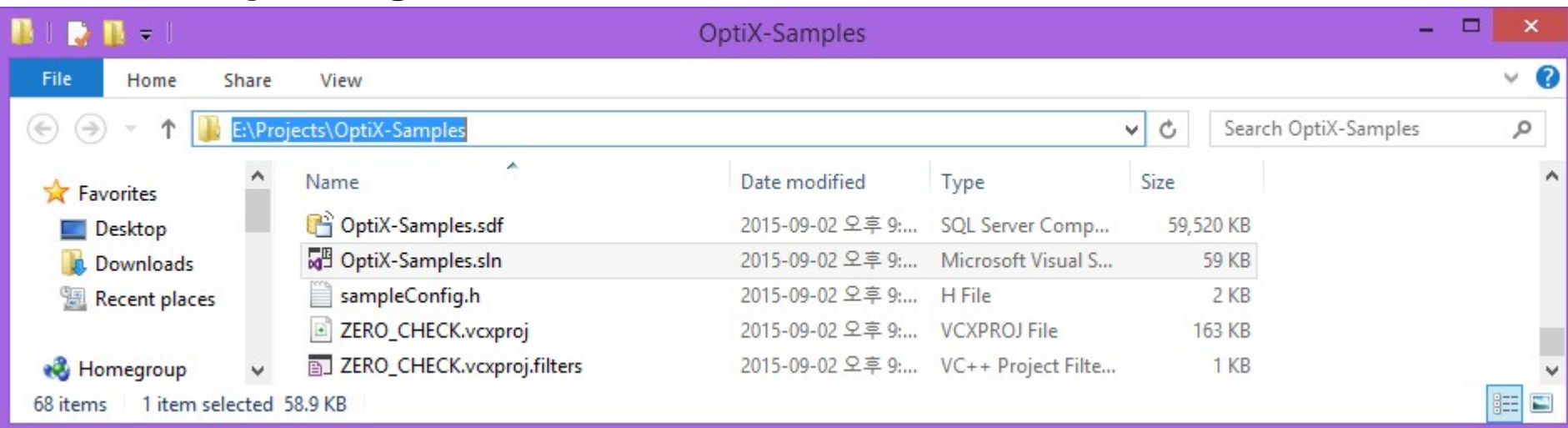
PA1 – Playing with OptiX

- Let's make project files for OptiX samples!
 - If Cmake does not find the compiler, you should modify your Visual Studio to install **Universal Windows App Development Tools**.



PA1 – Playing with OptiX

- **Compile with your environments**
 - In Unix-like OS, default is Makefile
- **Just compile it with “make all”**
 - In Windows, use Visual Studio solutions
- **Build “ALL_BUILD” project to compile everything**



PA1 – Playing with OptiX

- PA1 (OptiX)

Submit screenshots of following projects:

- optixPathTracer, optixSimpleMotionBlur, optixCutouts
- Also, take a look at codes for simple projects to learn how they works
 - optixTriangle, optixSphere, optixWhitted, ...

