

# CMake for VERB4D

Space Environment Modeling Group  
UCLA EPSS



**CMake**  

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*Cross-platform Make*

- Able to create build files for Windows, OSX, and Linux
- Dependency checking (Lapack, BLAS, MATLAB, OpenMP)
- Simplifies the project with minimal maintenance

# Building on OSX / Linux: Generate Makefile

```
[VERB4D_Solver] pwd                                cmake *  
/Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver  
[VERB4D_Solver] mkdir build                        cmake *  
[VERB4D_Solver] cd build                          cmake *  
[build] cmake .. -DCMAKE_C_COMPILER=gcc-5 -DCMAKE_CXX_COMPILER=g++-5  
-- The C compiler identification is GNU 5.2.0  
-- The CXX compiler identification is GNU 5.2.0  
-- Checking whether C compiler has -isysroot  
-- Checking whether C compiler has -isysroot - yes  
-- Checking whether C compiler supports OSX deployment target flag  
-- Checking whether C compiler supports OSX deployment target flag -  
yes  
-- Check for working C compiler: /usr/local/bin/gcc-5  
-- Check for working C compiler: /usr/local/bin/gcc-5 -- works  
-- Detecting C compiler ABI info  
-- Detecting C compiler ABI info - done  
-- Detecting C compile features  
-- Detecting C compile features - done  
-- Checking whether CXX compiler has -isysroot
```

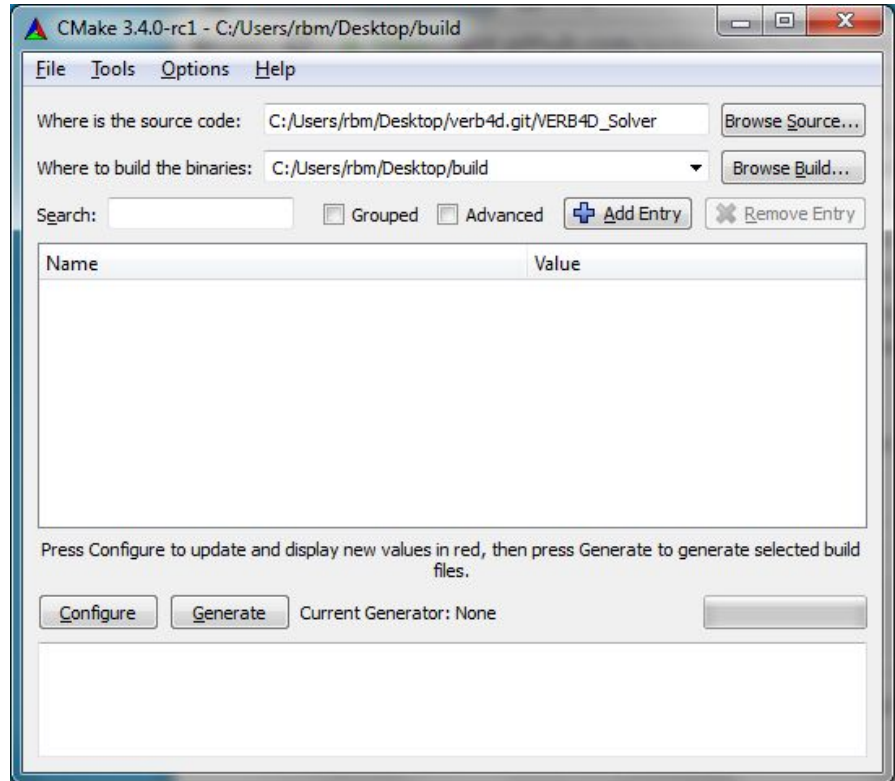
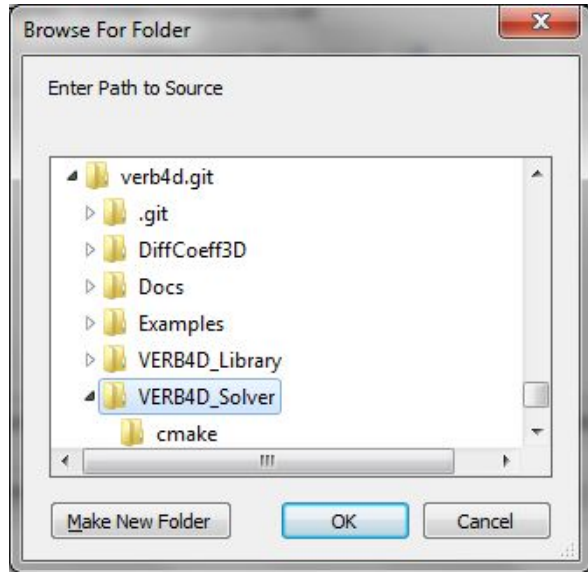
Note: -DCMAKE\_CXX\_COMPILER and -DCMAKE\_C\_COMPILER only need to be specified if gcc is not the default compiler (OSX)

# Building on OSX / Linux: Compiling

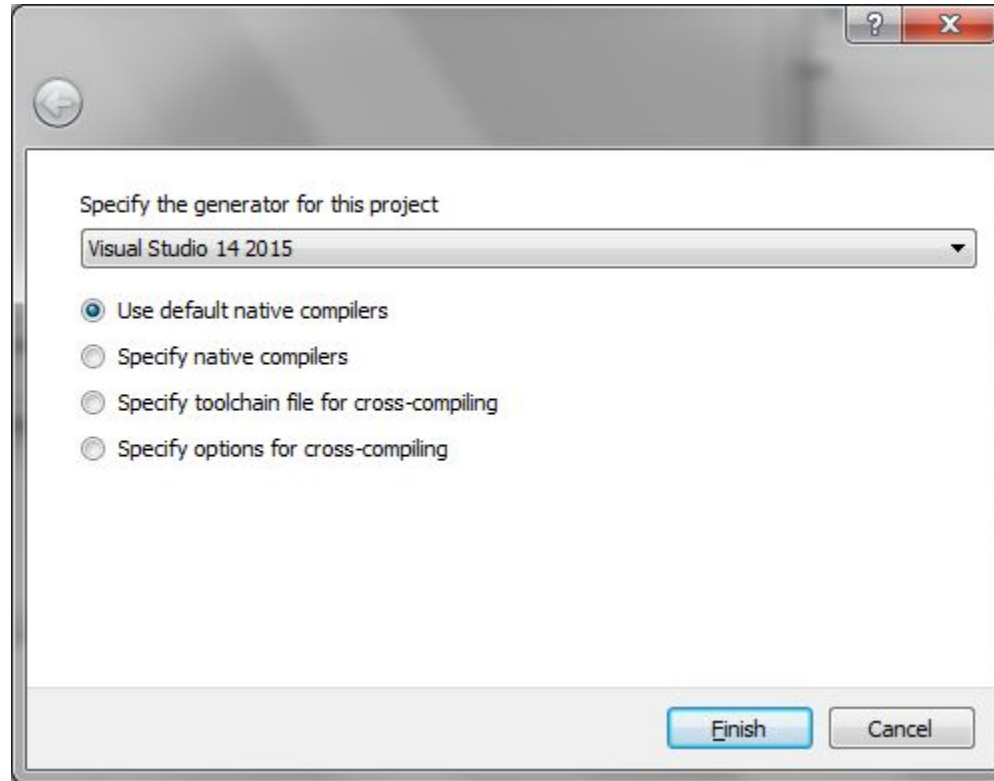
```
[build] make cmake *  
Scanning dependencies of target VERB4D_Solver  
[ 5%] Building CXX object CMakeFiles/VERB4D_Solver.dir/src/Convection_1D_ULTIMATE_QUICKEST6.cpp.o  
In file included from /Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Convection_1D_ULTIMATE_QUICKEST6.h:18:0,  
                 from /Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Convection_1D_ULTIMATE_QUICKEST6.cpp:17:  
/Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Matrix.h:67:12:  
warning: inline function 'T& Matrix1D<T>::operator[](int) [with T = double]' used but never defined  
    inline T& operator[](int i);           ///< Return the i-th value  
    of matrix  
    ^  
In file included from /Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Convection_1D_ULTIMATE_QUICKEST6.h:18:0,  
                 from /Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Convection_1D_ULTIMATE_QUICKEST6.cpp:17:  
/Users/amiyaguchi/Code/UCLA/verb4d/VERB4D_Solver/src/Matrix.h:102:18:
```

# Building on Windows (cmake-gui): Source and Dest

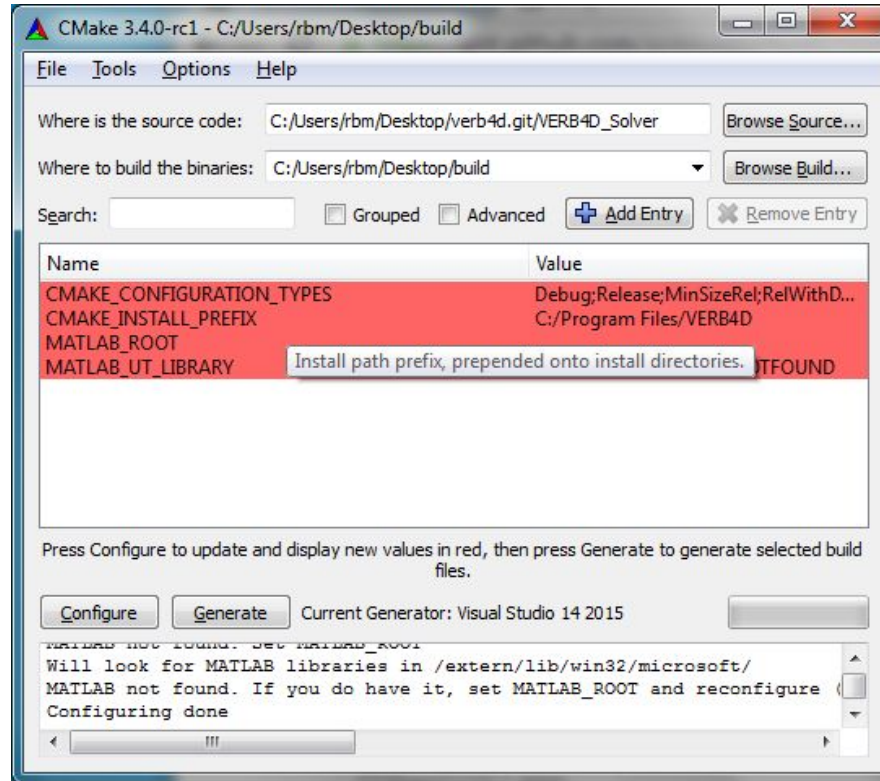
- Browse Source.. - VERB4D\_Solver
- Browse Build - Any folder
- Click on 'Configure'



# Building on Windows (cmake-gui): Configure

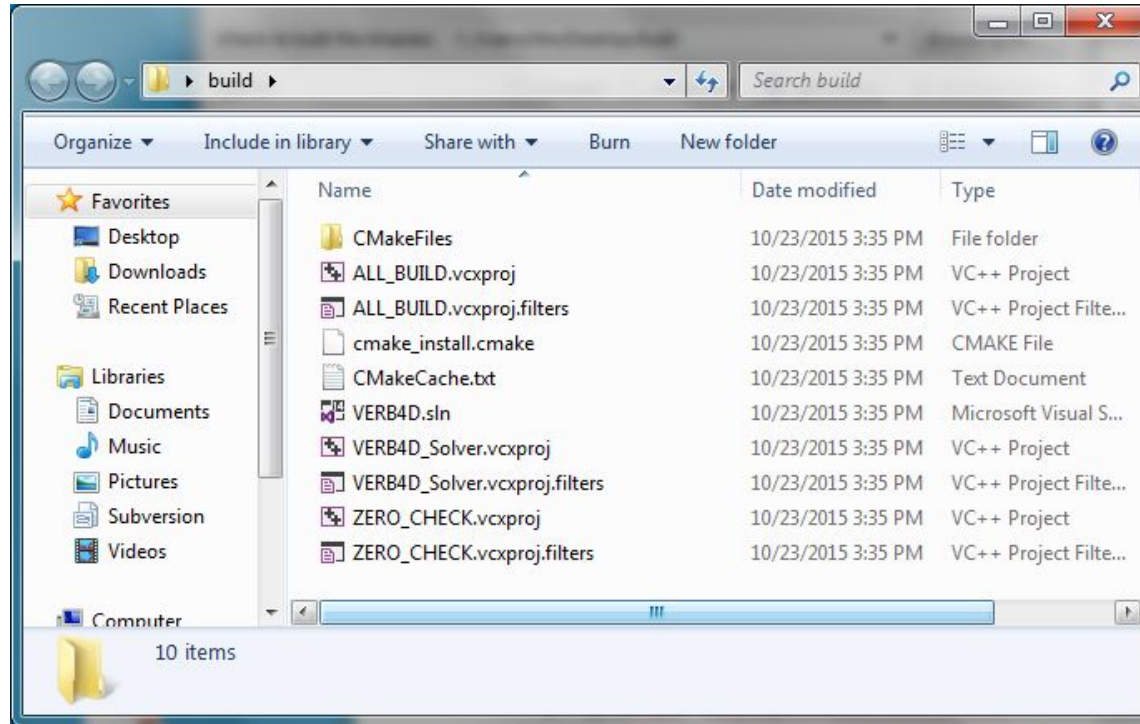


# Building on Windows (cmake-gui): Generate





# Building on Windows (cmake-gui): VERB4D.sln





# Adding new files to the project

- Edit VERB4D\_Solver/CMakeLists.txt
- Add new source files to variable VERB4D\_SOURCES
- Re-run CMake to update project files

```
# Add new source files here and re-run cmake
set(VERB4D_SOURCES
    src/Convection_1D_ULTIMATE_QUICKEST6.cpp
    src/Convection_2D.cpp
    src/Diffusion_1D.cpp
    src/Diffusion_2D.cpp
    src/Diffusion_ADI1.cpp
    src/Diffusion_ADI2.cpp
    src/Diffusion_ADI3.cpp
    src/Interpolation.cpp
    src/Logger.cpp
    src/Matrix.cpp
    src/MatrixSolver.cpp
    src/MonotCubicInterpolator.cpp
    src/Parameters.cpp
    src/ReadInitialData.cpp
    src/UpdatableMatrix.cpp
    src/VERB4D_Solver.cpp)
```

CMakeLists.txt [ + ]

43,1

93%

# Thank You

Refer to project README for more details

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