Setting up CUDA for Matlab using MEX files // 64BIT

Sources

http://forums.nvidia.com/index.php?showtopic=98319&pid=595371&mode=threaded&start=#entry595371
http://www.cs.ucf.edu/~janaka/gpu/index.htm

Software

Windows 7 64bit
Matlab r2010A 64bit
CUDA toolkit 3.1 64bit
GPU computing SDK 64bit (optional)
Microsoft Visual Studio 2008 (2010 also installed)

Necessary Files

Note that some of these files are modified for use with the 64bit platform only! And are added with this .pdf file.

nvmex.pl
nvmexopts.bat
nvmex.m
nvmex_helper.m
vcvarsamd64.bat (for AMD platforms only?)
example.cu (for testing only)

Setup

1: Install all necessary software

2: Copy nvmex.pl into C:\Program Files\MATLAB\R2010a\bin (use the 64bit modified version of this file)

3: Copy nvmex.m, nvmex_helper.m and nvmexopts.bat into the MATLAB workspace directory

4: Copy vcvarsamd64.bat into: C:\Program Files (x86)\Microsoft Visual Studio 9.0\VC\bin\amd64\vcvarsamd64.bat

5: Check where your 'Microsoft SDKs' are located in my case the directory is:
C:\Program Files (x86)\Microsoft SDKs\Windows\v7.0A

6: Check where visual studio is installed, in my case the directory is:
C:\Program Files (x86)\Microsoft Visual Studio 9.0

7: Start MATLAB and open nvmexopts.bat

8: Modify the VS install directories and SDK directories in the file and safe (see coloured text below). Not setting this correctly will give the "cannot open input file 'kernel32.lib'" error.

set VSINSTALLDIR=C:\Program Files (x86)\Microsoft Visual Studio 9.0

set SDKDIR=C:\Program Files (x86)\Microsoft SDKs\Windows\v7.0A

Compiling

To compile the example.cu file put it into the MATLAB directory and type the following in matlab. Be sure the paths are set correctly for your computer. Also make sure the 64bit libraries are used else it won't work (LNK 2019 error).

```
nvmex -f nvmexopts.bat example.cu -IF:\cuda\include -LF:\cuda\lib64 -lcudart -lcufft
```

Use the 'flags' –I, -L and –l to provide additional include directories, library directories and link libraries used in the compilation process. For instance for the CULA lapack libraries:

```
nvmex -f nvmexopts.bat Szeta.cu -IF:\cuda\include -IC:\Progra~1\CULA\include -LF:\cuda\lib64 -LC:\Progra~1\CULA\
lib64 -lcudart -lcufft -lcula
```

Enable syntax highlighting in MATLAB

Start MATLAB -> file -> preferences -> editor/debugger -> language -> drop down menu C++ -> add file extension -> cu -> ok