INSTALLATIONS

All library paths must be inserted in:
ControlPanel → System → Advanced → Environment Variables → System variables → PATH (separate them by a semicolon. Ex:
C:\Libraries\qt-everywhere-opensource-src-4.7.1\bin;
C:\Libraries\InsightToolkit-3.20.0\bin\bin\debug;
C:\Libraries\vtk-5.4.2\bin\bin\debug)
Since these libraries are for the debug mode, if you want to use them for the release mode, add the .dll files that are in libraryX/bin/bin in the release folder of the project.

- **Qt**
  - Download form http://trolltech.com/download?target=ftp://ftp.trolltech.com/qt/source/qt-win-opensource-src-4.4.2.zip (Windows application)
  - Info for installation from: http://doc.trolltech.com/4.1/install-win.html
  - ControlPanel → System → Advanced → Environment Variables → System variables → path → edit. Here add as first the path of the folder that contains Qt (put it in the same place where you will install it, i.e.: C:\Libraries\Qt\bin;)
  - Start → All Programs → Microsoft Visual Studio 2005 → Visual Studio Tools -> Command prompt (!for the 64 bit machine go to the 64 command prompt: Visual Studio 2008 x64 Win64 Command prompt) and type:
    - cd C:\Libraries\Qt
    - configure -platform win32-msvc (for the 64 machine: configure)
    - which edition of qt do you want to use? o
    - do you accept the terms of license? y
    - nmake

- **Cmake**
  - Download from: http://www.cmake.org/cmake/resources/software.html the .exe file cmake-2.6.2-win32-x86.exe and install it.

- **VTK**
  - Download from http://www.vtk.org/get-software.php the file vtk-5.0.4.zip (Release 5.0.4 source) and extract in C:\Libraries\VTK
  - Open CMake:
    - Where is the source code: C:\Libraries\VTK
    - Where to build the binaries: C:\Libraries\VTK\bin
    - Configure → Visual Studio 8 2005 → Ok
    - In case of "error prj0003 cmd.exe": ControlPanel → System → Advanced → Environment Variables → System variables → new: variable=PATH, value=C:\WINDOWS\system32
    - (every time there is something new) put VTK_USE_GUISUPPORT "on", VTK_USE_QVTK "on": Qt desired version: 4; if it doesn't find the path, in QT_QMAKE_EXECUTABLE, press the three dots and put the path: H:/Libraries/Qt/bin/qmake.exe (old version: "use_qt on") configure (the two things can be in two different time of configuration); at the end press OK
    - If you want to create dynamic libraries (.dll) put BUILD_SHARED_LIBS "on"

        - !!! check the Qt version in QT_QMAKE_EXECUTABLE
    - In C:\Libraries\VTK\bin, open VTK.sln
        - Tendina: debug -> F7
        - Tendina: Release -> F7
    - In C:\Libraries\VTK\bin\bin\release copy: QVTKWidgetPlugin.dll and copy it in C:\Libraries\Qt\plugins\designer

- **ITK**
    - Download ITK: http://sourceforge.net/project/downloading.php?groupname=itk&filename=InsightToolkit-3.10.0.zip&use_mirror=garr and extract in C:\Libraries\ITK
    - Download ITK Applications: http://sourceforge.net/project/downloading.php?groupname=itk&filename=InsightApplications-3.10.0.zip&use_mirror=heanet
        - ControlPanel -> System -> Advanced -> Environment Variables -> System variables -> new: variable=INSIGHT_APPLICATION, value=H:\Libraries\InsightApplications-3.10.0
    - Open CMake:
        - Where is the source code: C:\Libraries\ITK\InsightToolkit-3.10
        - Where to build the binaries: C:\Libraries\ITK\InsightToolkit-3.10\bin
        - Configure → Visual Studio 8 2005
        - Put: BUILD_EXAMPLES "off"
          BUILD_TESTING "off"
          ITK_USE_REVIEW "on"
          and at the end press OK.
    - In C:\Libraries\ITK\bin, open ITK.sln
        - Tendina: debug → F7
        - Tendina: Release → F7 (to do faster, do just this)

FIRST USE

- **Qt - Qt designer - Visual Studio**
    - Examples and tutorials: http://doc.trolltech.com/4.0/examples.html
    - Qt classes: http://doc.trolltech.com/4.0/classes.html
    - Create folders: include / src / ui
    - Copy and paste CMakeList.txt and change what needed (name of the project and files needed)
    - Open CMake and give it the path of the main folder (ex: C:\Learning stuff\Faces), then configure until everything is grey, then OK.
      If it doesn't recognize automatically the path for the libraries, put the path of the binary folder (ex: H:/Libraries/InsightToolkit-3.10.0/bin; H:/Libraries/vtk-5.2.1/bin: desired_qt_version:4; qt_qmake_executable: H:/Libraries/qt-win-opensource-src-4.4.2/bin/qmake.exe)
    - Create a .cxx file in the src folder
    - Open FacesGUI.snl

WHEN MOVING A PROJECT OR NON-FOUND LIBRARIES

- The path of the project must be updated using CMake:
  - Open CMake
  - Put the folder path of the project
  - Press: DELETE CACHE
  - Press: configure
- If some libraries are not found, like "Auxiliary\vtk" for example, Projects → Properties → Configuration Properties → C/C++ → General → Additional Include Directories → press the three dots and instead of "Auxiliary\vtk" put: "H:\Libraries\InsightApplications-3.10.0\Auxiliary\vtk"
- If the solution is built in debug mode, the libraries must be compiled in debug mode. If the solution is release mode, the library must be compiled in released mode.

WHEN ADDING NEW FILES TO THE PROJECT

- Header Files -> right click -> add -> new item -> Visual C++ / Code -> Header File (.h)
- Source Files -> right click -> add -> new item -> Visual C++ / Code -> C++ File (.cpp)
- The files are created in the folder of the project (e.g. Trunk)
  - Move the header file to the folder "Include"
  - Change the .cpp file extension to .cxx. Move the c++ file to the folder "src"
- Open "CMakeLists.txt" (in Trunk) and add the file paths and names below "SET ProjectHeaders" and "SET ProjectSrc" respectively. (Be careful to the brackets!). Save the file.
- Close and re-open the .snl file and press F7. Reload when asked. The moc_ file appears.

SVN

- Download and install SVN
- Right click anywhere → TortoiseSVN → Repo-browser → type: https://vertebra.unibe.ch/svn/misc/trunk/mia/ → new folder: Serena (this is the repository folder)
- To import a new project:
  - Locally: right click on the folder → Tortoise SVN → Repo-browser
  - In repository: create the new folder and the needed subfolders (right click→ create folder; for the message write anything, just a letter)
  - Locally: right click on the folder to send to repository → SVN checkout → set the url of the repository and the directory of the local folder (the place where it has to go in the repository and its position locally) → warning: the target folder … is not empty! Are you sure you want to checkout/export into that folder? → yes (the two folders now are linked)
  - Locally: right click on the same folder → Tortoise SVN → Add

- Locally: right click on the same folder → SVN Commit (the files are sent to the repository)
- (the last two steps can be done either on folders or on single files)

WHEN ADDING A NEW CLASS

- Download the new class. Example – the Log-Euclidean registration by Vercauteren. Go to: http://www.midasjournal.org/browse/publication/644. On the right there are both the source code and the documentation, download the .zip file that contains everything, save it in: H:\Libraries and unzip it.
- Open the CmakeFile.txt in trunk and add in this section the underlined line:
  # Use the include path and library for Qt that is used by VTK.
  INCLUDE_DIRECTORIES(
  ${ProjectGUI_SOURCE_DIR}/include
  ${ProjectGUI_SOURCE_DIR}/include/utils
  ${ProjectGUI_SOURCE_DIR}/../LogDomainDemonsRegistration-0.0.3-Source/Code
  ${QT_INCLUDE_DIR}
  ${QT_QTSQL_INCLUDE_DIR}
  ${CMAKE_CURRENT_BINARY_DIR}
  ${CMAKE_CURRENT_SOURCE_DIR}
  $ENV{INSIGHT_APPLICATIONS}/Auxiliary/vtk
)
  (put the class in the folder "addedClasses" in trunk rep and then put in the CmakeFile.txt: ${ProjectGUI_SOURCE_DIR}/addedClasses/PCAonVFs/Code in the same position as above.
)
- Open Run F7 in Visual Studio project → press Reload when asked. It can loose the Auxiliary\vtk → see above: "when moving a project or non-found libraries"

WHEN QT DOESN'T UPDATE

If any change done in the Qt designer ui file is not updated during the debug (F5), it means that the ui.h file is not automatically updated or it is in another folder. To check that, go to the project solution, left toolbox, right click on ui.ui → properties → outputs and check the path of the ui.h file. If it is not where it should be (e.g. in include), change the directory and copy the last file generated somewhere else in the same directory, in order to update it.

HOW TO CREATE A .DLL FILE

In the CMake file, add these lines:

```
ADD_LIBRARY( marchingCubesFromImagesLib SHARED
${marchingCubesFromImages_SOURCE_DIR}/include/Main.h
${marchingCubesFromImages_SOURCE_DIR}/src/Main.cxx)
TARGET_LINK_LIBRARIES( marchingCubesFromImagesLib
```

```
        QVTK
        ${QT_LIBRARIES}
        vtkRendering
        vtkGraphics
        vtkIO
        vtkCommon
        vtkFiltering
        vtkHybrid
        vtkWidgets
        ITKBasicFilters
        ITKCommon
        ITKIO
        ITKNumerics
        ITKIOReview
        itkStatistics
      )
```

`Main.h` will be this way:

```
#ifndef MAIN_H
#define MAIN_H

extern "C" __declspec(dllexport) int MarchingCubesFromImages(int argc, char**
argv);

#endif
```

`Main.cxx` will be this way:

```
#include <time.h>
…

int MarchingCubesFromImages(int argc, char** argv) {
…
}
```

In VisualStudio go on the left side to the project → right click → properties → configuration properties → general → configuration type → dynamic library (.dll)

To use the .dll in the code, write:

```
# pragma comment (lib, "lib_name")
```

just below the includes.

PROBLEMS WITH VISUAL STUDIO

Error: error C2471: cannot update program database .pdb
Solution: Project Options → C/C++ → General → Debug Information Format and set it to C7.