

Exercise Sheet 1

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1 Exercise 1: What is SLAM

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2 Exercise 2: git, cmake, gcc, merge-requests

- Prepends the path where cmake will look for modules with the **include** and **find_package** commands with the current dir (.) and the subdirectory **cmake_modules**
- CMAKE_CXX_STANDARD
 - sets the optional property for the build to use the appropriate compiler and linker flags for the C++11 standard to use the appropriate flags for C++ 11. If a newer compiler/linker is available it will be used (i.e. 14 or 17). If only older versions are available, it will fallback to those.
 - Disables the decay to older C++ standards. If C++11 or newer is not available, compilation will fail.
 - Forces the build to use standard C++11 dialect and not an extended variant of this (such as gnu++11). Having the property set to ON (default) may result in cross-platform build bugs
- CMAKE_CXX_FLAGS Sets global flags and specific flags for specific build targets (specified through e.g. **cmake -DCMAKE_TYPE=DEBUG ..**)
 - Debug
 - * O0: compiles without optimization

- * O3: compiles with full optimization
- * g: compiles with GDB debugging enabled
- * EIGEN_INITIALIZE_MATRICES_BY_NAN: initializes matrices with NaN values, makes it easier to find uninitialized matrices when debugging
- * NDEBUG: disables assert statements in code
- * ftemplate-backtrace-limit=0: disables the limit of instantiation notes for a single error (default is 10)
- * Wall: enables all warnings during build time
- * EXTRA_WARNING_FLAGS: set of flags defined previously to account for different compilers (gcc and clang) e.g.: Wsign-compare (warning generated when signed and unsigned values are compared), Wno-exceptions (disables clang enabled exception warnings)
- * march: is set to native so that compiler generates instructions for the build system's CPU

3 Exercise 3: $SO(3)$ and $SE(3)$ Lie groups