# Stella-vslam installation manual for WSL

Miłosz Wojciechowski

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# Chapter 1

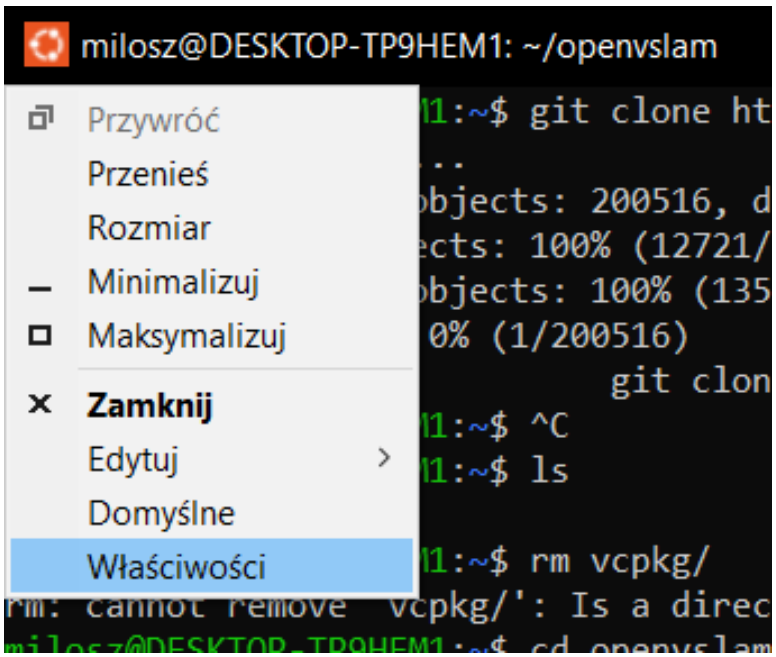
# Environment preparation

## 1.1 Install WSL on your windows 10 system

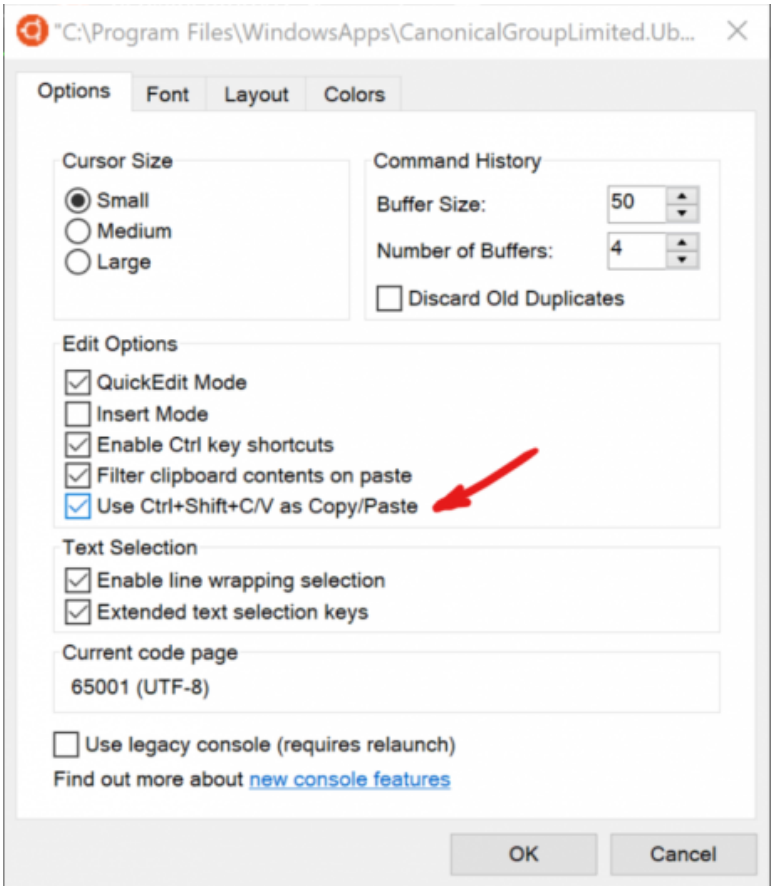
- Open windows command prompt by typing cmd in start menu
- Write *wsl --install* (by default it will install the Ubuntu distribution of Linux, if you want to change that visit this site)
- Just follow instructions displaying on the console, computer restart might be needed
- If you run into an issue during install process check this site

## 1.2 Prepare Ubuntu system

- type your username and password (remember it, since you will need this to work on this system)
- To turn copy/paste on just click on the Ubuntu icon in the left upper corner of the console

- 

Go to Properties.

- 

  Tick "Use Ctrl+Shift+C/V as Copy/Paste" option

- Now search and install system updates by using commands:

  sudo apt update -y

  sudo apt upgrade -y --no-install-recommends

  sudo apt install -y build-essential pkg-config git wget
  sudo apt install -y sqlite3 libsqlite3-dev

  sudo apt-get install binutils-dev
  sudo apt-get install libdwarf-dev

- If you want to search WSL files with Windows File Explorer just type following path in your File Explorer:

  `\\wsl$`

## 1.3 Install CMake

- For safety uninstall CMake version if it was installed by default on Ubuntu:

  sudo apt purge --auto-remove cmake

- Install CMake:

  sudo apt-get install cmake

## 1.4 Install vcpkg

- First install zip and tar package:

  sudo apt-get install curl zip unzip tar

- Download vcpkg from GitHub:

  wget -O vcpkg.tar.gz https://github.com/microsoft/vcpkg/archive/master.tar.gz

- Create a new directory for vcpkg and unpack downloaded file there:

  sudo mkdir /opt/vcpkg
  sudo tar xf vcpkg.tar.gz --strip-components=1 -C /opt/vcpkg

- Now build vcpkg:

  sudo /opt/vcpkg/bootstrap-vcpkg.sh

- Make a symbolic link to the vcpkg command in "/usr/local/bin":

  sudo ln -s /opt/vcpkg/vcpkg /usr/local/bin/vcpkg

- If you want to check the version of installed vcpkg use the following command:

  vcpkg version

- Lastly remove file downloaded from GitHub:

  rm -rf vcpkg.tar.gz

# Chapter 2

# Install libraries required by stella-vslam

## 2.1 Eigen

- To install Eigen use the following command:

  sudo vcpkg install eigen3:x64-linux

## 2.2 g2o

- First install Fortran, to do this use the command:

  sudo apt-get install gfortran

- Now install g2o, x64-linux is added to be sure we are downloading 64-bit version of the library. g2o has many dependencies so installation may take a while:

  sudo vcpkg install g2o:x64-linux

## 2.3 Yaml-cpp

- To install yaml-cpp use:

  sudo vcpkg install yaml-cpp:x64-linux

## 2.4 OpenCV

- First install bison utility:

  sudo apt-get update
  sudo apt-get install bison

- Now install libgtk2.0-dev:

  sudo apt-get install libgtk2.0-dev

- Install OpenCV3:

  sudo vcpkg install opencv3:x64-linux

## 2.5 Pangolin

- Install nasm:

  sudo apt-get install nasm

- Install Glew:

  sudo apt-get install libglew-dev

- Install Pangolin:

  sudo vcpkg install pangolin:x64-linux

## 2.6 FBoW

- Use the following commands to download and build the custom version of the library:

  cd /tmp
  git clone https://github.com/stella-cv/FBoW.git
  cd FBoW

```
mkdir build && cd build
cmake \
      -DCMAKE_BUILD_TYPE=Release \
      -DCMAKE_INSTALL_PREFIX=/usr/local \
      -S ../ -DBUILD_TESTS=ON -DBUILD_UTILS=ON \
      -DCMAKE_TOOLCHAIN_FILE=/opt/vcpkg/scripts/buildsystems/vcpkg.cmake
make -j4 && sudo make install
```

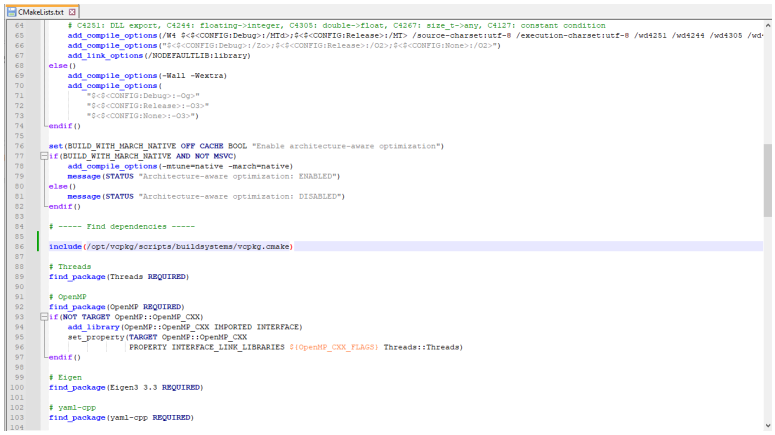
# Chapter 3

# Stella-vslam installation

## 3.1 Build basic library

- mkdir -p ~/lib
- cd ~/lib
- git clone --recursive https://github.com/stella-cv/stella_vslam.git
- mkdir build && cd build
- cmake -DCMAKE_BUILD_TYPE=RelWithDebInfo -S ../stella_vslam \
  -DCMAKE_TOOLCHAIN_FILE=/opt/vcpkg/scripts/buildsystems/vcpkg.cmake
- **SKIP TO MAKE -J4 IF CMAKE COMMAND WAS SUCCESSFUL**
  If previous command gives you error that some library installed via vcpkg wasn't detected perform the following step:
  Open CMakeLists.txt in /lib/stella_vslam directory and paste the following line before find_package()

  include(/opt/vcpkg/scripts/buildsystems/vcpkg.cmake)

- 


  It should look like this.
  Then run command:
  cmake `-DCMAKE_BUILD_TYPE`=RelWithDebInfo -S ../`stella_vslam`

- make -j4
- sudo make install

## 3.2 Build with support for PangolinViewer

- cd ~/lib
- git clone -b 0.0.1 --recursive https://github.com/stella-cv/`pangolin_viewer`.git
- mkdir -p `pangolin_viewer`/build
- cd `pangolin_viewer`/build
- cmake `-DCMAKE_BUILD_TYPE`=RelWithDebInfo -S ../ \
  `-DCMAKE_TOOLCHAIN_FILE`=/opt/vcpkg/scripts/buildsystems/vcpkg.cmake
- **SKIP TO MAKE -J IF CMAKE COMMAND WAS SUCCESSFUL**
  If previous command gives you error that some library installed via vcpkg wasn't detected perform the following step:
  Open CMakeLists.txt in lib/`pangolin_viewer` directory and paste the following line before `find_package`()

  include(/opt/vcpkg/scripts/buildsystems/vcpkg.cmake)

  Then run command:
  cmake `-DCMAKE_BUILD_TYPE`=RelWithDebInfo -S ../

- make -j
- sudo make install

## 3.3 Build examples

- Install Backward-cpp library:

  sudo apt-get install libbackward-cpp-dev

- cd ~/lib
- git clone -b 0.0.1 --recursive https://github.com/stella-cv/`stella_vslam_examples`.git
- mkdir -p `stella_vslam_examples`/build
- cd `stella_vslam_examples`/build
- cmake \
  `-DCMAKE_BUILD_TYPE`=RelWithDebInfo \
  `-DUSE_STACK_TRACE_LOGGER`=ON \
  -S ../ `-DCMAKE_TOOLCHAIN_FILE`=/opt/vcpkg/scripts/buildsystems/vcpkg.cmake
- **SKIP TO MAKE -J IF CMAKE COMMAND WAS SUCCESSFUL**
  If previous command gives you error that some library installed via vcpkg wasn't detected perform the following step:
  Open CMakeLists.txt in lib/`stella_vslam_examples` directory and paste the following line before `find_package`()

  include(/opt/vcpkg/scripts/buildsystems/vcpkg.cmake)

  Then run command:
  cmake \
  `-DCMAKE_BUILD_TYPE`=RelWithDebInfo \
  `-DUSE_STACK_TRACE_LOGGER`=ON \
  -S ../
- make -j
- After building check if everything was successfully built:

  ./`run_kitti_slam` -h