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Project SetUp Instruction Manual

# Collision Monitoring for a Mobile Manipulator

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Following are the prerequisites (tested) for installing the collision monitoring library.

- Linux Ubuntu OS (16.04, 18.04)
- ROS (Kinetic, Melodic)

## 1 Installation of Dependency Packages from Source

1. Install CMAKE ( $\geq 3.18.4$ )
  - (a) Download CMAKE source code (cmake-\*.tar.gz)
  - (b) Extract the compressed files.
  - (c) Open a terminal and navigate into cmake folder by using 'cd' command.
  - (d) Create a folder named 'build' and navigate into into it (mkdir build and cd build).
  - (e) Execute the command './bootstrap'.
  - (f) Execute the command 'make'.
  - (g) Execute the command 'sudo make install'.
2. Install EIGEN ( $\geq 3.3.7$ )
  - (a) Download EIGEN source code (eigen-\*.tar.gz)
  - (b) Extract the compressed files.
  - (c) Open a terminal and navigate into eigen folder by using 'cd' command.
  - (d) Create a folder named 'build' and navigate into into it (mkdir build and cd build).
  - (e) Execute the command 'cmake ..'.
  - (f) Execute the command 'sudo make install'.
3. Install KDL
  - (a) Clone from the github page ([Link](#))

- (b) Open a terminal and navigate into 'orocos\_kinematics\_dynamics/orocos\_kdl' folder by using 'cd' command.
- (c) Create a folder named 'build' and navigate into into it (mkdir build and cd build).
- (d) Execute the command 'cmake ..'.
- (e) Execute the command 'make'.
- (f) Execute the command 'sudo make install'.

#### 4. Install KDL Parser

- (a) Clone the source code branch based on your ROS from the github page (Link)
- (b) Open a terminal and navigate into 'kdl\_parser/kdl\_parser' folder by using 'cd' command.
- (c) Create a folder named 'build' and navigate into into it (mkdir build and cd build).
- (d) Execute the command 'cmake ..'.
- (e) Execute the command 'make'.
- (f) Execute the command 'sudo make install'.

#### 5. Install ROS Kortex

- (a) Clone the source code from the github page (Link)
- (b) Follow the instructions provided under 'build' section on github page.

## 2 Instructions for Compiling the Collision Monitoring Library

1. Clone the source code from the project github page (Link).
2. Compile 'Narko\_description' available in 'catkin\_workspace/src' folder by following below instructions.

- (a) Navigate into the folder 'Narko\_description' available in 'catkin\_workspace/src'.
  - (b) Create a folder named 'build' and navigate into it (mkdir build and cd build).
  - (c) Execute the command 'cmake ..'.
  - (d) Execute the command 'make'.
  - (e) Execute the command 'sudo make install'.
3. Compile the Collision Monitoring Library.
- (a) Navigate into 'sdp\_ws20\_collision\_monitoring\_for\_robotic\_manipulators' folder.
  - (b) Create a folder named 'build' and navigate into it (mkdir build and cd build).
  - (c) Execute the command 'cmake ..'.
  - (d) Execute the command 'make'.
  - (e) Execute the command 'sudo make install'.
4. Compile the Library and ROS packages for simulation and testing.
- (a) Navigate into 'catkin\_workspcae' folder.
  - (b) Execute the command 'catkin\_make'.
  - (c) Execute the command 'source devel/setup.bash'.
5. For visualization of the output launch the launch files present under folders '/kinova\_arm/launch' for visualizing arms and for visualizing the mobile base and arms use 'narko\_kinova\_base\_collision/launch', using the command 'roslaunch \*.launch'