SCITOS – MIRA installation guide

Version: 2019-11-08

Prerequisites for MIRA

The following instruction explains, how to install a binary version of MIRA on a SCITOS robot. Binaries are available for the following operation systems:

- Ubuntu 12.04LTS, 32bit (until end of 2016)
- Ubuntu 12.04LTS, 64bit (until end of 2016)
- Ubuntu 14.04LTS, 64bit (until end of 2018)
- Ubuntu 16.04LTS, 64bit
- Ubuntu 18.04LTS, 64bit
- Redhat Enterprise Linux / CentOS 6.x, 32bit
- Redhat Enterprise Linux / CentOS 7.x, 64bit

The installer script can be requested and downloaded via the following URL:

http://www.mira-project.org/joomla-mira/index.php/resources/installer-download

The following instructions assume, that the installer script `mira-installer-binary.sh` is already downloaded, that you're working as user `demo` and that `root` access is available on the machine.

Furthermore, these instructions will install MIRA in the directory `/opt`.

MIRA Reference documentation

The MIRA reference documentation is available via the following URL:

http://www.mira-project.org/MIRA-doc/index.html

MIRA Question & Answer forum

For questions regarding MIRA an online forum is available on the following URL:

http://www.mira-project.org/osqa/

MIRA announcement mailing list

- Announcements of updates, releases and other important MIRA news.
- Adresse: `news@mira-project.org`
- Subscribe here: `http://www.mira-project.org/mailman/listinfo/news`

Installation of MIRA

Ubuntu 16.04LTS, 64 bit:

```
> sudo bash ./mira-installer-binary.sh ubuntu-1604lts-x64
```

Please use the directory `/opt/MIRA` for installation.

```
> sudo chown -R demo.demo .config/mira
```

Ubuntu 18.04LTS, 64 bit:

```
> sudo bash ./mira-installer-binary.sh ubuntu-1804lts-x64
```

Please use the directory `/opt/MIRA` for installation.

```
> sudo chown -R demo.demo .config/mira
```

Redhat Enterprise Linux / CentOS 6.x:

```
> su -
> ./mira-installer-binary.sh redhat-el6-i686
```

Please use the directory `/opt/MIRA` for installation.

Redhat Enterprise Linux / CentOS 7.x:

```
> su -
> ./mira-installer-binary.sh redhat-el7-x64
```

Please use the directory `/opt/MIRA` for installation.

Now all basic MIRA packages will be downloaded and installed on your machine.

After all packages are installed, please put the following configuration to your environment (typically you should use the file `~/.bashrc`):

```
##################################################################
# MIRA configuration

export MIRA_PATH=/opt/MIRA
export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:/opt/MIRA/lib
export PATH=${PATH}:/opt/MIRA/bin
source /opt/MIRA/scripts/mirabash
```

Installation of MIRA-commercial

First, a new MIRA environment for MIRA-commercial has to be created.

Ubuntu version:

```
> sudo -s
> source ~demo/.bashrc
> mirawizard -e MIRA-commercial /opt/MIRA-commercial
> exit
```

Redhat Enterprise Linux / CentOS version:

```
> su -
> source ~demo/.bashrc
> mirawizard -e MIRA-commercial /opt/MIRA-commercial
> exit
```

Now, the environment variables have to be updated as following:

```
#####################################################################
# MIRA-commercial configuration

export MIRA_PATH=${MIRA_PATH}:/opt/MIRA-commercial
export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:/opt/MIRA-commercial/lib
```

In the next step, the MIRA-commercial repository must be added to mirapackage:

Ubuntu 16.04LTS, 64 bit:

```
> sudo -s
> source ~demo/.bashrc
> mirapackage --addurl \
      ftp://ftp.metralabs-service.com/repos/MIRA-commercial/ \
      ubuntu-1604lts-x64/MIRA-commercial.repo
```

Ubuntu 18.04LTS, 64 bit:

```
> sudo -s
> source ~demo/.bashrc
> mirapackage --addurl \
      ftp://ftp.metralabs-service.com/repos/MIRA-commercial/ \
      ubuntu-1804lts-x64/MIRA-commercial.repo
```

CentOS 6.x:

```
> su -
> source ~demo/.bashrc
> mirapackage --addurl \
      ftp://ftp.metralabs-service.com/repos/MIRA-commercial/ \
      redhat-el6-i686/MIRA-commercial.repo
```

CentOS 7.x:

```
> su -
> source ~demo/.bashrc
> mirapackage --addurl \
      ftp://ftp.metralabs-service.com/repos/MIRA-commercial/ \
      redhat-el7-x64/MIRA-commercial.repo
```

Now, please start mirapackage, *Reindex* all repositories and install the desired packages. A list of recommenced packages can be found is the next section.

Note: To use the packages of the MIRA-commercial repository, a valid license file is necessary! The license file must be copied in the directory `/opt/MIRA-licenses`.

Package list for MIRA-CogniDrive

A typically installation of MIRA-CogniDrive consists of the following packages:

Toolboxes:

```
CAN
DeviceManager
GMapping
MapBuilderBase
MapBuilderGUI
Maps
Mapping
```

Domains:

```
can/CANDriver
localization/Poseidon
localization/PersistentLocalization
mapping/CostMapper
mapping/GMappingModule
mapping/MCFLoader
mapping/OccupancyGridLoader
mapping/OccupancyGridMapper
mapping/OccupancyGridMappingModule
mapping/OccupancyGridMerger
mapping/PathTransformModule
navigation/Pilot
navigation/PilotNogoAreas
navigation/PilotVarResDynamicWindow
robot/RobotModelPublisher
robot/SCITOS
robot/SCITOSConfigs
sensors/RangeFinder
```

SCITOS Configuration File

To deal with the different possible SCITOS configuration options, a global configuration file should be used. The example configurations in the package `SCITOSConfigs` assume, that this file is located at:

`/opt/SCITOS/SCITOSRobotAttributes.xml`

Example configuration file:

```
<root>
  <!-- Type of robot [SCITOS-2013, SCITOS-A5, SCITOS-G5, SCITOS-G6, SCITOS-G6-small, SCITOS-G3] -->
  <var robot="SCITOS-2013" />

  <!-- Type of the CAN bus [PCAN, MLCAN] -->
  <var canType="MLCAN" />
  <!-- CAN bus device (default=[PCAN: /dev/pcan32, MLCAN:/dev/ttyUSB2]) -->
  <var canDevice="/dev/ttyUSB2" />

  <!-- Type of mounted front laser [SickS300, LeuzeRS4, Hokuyo-URG-04LX, LZRU901] -->
  <var frontLaser="SickS300" />
  <!-- Device of the front laser (default=/dev/ttyUSB0) -->
  <var frontLaserDevice="/dev/ttyUSB0" />
  <!-- The laser ignore interval file name. Optional-->
  <!-- <var frontLaserIgnoreIntervals="file_to_ignoreintervals.xml"/> -->

  <!-- Type of mounted back laser [none, SickS300, LeuzeRS4, Hokuyo-URG-04LX, LZRU901] -->
  <var rearLaser="none" />
  <!-- Device of the rear laser (default=/dev/ttyUSB1) -->
  <var rearLaserDevice="/dev/ttyUSB1" />
  <!-- The laser ignore interval file name. Optional -->
  <!-- <var rearLaserIgnoreIntervals="file_to_ignoreintervals.xml"/> -->

  <!-- Is there a safety field configured for the robot -->
  <var safetyZone="false" />
  <var maxSafetyZoneVelocity="0.3" />

  <!-- Does the robot have a magnetic safety sensor -->
  <var magneticSensor="false" />

  <!-- Does the robot have sonar -->
  <var sonar="false" />

  <!-- Body type for G6 robots [normal, tray] -->
  <var bodyType="normal" />

  <!-- Cover type for A5 and G5 robots [2008, 2011, 2012]
       2008 = Older robots with cover with stabilizers
       2011 = Older robots with cover without stabilizers
       2012 = Newer robots with more field of view for the laser. -->
  <var coverType="2012" />
  <!-- Does this robot have a cover / case? For SCITOS-2013 robots -->
  <var cover="false" />

  <!-- Cover color r g b -->
  <var color="1 0 0" />

  <!-- Only for G5 robots. Does the robot have a human machine interface (display) -->
  <var hmi="false" />
  <!-- Does the robot have a SCITOS head -->
  <var head="false" />
  <!-- Does the robot have a head mounted camera? For SCITOS-2013 robots -->
  <var cameraHeadConfig="none" />

  <!-- The configuration file for the robot. Optional -->
  <!-- <var robotConfigFile="file_to_robot_config.xml"/> -->
</root>
```