

Simulate a UR5 robot on ROS -Gazebo

1) Set up a simulation environment for a UR5 robot using Gazebo

- use an open source example for the usage of ROS and Gazebo
(https://github.com/ros-industrial/universal_robot)

ros-industrial/universal_robot: ROS-Industrial Universal Robots support (http://wiki.ros.org/universal_robot) - GitHub

Universal Robot. ROS-Industrial Universal Robot meta-package. See the ROS wiki page for compatibility information and other more information.. Installation. There are two different ways to install the packages in this repository. The following sections detail installing the packages using the binary distribution and building them from source in a Catkin workspace.

github.com

)

- write a custom ROS node to publish desired joint angles to the UR5 robot in Gazebo

- publish joint angles as function of sine waves on all of the joints

- write a launch file which starts all nodes and visualizes the results of this task

2) Prepare a data collection pipeline to collect the robot data from simulated UR5 robot and store into Edge gateway. This data can be optionally sync with cloud.

- Sketch the proposed SW architecture

- Write necessary modules/services for the data pipeline

- Present the data pipeline, e.g. visualize the data in real-time and in storage

Hints:

- feel free to use open-source or commercial products but please explain the choice.

- feel free to add as many type of data as you wish but minimally there should be joint angles/configurations and camera

3) Propose solution expand the architecture with ML/AI capability with data from the storage. Prepare a simple code sample or notebook that show-cases on how to:

- load storage data

- prepare dataset

- train the model

- infer the model

Hints:

- feel free to choose the ML/AI problem that you want to solve with the code sample.

Push all the codes onto your git account.

You code should have the following items (bare minimum)

<name_of_your_folder>

-><src>

```
-><include>  
->CMakeLists.txt
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-> ... ( anything which you believe should be in your  
folder)
```