System Setup

This is the master setup guide for setting up the software framework for the SLAMR01 project to run on a PC or Jetson processor. This software provides navigation and user feedback capabilities for integration with a prosthetic vision device (e.g., Argus II Retinal Prosthesis System).

These instructions were written using Jetson AGX Xavier and Jetson AGX Orin devices flashed running Ubuntu 20 (JetPack5).

NOTE: These instructions are written for ROS1 whose latest version (ROS Noetic) only supports up to Ubuntu 20. Therefore, these instructions do not work for systems running later versions of Ubuntu. Since JetPack 5 is the last version of JetPack to support Ubuntu 20 on Jetson devices, JetPack 6 and later versions must not be used for flashing the Jetson device.

Quick Start from Cloned Jetson Image

The fastest way to setup a new Jetson system is to flash a cloned image from a fully setup Jetson. For a full system setup, both the Jetson image and the SD card need to be copied. Cloned images for Jetson AGX Xavier and Jetson AGX Orin along with their SD cards are stored here:

- Cloned Image Location: \\dom1\Core\Dept\REDD\Groups\RQC\Projects\NIH_SLAM_R01\slamr01_jetson_img

Follow instructions to clone the Jetson image and SD Card:

- Clone / Restore Jetson Image
- Clone / Restore SD Card

The remaining instructions in this guide are for how to setup a new Jetson system from scratch.

Jetson OS Installation and Configuration

Follow instructions provided by NVIDIA to flash the Jetson processor with the Ubuntu 20 using the NVIDIA SDK Manager.

- Further instructions here: Jetpack SDK for Platform

Next setup the SD Card and some other base system configurations:

- Ubuntu 20 (Jetpack >=5.0 & < 6.0)

Setup further base system configurations:

- For semantic segmentation: PyTorch
- For audio device support: Bluetooth Install and Testing

Build Application Software

Install ROS:

- ROS Noetic (JetPack >=5.0.1)

Install RealSense Sensors

- Installation for Realsense Family Devices on Jetson

Build RTabMap and ROS wrapper for Mapping

- RTabMap Build (Ubuntu 20)

Build RTK / Puma and Capra ROS wrapper for Path Planning

- RTK/PUMA
- Capra ROS package

Build SLAMR01 Core Application

- SLAMR01 Core

Configure Development Environment

VS Code

On Ubuntu 20, VS Code may fail to run on the Jetson Xavier specifically (this problem does not happen on the Jetson Orin). The fix is to run vs code with sandbox disabled:

$> code --no-sandbox

You can create a new alias to do this automatically by adding to your .bashrc the following line:

echo "alias vscode='code --no-sandbox'" >> ~/.bashrc

Now use "vscode" command from terminal to start VS Code. Hurray!!