Installation

This project consists of two different codes package, C++and Python, and requires the installation of dependencies for both C++ and Python.

Suggestion Operation System

- Ubuntu 22.04
- Ros2 humble

C++ Dependencies

- ROS2
- PCL
- OpenCV
- Iridescence
- GLFW (zlib/libpng license)
- gl3w (Public domain)
- Dear ImGui (MIT license)
- ImGuizmo (MIT license)
- implot (MIT license)
- Eigen (MPL2 license)
- portable-file-dialogs (WTFPL license)

Python Dependencies

- Pytorch
- MobileSAM
- timm

Install C++ dependencies

```
# Install dependencies for Iridescence
sudo apt-get install -y libglm-dev libglfw3-dev libpng-dev libjpeg-dev libeigen3-
dev libboost-filesystem-dev libboost-program-options-dev

# Install Iridescence for visualization
##Option1, copy the iridescence attached with this software (under the path
"~/MIAS-LCEC/bin/iridescence") to your computer.
mkdir iridescence/build && cd iridescence/build
```

```
cmake .. -DCMAKE_BUILD_TYPE=Release
make -j$(nproc)
sudo make install
##option2, download iridescence.this method might have some problem if iridescence
updated.
git clone https://github.com/koide3/iridescence --recursive
mkdir iridescence/build && cd iridescence/build
cmake .. -DCMAKE_BUILD_TYPE=Release
make -j$(nproc)
sudo make install

# in some case the zvision can't find iridescence package, please add the
/usr/local/lib into the ld.so.conf using below command
sudo vim /etc/ld.so.conf

# make the config into effective
sudo /sbin/ldconfig -v
```

Install Python Environments

A new environment must be created and all the dependencies shall be installed under this environment, this document use pytorch_env as the environment name , users can change this environment name

```
# Install miniconda3
# download Miniconda3-py39_4.12.0-Linux-x86_64.sh from website
bash Miniconda3-py39_4.12.0-Linux-x86_64.sh

# create and activate pytorch environment
# make sure the python version consistent with the python version of ROS2
conda create -n pytorch_env python=3.10
conda activate pytorch_env

# install pytorch and cuda in the pytorch environment
# make sure the cuda version keep consistent in below two commands
# make sure the Nvida driver is installed correctly
nvidia-smi
conda install pytorch==2.1.0 torchvision==0.16.0 torchaudio==2.1.0 pytorch-
cuda=11.8 -c pytorch -c nvidia

# install pytorch for CPU if Nvidia display card is not available
## Option 1
conda install torch
## Option 2
pip install torch
## Option 3
pip install torch-2.1.2+cpu-cp310-cp310-linux_x86_64.whl

# install MobileSam
# option1:download MobileSam and run below command
cd ~/MIAS-LCEC/bin/MobileSAM
pip install -e.
```

```
# option2
pip install git+https://github.com/ChaoningZhang/MobileSAM.git

# install timm/pyautogui/pygame
pip install timm
```

Download and configure MIAS-LCEC

Download MIAS-LCEC from GitHub and configure the environment path of the program.

```
# clone git source
cd ~
git clone https://github.com/ZWhuang666/MIAS-LCEC.git
cd ~/MIAS-LCEC/

# activate your conda environment and make the configurtaion
conda activate pytorch_env
python config.py
```

If correctly operated, the file **"*~/MIAS-LCEC/bin/python/config.json*"** will be like:

```
{
    "path": {
        "ros": "/bin/python",
        "conda": "your path to conda/envs/pytorch_env/lib/python3.10/site-
packages",
        "sam": "~/MIAS-LCEC/bin/MobileSAM",
    },
    "Debug": {}
}
```

Please make sure to do ***conda activate [your conda path]*** before tapping ***python config.py***. If the program failed to run python code, please check your conda environment path using:

```
conda env list
```

and write the correct path to **"*~/MIAS-LCEC/bin/python/config.json*"** manually.