# Robot Learning and Vision for Navigation
## Exercise 0 – Introduction

Release date: Monday, 23 January 2023 - **Deadline for Homework: Wednesday, 25 January 2023 - 21:00**

### a) Blackboard:

- We will organize the exercises sheets and your submissions using the **Blackboard**-System (`https://learn.bu.edu`).

- If you have any questions regarding the exercises, please ask at the **Discussion Forum**.

- Please upload – although you get no points this time – your solution for the tasks below into Blackboard, to familiarize yourself with the system.

### b) Submitting your solutions:

- Please compress your submission using the ZIP format and *only* include necessary files.

- Please pack all files in this exercise into a ZIP file and upload it to the Blackboard system. Please rename the ZIP file to your name.

- We will provide a template for most tasks to avoid potential confusions. Please follow them to ensure a smooth procedure.

### c) Infrastructure:

- You are eligible to use the Shared Computing Cluster (SCC) cluster. All students in the class will be automatically enrolled in an SCC account. Please read the cluster documentation for more details (`http://www.bu.edu/tech/support/research/system-usage/scc-quickstart/`).

# Exercises

## 0.1 SCC Setup (0 Points)

We recommend using the SCC desktop version for a better interactive experience. For more details, you can refer to https://www.bu.edu/tech/support/research/system-usage/connect-scc/scc-ondemand/.

a) Read the cluster documentation and log in to the cluster after you get the account.

b) Apply for a desktop in Interactive Apps with 4 cores and 1 GPU, and load python3/3.8.3, libjpeg-turbo/2.0.4, and any other modules which you think is useful.

c) Connect to your desktop and you are now having a remote computer with powerful computing resources!

## 0.2 Anaconda Installation (0 Points)

To ensure a working environment, we ask you to install and create an Anaconda environment on your machine:

a) It is recommended to manage your Python environment with Anaconda. Please install Anaconda following instructions at https://www.anaconda.com/download/.

b) Create and activate your own environment by *conda create -n < your_env_name > python=3.7*. You can choose any other python version > 3.7.

c) Install PyTorch following instructions at https://pytorch.org/get-started/locally/ in your environment.

d) We ask you to run the toy regression code `exercise_pytorch.py` we provided. Please save the output log in the terminal as a `.txt` file.

## 0.3 CARLA Simulator Installation (0 Points)

In most of our homework, we use CARLA as our environment:

a) Read documents and get to know what CARLA is and what can it do https://carla.org/.

b) Download ubuntu version CARLA 0.9.10.1 (development) from https://github.com/carla-simulator/carla/releases. In order to avoid bugs caused by version inconsistencies, we restrict the CARLA version to 0.9.10.1.

c) Unzip your CARLA, cd to your CARLA directory, start your carla-server by running *DISPLAY= ./CarlaUE4.sh -opengl*. Note: it is okay to have error messages like "Disabling core dumps." or "error: XDG_RUNTIME_DIR not set in the environment." as long as it is still running.

d) Open a new terminal, activate your conda environment and import CARLA by :

```
1  export CARLA\_ROOT=YOUR_CARLA_DRECTORY
2  export PYTHONPATH=$PYTHONPATH:$CARLA_ROOT/PythonAPI/carla
3  export PYTHONPATH=$PYTHONPATH:$CARLA_ROOT/PythonAPI/ ↲
        ↳ carla/dist/carla-0.9.10-py3.7-linux-x86_64.egg
```

then run the toy manual control code `manual_control.py` under "YOUR_CARLA_DRECTORY/PythonAPI/examples". You are supposed to use ↑↓←→ to control the car in a simulated driving environment. Please make screenshot and compress to your submission YOUR_NAME.zip.