

VDC

Installation

- We install **Anaconda** which is the one of the package managers to handle different environments. we can install any one of the them for creating the environments.
- By searching the anaconda on your browser tab and downloading the version of the anaconda either for 32-bit version or 64-bit version.

Create an Environment

- we open the anaconda prompt from the search box. Change the location of the directory in the prompt to "**VDCSummercamp**" folder.
- Now, We create an environment with required packages to run the VDC by typing the command:

```
conda create -n <"Name of your environment"> python=3.6 -y
For example,
conda create -n vdc python=3.6 -y
```

- We activate the python environment which was created now. By typing the command:

```
conda activate <"Name of your environment">
For example,
conda activate vdc
```

- Now we will open the "**Dependencies.txt**" file in the vdc summercamp folder and type this command in order shown in the "**Dependencies.txt**" file. By typing the command in the prompt:

```
conda install pandas==1.1.3 -y
```

- In the same way, we install all the packages necessary to run the vdc.

Data collection

- To make the vdc car to run autonomously we have to collect the data.
- To collect the data open the simulator. we have two simulators - **beta simulator**, **Default Windows dekstop 64-bit**.
- It will open the prompt and click ok in it.
- It will show the two options such as **Training mode** and **Autonomous mode**. At same time select the one of the tracks shown below. As we are going to collect the data we

click on the **training mode** and it shows the track which you have selected earlier.

- Now we can start collecting the data by clicking on the record which was placed to the right side of the screen.
- It will open another screen where we will create a folder in the location we want.
- Now by using the keys

w - forward

s - backward

a - left

d - right

- we will run the car using the above mentioned keys to run the car on the track for atleast 5 laps.
- The data will be stored in the location we have mentioned earlier when we click on the record button.

Training the data

- Now we will find the location of the folder in which you collected the data.
- Open the file "**TrainingSimulation.py**" which was present in your vdc folder.
- Go to the line which says "**path**" in the file which is below the "**step 1**" and copy the location of your dataset folder and paste it there.

```
path = "< paste the path of your dataset folder>"
```

- In windows 11, You can copy the path of the dataset folder by right clicking on the folder and click copy as path. paste the copied path in the above "**path**" line which was mentioned in the 3rd step.
- Now scroll down the file and find step 10. Here we name the model to which the trained model will be named after.

```
model.save("<Name your model>.h5")  
For example,  
model.save("model.h")
```

- Now we will run the "**TrainingSimulation.py**". To run the "**TrainingSimulation.py**" we go to the anaconda prompt and check whether we have activated our environment if not activate the environment by typing the command:

```
conda activate <"name of your environment">  
For example,  
conda activate vdc
```

- Now we to train our neural network architecture by typing the command:

```
python TrainingSimulation.py
```

- Now your architecture get trained on the dataset provided by you.
- It will save the trained model with the name given by you in the **step 10** of the "**TrainingSimulation.py**" file.
- Now your model has been saved in the vdc folder with the name that you have given eariler. we will test our model so that we can understand how well the model has been trained and if not we collect the data again by following the above data collection steps.

Testing our trained model

- To test our model we go to the file named "**TestSimulation.py**" which was in the vdc folder open that file and scroll down to that file where you will find this line:

```
model = load_model("<Name your model>.h5")  
For example,  
model = load_model("model.h")
```

- Change the name of model present in it with the name of our trained model.
- Now open the simulator and select the track on which you have collected the dataset.
- As our goal is to run the car autonomously, we will select "**autonomous mode**".
- In the anaconda prompt, we will run the file "**TestSimulation.py**" by typing the command:

```
python TestSimulation.py
```

- Now check the simulator as the car starts to run autonomously on the track based on the data that you have collected.