Tutorial on Applying Reinforcement Learning to the Particle Accelerator ARES

You can view the tutorial notebook as HTML slides here.

Download the repository

Get the repository with Git

You will need to have Git previously installed in your computer. To check if you have it installed, open your terminal and type:

```
git --version
```

Git installation in macOS

```
brew update
brew install git
```

Git installation in Linux

In Ubuntu/Debian

```
sudo apt install git
```

In CentOS

```
sudo yum install git
```

Downloading the repository

Once you have Git installed open your terminal, go to your desired directory, and type:

```
git clone https://github.com/RL4AA/rl-tutorial-ares-basic.git
```

Then enter the downloaded repository:

```

```

```
cd rl-tutorial-ares-basic
```

Get the repository with direct download

Open your terminal, go to your desired directory, and type:

```
wget https://github.com/RL4AA/rl-tutorial-ares-
basic/archive/refs/heads/main.zip
unzip main.zip
cd rl-tutorial-ares-basic
```

Getting started

You need to install the dependencies before running the notebooks.

Install `ffmpeg`

Please also run these commands to install `ffmpeg`:

- OS X: `brew install ffmpeg`
- Ubuntu: `sudo apt-get install ffmpeg`

Using conda

If you don't have conda installed already and want to use conda for environment management, you can install the miniconda as described here.

- Create a conda env from the provided env file `conda env create -f environment.yml`
- Activate the environment with `conda activate rl-icfa`
- Additional installation steps:

```
python -m jupyter contrib nbextension install --user
python -m jupyter nbextension enable varInspector/main
```

- **After the tutorial** you can remove your environment with `conda remove -n rl-icfa --all`

Using venv only

If you do not have conda installed:

Alternatively, you can create the virtual env with `venv` in the standard library

```
python -m venv rl-icfa
```

and activate the env with $ source /bin/activate (bash) or C:> /Scripts/activate.bat (Windows)

Then, install the packages with pip within the activated environment

```
python -m pip install -r requirements.txt
```

Finally, install the notebook extensions if you want to see them in slide mode:

```
python -m jupyter contrib nbextension install --user
python -m jupyter nbextension enable varInspector/main
```

Now you should be able to run the provided notebook.

Running the tutorial

After installing the package

You can start the jupyter notebook in the terminal, and it will start a browser automatically

```
python -m jupyter notebook
```

Alternatively, you can use supported Editor to run the jupyter notebooks, e.g. with VS Code.