Computational Intelligence TORCS Assignment Technical Instructions

Fall 2017

1 Creating your own driver

To create your own driver, clone (using https) or fork the repository with the example client: `https://www.github.com/mpvharmelen/torcs-client`. The README file will specify which file you can use to start writing your own driver. Your driver will be run using Anaconda 5.0.0 for Python 3.6[1], which means you can use as many packages as your heart desires.

Alternatively, you may use a different programming language at your own risk. The only requirements are as follows:

- You must supply a bash script named `start.sh` that runs your driver.
- This bash script must connect to the port specified on the command line, in the following form: `start.sh -p <port>`, where `<port>` will be replaced by a value between 3001 and 3010.
- It must connect *within 5 seconds*. If it does not, you will be put at the end of the queue and the next team in the queue joins the race instead.
- After connecting, the script must reply to a received car state *within 10 ms*, otherwise the previously received reply is used.

The SCRC download page in Section 6 points to driver implementations in different languages. To check whether your driver will run on the server, try running it on the server image available from `http://ci-torcs.labs.vu.nl/`. The server is configured with root password `torcstijdelijkwachtwoord` and a sudo-enabled user `oneadmin` with the same password. **NOTE:** the image URL is available only from the VU network.

[1] `https://docs.anaconda.com/anaconda/packages/py3.6_linux-64`

2 Testing

2.1 Installing the controller

The easiest way to test if your driver will work on the server, is to download to provided image of the server and run your client from it. **Be sure to login as root.** To get you files on the server image, you can login to Dropbox by running `/root/.dropbox-dist/dropbox.d` (from the terminal) and following the displayed instructions.

To install TORCS on your own system instead, download the correctly patched TORCS installation files (`torcs-1.3.7-patched.zip`) from Blackboard and install the race controller from https://www.github.com/mpvharmelen/torcs-server, following the instructions in the README.

TIP: you can clone the repository using https (`git clone https://github.com/mpvharmelen/torcs-server.git`, this is also how the race server was configured). Like that you can update the controller by running `git pull` from within the repository directory, instead of downloading it again.

2.2 Running a test

To run a test, first download the two configuration files from Blackboard. Make sure to **save the XML file somewhere the full path of the file does not contain spaces**. Next, in the YML file, set the player working directory to your team folder and specify where you saved the XML file. Open a terminal and `cd` into the root of the `torcs-server` repository and run `./torcs_tournament.py path/to/quickrace.yml` to start a race.

3 Handing in

To hand in your driver every team will receive an invitation for a shared Dropbox folder, called your team folder. All files in your team folder will be synced with the race server. The driver started by `start.sh` will be run and graded.

Every twenty minutes the race server will race teams according to the "last modified" property of your `start.sh` file: the ten teams that have not changed their start script the longest will be allowed to join. After each (successful) race, the last modified time of the `start.sh` files of the teams that joined will be set to the current time, effectively putting them at the end of the queue.

4 Results and output

The results of every race are saved to a directory called `output` in you team folder in XML format. The file name contains the name of the driver your team was in this race, typically `scr_server` followed by a number. This number specifies in which position you started the race.

The command line output of your driver will be saved to the files named `{timestamp}-stderr.txt` and `{timestamp}-stdout.txt`. The output of the TORCS server (which is mostly not interesting) will be saved to your `output` as well, just so you can check whether everything went well.

If you plan to create new files or write to existing ones, keep in mind that your driver will run with your team folder as working directory. To access files in you team directory, use relative paths[2] instead of absolute paths[3].

5 Rating

All teams have a rating that will be used to grade your driver. Before the first race this rating is initialised at 1200. After every race the rating of all teams that joined will be updated according to the Elo rating system[4]. Because this is a two player system, race results are counted as a series of wins and losses: you lost from the players that finished before you and you one from the players that finished later than you.

At the moment, you cannot access your rating yourself, we're working on this.

5.1 Feedback

In `quickrace.yml` specify the path to your team directory and where you saved `quickrace.xml`.

6 Links

- Provided by this course:
  - Example Python 3 client: https://www.github.com/mpvharmelen/torcs-client
  - Controller implementation used to run the races: https://www.github.com/mpvharmelen/torcs-server
  - Image of the server used to run the races: http://torcs-image.labs.vu.nl
  - Correctly patched TORCS installation files (`torcs-1.3.7-patched.zip`): on Blackboard.
  - Training data: on Blackboard.
- official TORCS
  - homepage: http://torcs.sourceforge.net/index.php
  - FAQ: http://torcs.sourceforge.net/index.php?name=Sections&op=viewarticle&artid=30
- Very helpful blog: http://www.xed.ch/help/torcs.html

[2] starting with `./` or the name of whatever file you want to access
[3] starting with `/`
[4] https://en.wikipedia.org/wiki/ELO_ranking

- Simulated Car Racing Championship (SCRC) website:
  http://cs.adelaide.edu.au/~optlog/SCR2015/
  NB. Their software page is very useful and so is the manual on it. However, **the installation instructions in the manual are outdated**. If you want to install TORCS on your own system, please follow the installation instructions in the README on https://www.github.com/mpvharmelen/torcs-server