TORCS AUTOMATOR
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This program is about trying to develop technologies based on artificial intelligence for the automotive world. Although it's a fresh start, I already got good results in improving the time that a car spends on a circuit.
I developed a software that together with TORCS (The best Open Car Race Simulator) and artificial intelligence algorithms like "Hill climbing" and "Simulated annealing" improves the performance on the car gear box.
Basically, I run a lot of race simulations with different rpm values for each gear, values which are found by the artificial intelligence algorithms and then sent to the simulator. As the number of simulations increases, the time spent on the circuit should be smaller and smaller. I can't give you specific numbers for all the circuits because the results depend on a variety of factors, like the complexity of the circuit or the number of cars running against yours. What I can tell is that for some circuits the results are even better improved then by 30%. I encourage you to use the torcsAutomator and, see for yourself the results and even help in its development.

####### Installation #######

Before you can actually install the torcsAutomator software provided by me, you should install:
-Microsoft Office with Excel, I recommend version 2003 or 2007 as this are the ones that I tested.
-Torcs   version   1.3.1,   you   can   find   it   at   this   address
http://torcs.sourceforge.net/index.php?name=Sections&op=viewarticle&artid=3

Please install the above programs in the Program Files folder.

Next run torcsAutomatorInstaller.exe and the software package should be installed very fast and without problems. Just in case something goes wrong try to manually install following these steps:
-copy the client.exe and the content of the champ2011 folder into the torcs installation folder.
-also copy the algorithms from the algorithms folder in the same folder as above.
-create "Info" folder in the torcs installation folder.
-copy torcsAutomator.exe to the torcs folder.

####### Setup #######

To set up Torcs you need to go to its installation folder and run wtors.exe. Choose "Race" and after that "Quick Race". Now enter in the "Configure Race" menu and you'll be asked to choose the track (be aware that not all tracks may run). Next you'll get to add or subtract drivers from the race, at all times champ2011 should be racing(racing (it's you). I advise you not to add more than 2 other cars because the simulations may become very long. The following menu asks you the number of laps (1 in my case), in the display section choose "results only" as the simulations are faster. Navigate back to the menus and quit the application, do not close it directly as the options that you just set will not be saved.

####### torcsAutomator ######

Before getting started with the simulation you have to run torcsAutomator.exe. Here you'll find in the upper part of the program 2 tabs: Command and Options. Command tab consists of 3 buttons:
-Start: starts the simulation
-Stop Generation: stops the simulation after the current lap (generation)
-Stop Series: stops the simulation after the current series of simulations.

BE AWARE NOT TO MOVE THE MOUSE WHILE THE SIMULATION IS RUNNING AS IT MAY INTERFERE WITH IT !!!!

I ADVISE YOU TO USE AT LEAST A RESOLUTION OF 1400 BY 900 AS MANY WINDOWS WILL APPEAR AND DISAPPEAR DURING THE SIMULATION.

In my experience with the program i had to repeat a certain number of generations with the same options over and over again. Instead of doing this manually I introduced the concept of "series" which basically tells the program how many times to repeat the current number of generations. In the excel result file you'll find each series in a different sheet.

The options tab contains:
-Algorithm field: where you can choose from the available algorithms that I put at your disposal.
-Generations field: where you set up the number of generations.
-Series field: the number of series to be simulated.
-Name field: here you can chose the name of the excel results file.
-Send Options button: validates the options that you entered.

Be aware that you must push the "Send Options" button for the options to be saved and used in your next simulation.

While running the simulation you can see the elapsed time, and the estimated time until completion (not very accurate   ).

In the bottom part there's a message box where results, errors and the current status of the program is shown.

####### Results #######

You can find the results files in the "Info" folder of Torcs. In order to understand the data shown here, you need to know:
-"Up 1-2" column contains the rpm values at which the gearbox changes from gear 1 to gear 2.
-"Down 1-2" column contains the rpm values at which the gearbox changes from gear 2 to gear 1.
-The "Optimus" column contains the best time obtained before the current result.
-The "Result" column contains the actual time obtained by the car with the rpm values on that line.

-"Min" is the best result obtained in that series.
-"Max" represents the worst result obtained.
-"Avg" is the average of all the results in the series.

You can test your own values by changing the values in the viteze.txt file, and by choosing 1 generation and 1 series. Note that the 6'Th. and the 7'Th. values must always be 0, and that the other values must be bigger than 0 and smaller than 8000.

If you can't open the Excel files directly, try to open Excel first and then open the result files by dragging and dropping them in the Excel window.

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