README

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The NEVs-DP software is developed by Shanghai Jiao Tong University to solve the Dynamic Programming (DP) problems of New Energy Vehicles (NEVs). This document will briefly introduce how to use this software. Specific algorithm principles, please refer to the two papers [1,2].

1. Computation Platform

The software has been tested on the Windows system. The details are as follows.

Operating System: Windows 7 64 bits

MATLAB: MATLAB 2015b 64 bits

There are no special toolboxes required in MATLAB. If you want to use this software on the Linux system or other operating systems, please modify this file: ***OS_Selection.m***.

2. Software Architecture

This software package is composed of six folders. The details are as follows:

- ***+VehParameters***: Store vehicle parameters, such as parameters of Electric Vehicles (EVs);

- ***+VehFactory***: Store vehicle component models, such as vehicle battery, energy, gearbox, motor;

- ***+ResultData***: Store calculation results;

- ***+Example***: Some typical cases are given to show how to use this software;

- ***+CycleData***: Collect a variety of driving cycles;

- ***+Discussions***: Visualization analysis of calculation results.

3. Instructions for the use of Example

In the Folder named ***+Example***, four different examples are given to show how to use this software, as shown in Table 1. For more details, please refer to the literature [1,2].

Notes: In Table 1, SJTU DP refers to the method proposed by Shanghai Jiao Tong University [1,2].

4. Others

You should have profound skills in MATLAB programming, object-oriented programming, vehicle dynamics theory, and you should also be familiar with the concept of DP. Before starting to use the NEVs-DP software, you should have read the corresponding publications [1, 2, 3] and understand the examples provided in the NEVs-DP software package. If you have any questions at all, please feel free to ask us.

5. License

The NEVs-DP software package is subject to the terms of the Mozilla Public License, v. 2.0. If a copy of the MPL was not distributed with this file, you can obtain one at http://mozilla.org/MPL/2.0/.

Table 1 Case file descriptions

ID	Examples	Folder Name	Name of the Main M File	DP Method	Ref
1	EV	+EV_2S_IDSC	EV_2S_IDSC_Basic.m	Basic DP	[1]
2		+EV_2S_IDSC	EV_2S_IDSC_LevelSet.m	Level-Set DP	[1]
3		+EV_3S_SJTU	EV_3S_SJTU.m	SJTU DP	[1]
4	FCEV-1	+FCEV_2S_IDSC	FCEV_2S_IDSC_Basic.m	Basic DP	[2]
5		+FCEV_2S_IDSC	FCEV_2S_IDSC_LevelSet.m	Level-Set DP	[2]
6		+FCEV_2S_SJTU	FCEV_2S_SJTU.m	SJTU DP	[2]
7	FCEV-2	+FCEV_3S_IDSC	FCEV_3S_IDSC_Basic.m	Basic DP	[2]
8		+FCEV_3S_IDSC	FCEV_3S_IDSC_LevelSet.m	Level-Set DP	[2]
9		+FCEV_3S_SJTU	FCEV_3S_SJTU.m	SJTU DP	[2]
10	P2 HEV	+PHEV_3S_2U_IDSC	PHEV_3S_2U_IDSC_Basic.m	Basic DP	[1]
11		+PHEV_3S_2U_IDSC	PHEV_3S_2U_IDSC_LevelSet.m	Level-Set DP	[1]
12		+PHEV_3S_2U_SJTU	PHEV_3S_2U_SJTU.m	SJTU DP	[1]
13		+PHEV_3S_6U_SJTU	PHEV_3S_6U_SJTU.m	SJTU DP	[1]

References

[1] *Research on modeling and solving of Dynamic Programming for New Energy Vehicles based on their work modes. Part I: Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs).*

[2] *Research on modeling and solving of Dynamic Programming for New Energy Vehicles based on their work modes. Part II: Fuel Cell Electric Vehicles (FCEVs).*

[3] *Zhou W, Ying T, Yang L, et al. Design of an intelligent driving system simulation platform and its application[C]// Computational Intelligence. IEEE, 2018:1-7.*