ANN_GSA_Tool

Version 1.0

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Quick Guide

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Contents

1. Install MATLAB

   We recommend to install 2015b or higher version of MATLAB.

2. Run a testing example

   Open the main interface of ANN_GSA_Tool by entering "*ANN_GSA_Tool*" on the command window of MATLAB.

   Figure 1 is the main interface of the ANN_GSA_Tool 1.0

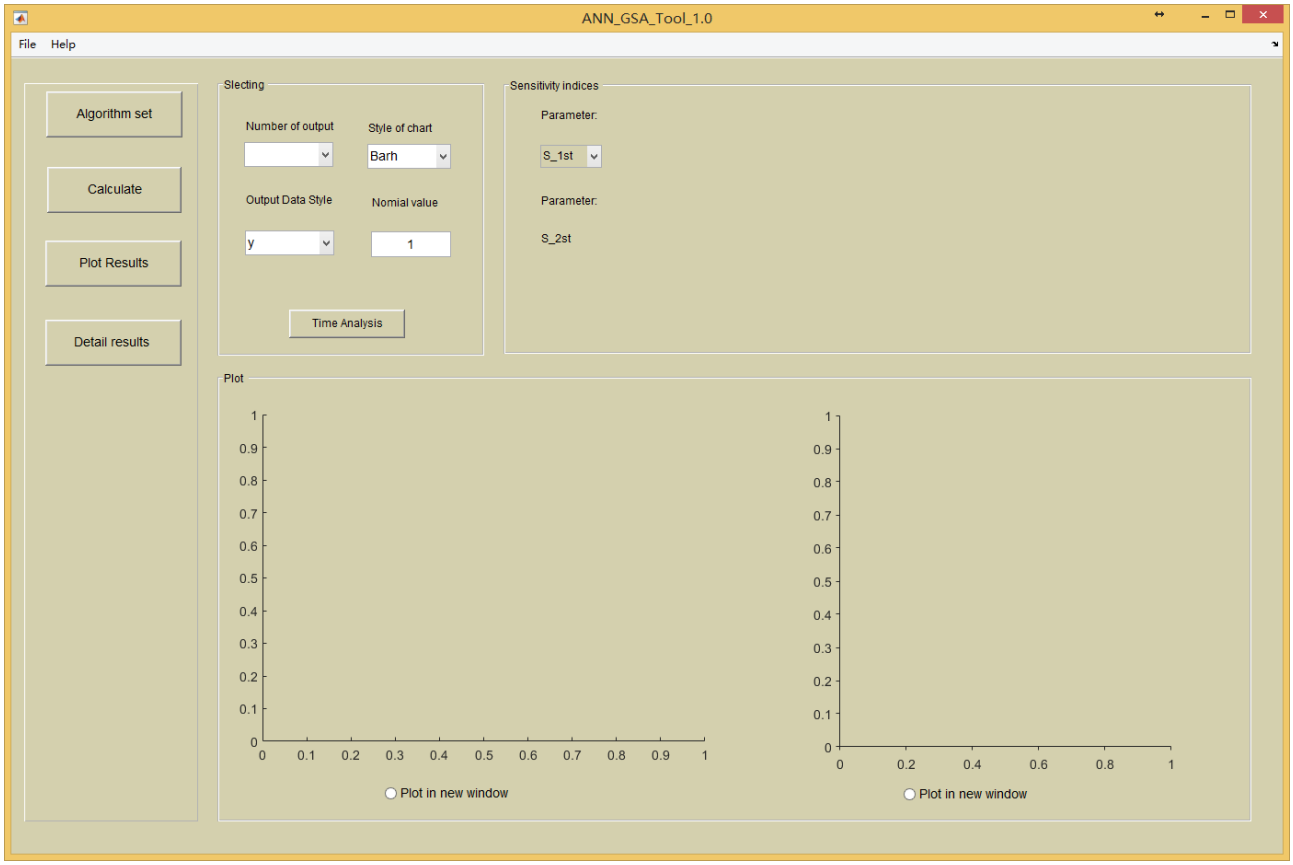

Fig. 1. The screenshot of the main interface of the ANN_GSA_Tool 1.0

2.1 Open the input and output files for global sensitivity analysis (GSA)

TestData folder contains testing data for GSA, *HDMR_input.txt* is the input file and *HDMR_output_P1atm_Ln.txt* is the output file.

From the main interface, open the input file by clicking *File → InputFile Open*, and choosing the file *HDMR_input.txt;* open the output file by clicking *File → OutputFile Open*, and choosing the file *HDMR_output_P1atm_Ln.txt.*

2.2 Set the algorithm parameters

Click the button "Algorithm set" on the main interface to open the algorithm setup window.

For example, the algorithm parameter values are set as shown in the Fig. 2.

Fig. 2. The screenshot of the *algorithm setup* window

2.3 Conduct global sensitivity analysis

Click the button “Calculate” on the main interface to calculate global sensitivity indices.

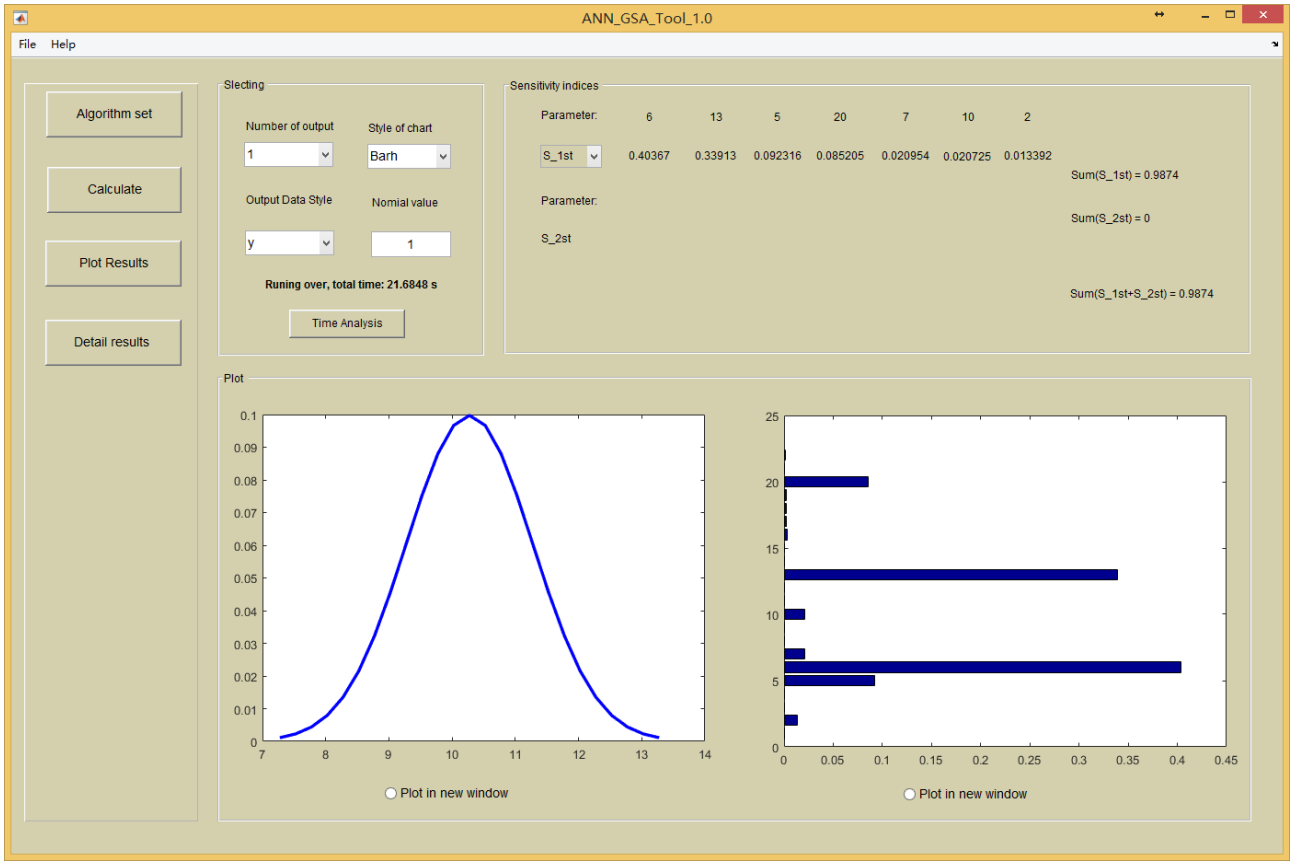

Fig. 3. The screenshot of the main window after calculating the global sensitivity indices

2.4 Check the accuracy of the surrogate model constructed by ANN

Click the button “Plot Results” on the main interface to check the accuracy of the surrogate model constructed by ANN

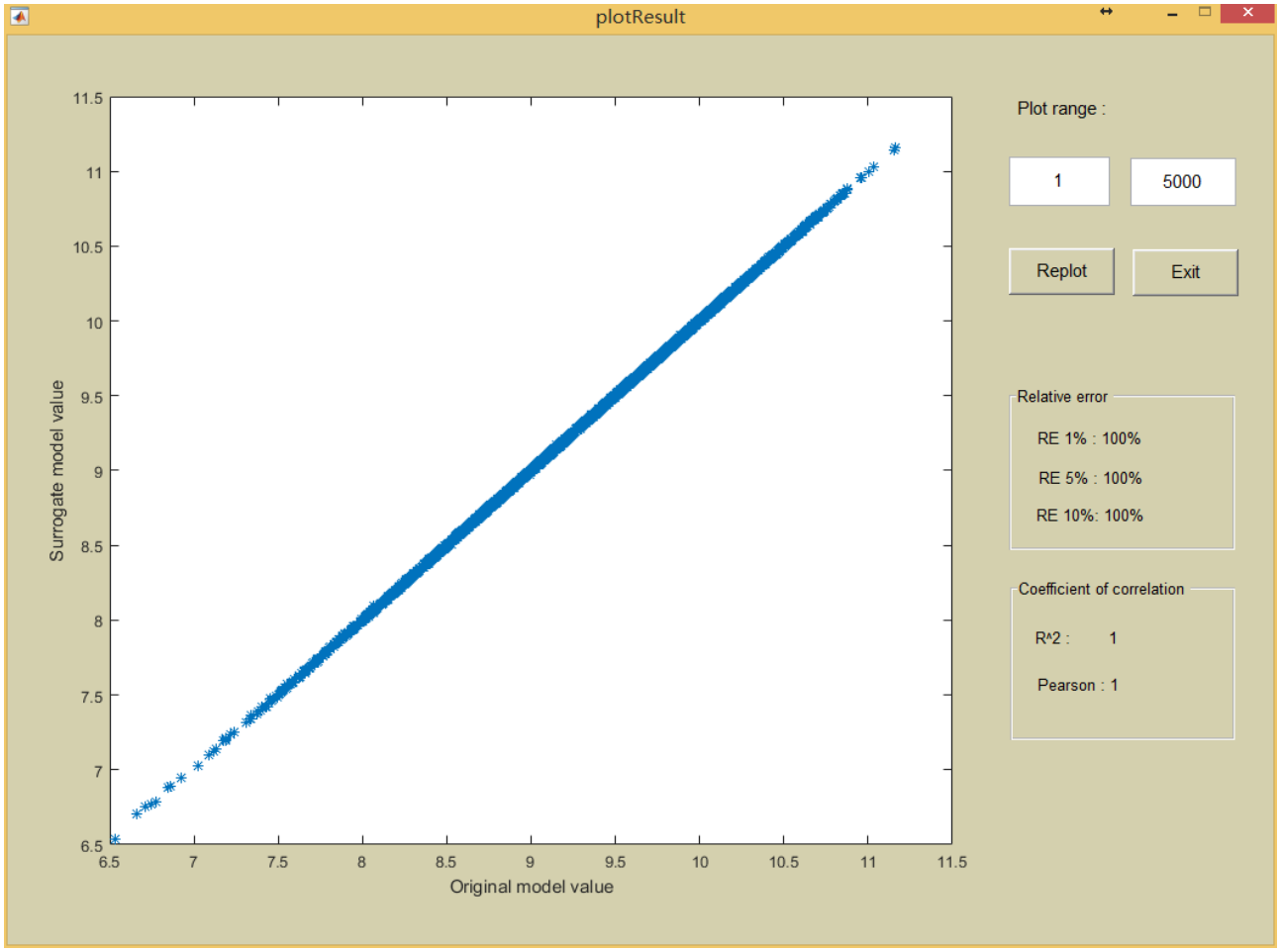

Fig. 4. The screenshot of the *plotResults* window

2.5 Get more information from the results

Click the button "Detail results" on the main interface to get more information which includes more sensitivity and uncertainty results, and the plots of the first and second order component functions.

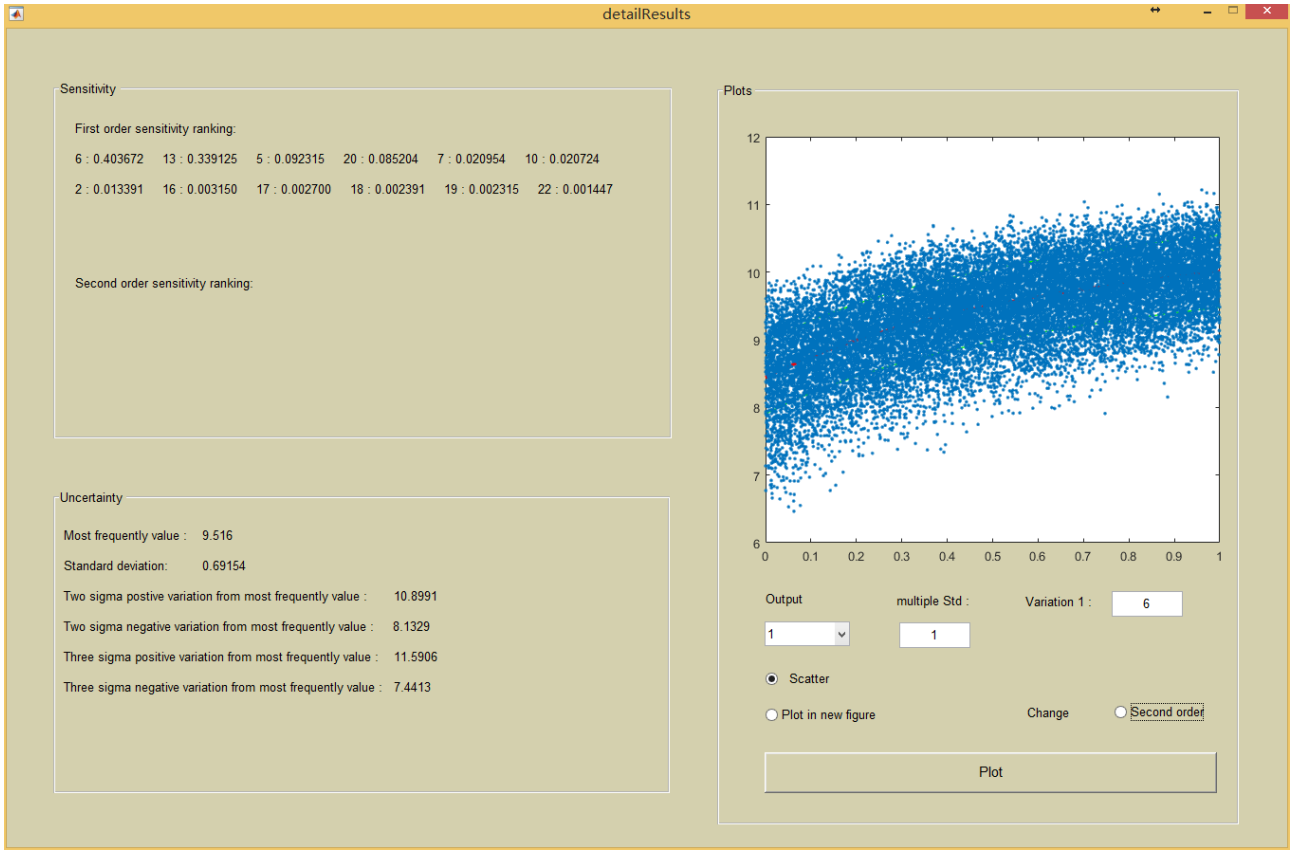

Fig. 5. The screenshot of the *detailResults* window

2.6 Save results

The sensitivity results are saved in the *SensitivityResults* folder.

Notices:

This is just a Quick Guide for users who want to use this program, and the complete user's manual will be finished in the future. This program will be continuously improved. Please contact us if you want to get the lasted version of this program, or if you find some bugs of this program.