

Manual for Setting up the Pattern-oriented Parameter Specifier (POPS)

In its current form, POPS is a compilation of Matlab files. In other words, you need a licensed version of Matlab installed on your computer to be able to conduct a parameter search using POPS.

1. Getting the POPS compilation

You will need the zipped file package POPS.zip. The package is available in the electronic companion of the chapter. Apart from that, the most recent versions of this zip file can be obtained from the following web page: <http://www.gyucel.net/research/POPS.html>

2. Setting up POPS

As a first step, unzip POPS.zip to a folder on your computer. You should have two subfolders named '*models*' and '*recognizer*'. Besides there should be three .m files; '*controller*', '*fitness*', and '*optimizer*'. You will be editing these three .m files in order to setup a parameter search.

controller.m: As the name implies, this file is the main controller of the search process. There are three parts you may want to change in this file;

- *noVar* (line 5 of the file) is the number of variables for which you will be conducting a value search.
- In line 16, you may specify the output file to store the results of the search process.

fitness.m: In this file, you specify the simulation model for which you are conducting the parameter search. The model should be located in the '*models*' subfolder. Then, you should indicate the name of the model in *line 9* of the *fitness.m* file.

optimizer.m: This is the file that specified the genetic algorithm that conducts the search process. Some parts of the file should be customized for each search. Some others are optional, and should be changed only if you have an idea about the way genetic algorithms function in general. Parts that should be updated are as follows;

- *Line 8*: Number of parameters for which you are conducting the parameter search
- *Line 16*: Lower bounds for the feasible range of parameters
- *Line 17*: Upper bounds for the feasible range of parameters

3. Preparing your model for POPS

In its current form, POPS is unable to work with models developed using widely used system dynamics software (e.g. Vensim, Stellas, Powersim, etc.). Therefore, models should be converted into a Matlab file. Two examples are given in the '*models*' subfolder. Model01.m file corresponds to the test model described in the chapter.

4. Running POPS

In order to run POPS, you have to enter the following command in the Command Window of Matlab; "*controller('noRep')*". *noRep* is the number of replications you want in the search process. Since the search process is probabilistic, it is possible to find different points that yield to the desired behavior in different replications. For example, if you wish to repeat the search for 30 times, the command should look like this; ***controller(30)***

The results, which include the final parameter values in all replications will be stored in a .mat file in the same folder you have POPS files.