Readme for model and algorithm code in “Parameter Calibration in Global Land Carbon Models using Surrogate-based Optimization”

The codes are divided into three folders: MCMC, GlobalOptimization and SurrogateOptimization.

The MCMC folder contains the scripts and code of the Bayesian MCMC approach and three models. In fact, this part of code is programmed by Hararuk et al and can be downloaded at http://ecolab.ou.edu/download/MCMC.php

The GlobalOptimization folder contains four global optimization algorithms (DE, PSO, CMA-ES and SCE-UA) code and three carbon model code and dataset. Each global optimization algorithm is programmed as a matlab function file named with the algorithm name (DE.m, PSO.m, SCEUA.m, CMAES.m). The three model file are almost the same as the model code in the MCMC folder. I just wrap the model codes to functions and make them easier to be used by algorithm function. The detail of function parameters can be found in the code comments. The “run.m” is an example to use the function.

The SurrogateOptimization folder contains the script to run surrogate-based optimization algorithms (run.m) and three model file. I use the “Surrogate Model Optimization Toolbox" and you should add this toolbox path to the matlab path before you start. The toolbox can be downloaded at https://cn.mathworks.com/matlabcentral/fileexchange/38530-surrogate-model-optimization-toolbox. The “datainputCarbon1.m” , “datainputCarbon2.m” and “datainput Carbon3.m” are the wrapper of three carbon models for this toolbox. The “run.m” is an example script.

If you have any problem or question when using my code, please feel free contact me by email: ocean920329@gmaili.com