Notes of F. Boulouvala 2015 paper

Jianqiu Wang

January 11, 2017

Introduction

- Grey-box problem: A combination of constrains or objective functions with known and unknown functional forms
- Why not deterministic global optimization: high computational cost, unreliable derivative information from noise, discontinuity of obj fcn/constraints, and lack of model equations if only given input-output data (Would it be similar to financial time series data?)
- Promising approach: surrogate approximation models for unknown equations of system.(Through which we may apply derivative-based optimization).
- Why global optimization of surrogate model necessarry: Usually the most efficient surrogate functional forms are multimodal (with serveral peaks)
- How we treated: Compilatioon of determnistic global optimization subproblems with sampling and design of experiments, parameter estimation and global optimization of surrogate formulations.
- 3 important questions: 1. Variability of initial sample points would affect consitensy of grey-box algorithm(Consistency?) 2. Using deterministic global optimization is important, why? 3. Selection of surrogate function?

Problem Formulation and Literature Review