



Renseignements détaillés

Use of surrogates in derivative-free optimization

Détails de la recherche

Année de concours :	2012	Année financière :	2012-2013
Nom de la personne :	LeDigabel, Sébastien	Institution :	École Polytechnique de Montréal
Département :	Mathématiques et génie industriel	Province :	Québec
Montant :	26 000	Versement :	1 - 5
Type de programme :	Programme de subventions à la découverte - individuelles	Comité évaluateur :	Génie civil, industriel et des systèmes
Sujet de recherche :	Optimisation	Domaine d'application :	Génie
Chercheurs associés :	Aucun associé	Partenaires :	Aucun partenaire

Sommaire du projet

The research project described in this proposal concerns derivative-free optimization (DFO). More precisely, it focuses on blackbox optimization, which occurs when the objective(s) and constraints of an engineering optimization problem are obtained by a computer code seen as a blackbox. Several characteristics make these codes impractical for optimization: they may be expensive to evaluate, be contaminated with noise, or fail to return a value. No derivative information is available and even approximations can not be exploited for the optimization. In this context, derivative-based methods cannot be used, and DFO methods may be considered. The present proposal discusses extensions of the mesh adaptive direct search (MADS) method, and in particular the use of surrogates to improve its efficiency. My research is equally divided into three categories: algorithmic developments, optimization software design, and applications. The present application proposes six projects in the first category. Support for the two other categories has been requested from other organizations. Most of these six projects concern the use of surrogates within a direct search framework. Each project, in terms of objectives and time frame, has been specifically defined for an MSc or PhD student. As a consequence, approximately 86% of the requested budget is devoted to graduate-student salaries.