Mathematics > Numerical Analysis

Finding saddle points of mountain pass type with quadratic models on affine spaces

C.H. Jeffrey Pang

(Submitted on 21 Jul 2011 (v1), last revised 19 Nov 2012 (this version, v2))

The problem of computing saddle points is important in certain problems in numerical partial differential equations and computational chemistry, and is often solved numerically by a minimization problem over a set of mountain passes. We propose an algorithm to find saddle points of mountain pass type to find the bottlenecks of optimal mountain passes. The key step is to minimize the distance between level sets by using quadratic models on affine spaces similar to the strategy in the conjugate gradient algorithm. We discuss parameter choices, convergence results, and how to augment the algorithm to a path based method. Finally, we perform numerical experiments to test the convergence of our algorithm.

Comments:	This paper has been withdrawn because the important ideas have been poorly developed here. A new submission has since subsumed the material in this paper. 20 pages, 4 figures
Subjects:	**Numerical Analysis (math.NA)**
MSC classes:	35B38, 65F10, 65N12
Cite as:	**arXiv:1107.4287 [math.NA]**
	(or **arXiv:1107.4287v2 [math.NA]** for this version)

Submission history

From: Chin How Jeffrey Pang [view email]

[v1] Thu, 21 Jul 2011 14:41:01 GMT (119kb,D)

[v2] Mon, 19 Nov 2012 13:28:17 GMT (0kb,I)

Which authors of this paper are endorsers?