KKT Proximity Measure Versus Augmented Achievement Scalarization Function

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Abstract

KKT proximity measure (KKTPM) is used as a metric for obtaining how close we are to the corresponding Pareto-optimal (PO) point without any knowledge about the true optimum point. This metric uses a common scalarization method that guarantees to find any PO solution that is an achievement scalarizing function (ASF) method. Since that KKTPM formulation is based on augmented achievement scalarizing function (AASF) to avoid weak PO solutions. This paper studies the relation between KKTPM values and AASF values. Aim of this study to know the advantage and disadvantage of both measures. Also, this paper discusses some special cases to know the merits of both measures and to confirm that KKT proximity measure is an essential measure for convergence. In addition, this study investigates the correlation plot between these two measures for ZDT test problems, results show the difference in values and therefore cannot obtain a perfect correlation between KKTPM values and AASF values. Hence, it can be said that KKT proximity measure is better.

References


2012.

**Index Terms**

Computer Science  Applied Mathematics

**Keywords**

Multi-objective optimization, Exact KKT proximity measure, Direct KKT proximity measure, AASF approach