

Surrogate constraints methods for inconsistent linear feasibility problems

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Abstract

We consider the problem of finding an approximate solution of a large scale inconsistent linear system $Ax \leq b$, where A is an $m \times n$ real matrix and $b \in \mathbb{R}^m$. Problems of this kind appear in many applications, e.g. in the image reconstruction or in the intensity modulated radiation therapy (IMRT). It is known, that the surrogate constraints method (SC-method) converges to a solution if the system $Ax \leq b$ is consistent. We suggest a modification of the SC-method which converges also in case when the system is inconsistent.