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A modified Seidel method for calculating the fixed points of contractive mappings

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ABSTRACT.

For calculating the fixed point of a contractive mapping $\mathbf{f} = (f_1, f_2, ..., f_m) : \Omega \to \Omega,\ \Omega \in \mathbf{R}^m$ we employ a modified Seidel successive approximations scheme:

$$x_{\pi(k)}^{(n)} = f_{\pi(k)}\left(\widetilde{x}_1^{(n,k)}, ..., \widetilde{x}_{k-1}^{(n,k)}, \widetilde{x}_k^{(n,k)}, ..., \widetilde{x}_m^{(n,k)}\right),$$

where

$$\widetilde{x}_l^{(n,k)} = \begin{cases} x_l^{(n)},\ if\ l = \pi(s)\ and\ s < k, \\ x_l^{(n-1)},\ if\ l = \pi(s)\ and\ s \geq k. \end{cases}$$

We present a strategy to find the permutation π in order to accelerate the iterative processus.

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