ITERATIVE METHODS FOR LARGE-SCALE ILL-POSED PROBLEMS

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Large-scale ill-posed problems arise in many applications, such as image restoration and computerized tomography, and their solution by iterative methods is receiving considerable attention. In this talk we give an overview of available techniques and discuss new developments. In particular, we will show that iterative methods developed for the solution of well-posed problems, such as the GMRES, BiCG and QMR methods, also can be applied to the solution of ill-posed problems, provided that they are equipped with suitable termination criteria. Pseudo-preconditioning for ill-posed problems also will be discussed.

References

[1] D. Calvetti, B. Lewis, and L. Reichel, " Restoration of images with spatially variant blur by the GMRES method," *Advanced Signal Processing Algorithms, Architectures, and Implementations X* , ed. F. T. Luk, Proceedings of the Society of Photo-Optical Instrumentation Engineers (SPIE), vol. 4116, The International Society for Optical Engineering, Bellingham, WA, p. 364–374, 2000.