

Recent Developments of Low Rank Approximation of Matrices

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In this talk we survey recent essential developments [2, 3] of the ideas of low-rank matrix approximation proposed in [1]. The practical importance of the very approach consists in its paradigm of using only small part of matrix entries that allows one to construct a sufficiently accurate approximation in a fast way for "big data" matrices that cannot be placed in any available computer memory and are accessed implicitly through calls to a procedure producing any individual entry in demand. During the two recent decades the approach has become a powerful numerical instrument in a tremendous variety of applications. However, its theoretical grounds still invite the researchers to provide them a better look. We discuss the notable new findings and as well some perspectives and open questions.

References

- [1] S. Goreinov, E. Tyrtyshnikov, N. Zamarashkin, *A theory of pseudo-skeleton approximations*, Linear Algebra Appl. 261 (1997) 1–21.
- [2] A. Osinsky, N. Zamarashkin, *Pseudo-skeleton approximations with better accuracy estimates*, Linear Algebra Appl. 537 (2018) 221–249.
- [3] A. Osinsky, *Probabilistic estimation of the rank 1 cross approximation accuracy*, arXiv:1706.10285 (2017).