

Report on “**A Unified Treatment of Tractability for Approximation Problems Defined on Hilbert Spaces**” by O. Emenike, F. J. Hickernell and P. Kritzer.

The Authors consider (sequences of) linear solution operators on Hilbert spaces and their tractability expressed in terms of functions of their singular values. It turns out, as clearly demonstrated by the Authors, that this venue of research still yields interesting, if somewhat technical, results.

Main results of the paper are organised in Theorems 1–5. While Theorems 1 and 2 deal with (generalised) strong T-tractability and T-tractability respectively, subsequent theorems concern weaker notions of (generalised) T-tractability. That is, a certain generalisation of weak tractability is covered in Theorem 3, and general tractability on restricted domains is the substance of Theorems 4 and 5, with the former regarding strong versions of tractability. There is a sense of uniformity seen in all presented results, and it seems that the Authors indeed grasped a certain underlying structure which has lied hidden under many tractability theorems and their proofs established before. There is also a section with examples which relates the general notions from the paper to already established and well known notions of (classical?) tractability.

I support the publication of this work in the Journal of Complexity.

The Authors might consider/implement the following remarks.

- p 1: Remark on the definition of singular values: it is rather that “singular values of  $SOL_d$ ” denotes some set of numbers, not the vice-versa.
- p 1 par -2: “...conditions on the singular values that are easier to verify that are equivalent...”–? The whole sentence with these words is hard to understand.
- p 1 l -9: is a constant depending on a parameter a constant?
- It might be helpful for the general mathematical (and computer science) readership to include an example of a real nontrivial computational problem for which the theoretical apparatus presented in the paper provides some useful insights. Indeed, we see that this is the sole side on which this otherwise highly interesting paper is currently somewhat lacking.