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Pinkus, Allan

Continuous selections for the metric projection on C_1.

Constructive Approximation 4, No. 1, 85-96 (1988).

Let U be a finite dimensional subspace of $C_1(K)$, the continuous functions normed with the L_1 norm. K is a compact subset of R^n and equal the closure of its inerior. This paper proves that there is a continuous selection for the metric projection onto U only in the trivial case that U is a Chebyshev set. This tidy theorem for such a basic setting well supplements the few similar results in the literature for other spaces. In fact it is shown that if K is connected there does not exist a selection, s, for the metric projection such that even f_n converging uniformly to f does not mandate the convergence of $s(f_n)$ to s(f). The proofs involve a series of lemmas manipulating the characterization of best approximations in $C_1(K)$ and the substructures forced upon U by the existence of a continuous selection for the metric projection. *D.Wulbert*

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