E i n l a d u n g

In der Reihe „Chemnitzer Mathematisches Colloquium" der Fakultät für Mathematik der TU Chemnitz spricht

Prof. Dr. Gustavo Garrigos, University of Murcia (Spain)

über das Thema

N-term approximation by greedy algorithms.

Der Vortrag findet am

Donnerstag, dem 28. April 2022, um 16:00 Uhr, im Raum 2/N010

statt.

Ich möchte Sie hiermit recht herzlich zu dieser Veranstaltung einladen. Das Kolloquium wird von Herrn Prof. Dr. Tino Ullrich geleitet.

Abstract:
In N-term aproximation one attempts to approximate vectors f in a Banach space X with combinations of at most N elements from a fixed system $e_n{}_{n=1}^\infty$ (typically, a basis). Greedy algorithms select the approximations by maximizing suitable functionals; for instance, in the case of bases, by selecting the N largest coefficients in the basis expansion $f = \sum_{n=1}^\infty a_n e_n$. These procedures turn out to be (essentially) optimal for many problems, some of which are interesting in applications. For instance, when approximating functions (images) with wavelet-type bases using L^p-norms, for $1 < p < \infty$.

In this talk we will review some recent results from this theory, in relation with Lebesgue type inequalities. These quantify the efficiency of greedy approximations, compared with the best possible N-term approximation. We will present results for the standard thresholding greedy algorithm (TGA), and also for the so-called weak Chebyshev greedy algorithm (WCGA). In the latter case, we will present a recent join work with Dilworth et al concerning the number of iterations which are required to recover N-sparse vectors, and which improve previous bounds by Temlyakov (2014).

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We shall apply these results to derive new (optimal) bounds in two natural examples in which WCGA performs better than TGA. Namely, for wavelet bases in Besov spaces, and for the multivariate Haar system in L_p.

Prof. Dr. Daniel Potts
Dekan