THE GOOD, THE BAD AND THE RANDOM CUBES

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Ever since the early days of Calderón–Zygmund theory, the analysis of singular integrals has been about dividing cubes into good and bad collections, although their exact meaning has evolved from one application to another. Nazarov, Treil and Volberg introduced a new probabilistic method of dealing with the bad part in the context of singular integrals over non-homogeneous measures, and this was further elaborated in the dyadic representation theory behind the first solution of the A_2 conjecture on sharp weighted inequalities. I will survey some applications of the probabilistic good/bad decomposition and try to highlight the underlying general principles.