

Error Analysis for Multivariate and Infinite-Dimensional Integration with respect to different underlying norms

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We want to discuss upper and lower error bounds for numerical multivariate and infinite-dimensional integration. We study the setting where we are allowed to use randomized algorithms and the setting where we are only allowed to use deterministic algorithms; error criteria of interest are the randomized worst case error and the deterministic worst case error, respectively. To define the error precisely, we have to choose a norm on the function space of integrands. These norms rely often on function space decompositions as, e.g., the ANOVA or the anchored decomposition. As a (rough) rule of thumb, norms based on the ANOVA decomposition are favorable for the error analysis in the randomized setting while anchored decompositions are favorable for the error analysis in the deterministic setting. In this talk we would like to present some known results for numerical integration and discuss to what extent these results transfer to function spaces with different underlying norms. The talk is based on joint work with Jan Baldeaux, Josef Dick, Mario Hefter, Aicke Hinrichs, and Klaus Ritter.

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