Adaptive Finite Element Algorithms of Optimal Complexity

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Aiming for an optimal algorithm for solving numerically partial differential equations (PDEs), we are naturally led to the so-called adaptive method. Simply speaking, the task of an adaptive method is to adapt the approximation to the unknown solution of a differential equation during the solution process, using only a posteriori information, and to produce eventually the (quasi-) best possible approximation with optimal computational costs. Nowadays Adaptive Finite Element algorithms are being used to solve efficiently PDEs arising in science and engineering.

In this talk we present a detailed design of Adaptive Finite Element Algorithms and analysis of their convergence, convergence rates and computational complexity.

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