

An Introduction to the A Posteriori Error Analysis of Elliptic Optimal Control Problems

November 15th
2:00 - 3:30 pm
Room 305

November 17th
2:00 - 3:30 pm
Room 305

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We give a survey on adaptive finite element methods for optimal control problems associated with second order elliptic boundary value problems. Both unconstrained and constrained problems will be considered, the latter in case of pointwise control and pointwise state constraints. Mesh adaptivity is realized in terms of a posteriori error estimators obtained by using residual-type error control and/or by weighted dual residuals within the goal-oriented dual weighted approach. In order to make the exposition self-contained, we provide the basic concepts of residual-type and goal-oriented a posteriori error control for elliptic boundary value problems and then apply both concepts to unconstrained elliptic optimal control problems. Control constrained problems will be exemplarily treated within the residual-type a posteriori error analysis, whereas the case of pointwise state constraints will be dealt with by means of dual weighted residuals.

The results are based on joint work with Michael Hintermueller (Humboldt Univ. at Berlin) and Michael Hinze (Univ. of Hamburg).