Rolf Rannacher

Adaptive finite element discretization of optimal control problems

This talk summarizes recent developments in the numerical solution of PDE-constrained optimal control problems governed by adaptive finite element methods. Using the Euler-Lagrangian approach primal-dual weighted a posteriori error estimates are derived for the approximation of the cost functional or the controls. This approach, termed Dual Weighted Residual (DWR) method, uses linearization, Galerkin orthogonality and approximate residual evaluation to design efficient mesh adaptation strategies which are specially tailored to the needs of the optimization process. The applications discussed range from simple boundary control over parameter identification to model callibration.