**Numerical verification of optimality conditions for optimal control problems**
(joint work with Arnd Rösch, Universität Duisburg-Essen)

Abstract: In the talk a class of optimal control problem for a semilinear elliptic partial differential equation with control constraints is will be discussed. It is well known that sufficient second-order conditions ensure for instance stability of optimal solutions and convergence of numerical methods. Otherwise, such conditions are very difficult to verify (analytically or numerically). We will propose a new approach: Starting with a numerical solution for a fixed mesh we will show the existence of a local minimizer of the continuous problem. Moreover, we will prove that this minimizer satisfies the sufficient second-order conditions.

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