Scope of the proposed project is to develop efficient numerical methods for a class of mathematical programs with disunctive constraints. Prominent examples of such programs are given by equilibrium constraints or so-called vanishing constraints.
Existing methods for solving such problems can be shown to converge only under some restrictive assumption and it cannot precluded that they converge to points where spurious directions of descent exist.
Very recently the proposer has developed new stationarity concepts for the problem under consideration, which are based on generalized differentiation. The new algorithms shall rely on these new stationarity concepts and we want to prove global convergence properties under fairly mild assumptions. Further, superlinear convergence and the behaviour in the degenerate case are to be analyzed.
The new method has a similar structure as the well-known SQP method from nonlinear programming: In each iteration step an auxialiary problem is solved, where a quadratic objective function built by an approximation of the Hessian of the Lagrangefunction and the gradient of the objective, is minimized over the linearization of the constarint. Then a search is performed along the arc computed when solving this auxiliary problem in order to reduce a suitable merit function.