A nonsmooth Newton-type method for MPCCs

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We show that the M-stationarity system associated with a mathematical program with complementarity constraints (MPCC) can be equivalently written as a system of discontinuous equations which can be tackled with a nonsmooth Newton-type method based on the idea of using Newton-derivatives instead of the classical notion of semismoothness. Local fast convergence of the method is guaranteed under validity of an MPCC-tailored version of LICQ and a suitable strong second-order condition. In case of linear-quadratic MPCCs, the LICQ-type constraint qualification can be replaced by a weaker condition which depends on the underlying multipliers. We discuss a suitable globalization strategy for our method. Some comments regarding numerical results are presented in order to illustrate these theoretical findings.

This talk is based on joint work with Felix Harder and Gerd Wachsmuth (Cottbus, Germany).