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QPBLUR: An active-set convex QP solver based on regularized KKT systems

SNOPT obtains search directions from semidefinite QP subproblems, which are currently solved by SQOPT. For large problems with many degrees of freedom, the nullspace active-set method of SQOPT becomes inefficient.

QPBLUR is an alternative convex QP solver intended for use within SNOPT. It uses primal and dual regularization to ensure that the KKT system for any active set is nonsingular. A single-phase active-set method becomes possible. Warm starts can proceed from any given active set, and block-LU updates of the KKT factors as in QPBLU (Hanh Huynh's PhD dissertation, 2008) allow use of sparse-matrix packages such as LUSOL, MA57, PARDISO, SuperLU, or UMFPACK.

Joint work with Chris Maes, iCME, Stanford University.