A merit function approach for a facility location problem

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Abstract — We consider a well-known single facility location problem: one plans to build a new facility among existing facilities and wish to choose the location which minimizes the weighted cost associated with the Euclidean distance between the new and existing locations. In this talk, we study a new approach for this facility location problem. In particular, we reformu- late the facility location problem as a second-order cone program (SOCP). Then the KKT conditions of the SOCP yields a second-order cone comple- mentarity problem (SOCCP). Hence, the solution to the facility location problem can be obtained by solving the associated SOCCP. We adopt a so- called merit function approach, which means the SOCCP is equivalent to an unconstrained minimization, to solve the associated SOCCP of the facility location problem. Some numerical experiments are reported as well.