Evaluation of Quasi-Newton Strategy for Algorithmic Acceleration

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Abstract : An algorithmic acceleration strategy based on quasi-Newton (or secant) methods is displayed for address the practical problem of accelerating the convergence of the Newton-Lagrange method in the case of convergence to critical multipliers. Since the Newton-Lagrange iteration converges locally at a linear rate, it is natural to conjecture that quasi-Newton methods based on the so called secant equation and some minimal variation principle, could converge superlinearly, thus restoring the convergence properties of Newton's method. This strategy can also be applied to accelerate the convergence of algorithms applied to fixed-points problems. Computational experience is reported illustrating the efficiency of this strategy to solve fixed-point problems with linear convergence rate.