

REGULARIZED NEWTON METHOD FOR UNCONSTRAINED CONVEX OPTIMIZATION

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We introduce the regularized Newton method (rnm) for unconstrained convex optimization. For any convex function with a bounded optimal set, the rnm generates a sequence converging to the optimal set from any starting point. Moreover the rnm requires neither strong convexity nor smoothness properties on the entire space.

If the function is strongly convex and sufficiently smooth in the neighborhood of the solution then the rnm sequence converging to the unique solution with asymptotic quadratic rate.

We characterized the neighborhood of the solution where the quadratic rate occurs.