

Dear Prof. Kay Chen Tan,

I would like to submit the following manuscript to IEEE Transactions on Evolutionary Computation for possible evaluation.

Manuscript Title: Dynamic Online Gradient Descent with Improved Query Complexity: A Theoretical Revisit.

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The major contribution of this paper is as follows.

We provide a new theoretical analysis framework to investigate online gradient descent in the dynamic environment. Comparing with the previous work, the new framework recovers the state-of-the-art dynamic regret, but does not require extra gradient queries for every iteration. Specifically, when functions are α strongly convex and β smooth, to achieve the state-of-the-art dynamic regret, the previous work requires $O(\kappa)$ with $\kappa = \beta/\alpha$ queries of gradients at every iteration. But, our framework shows that the query complexity can be improved to be $O(1)$, which does not depend on κ . The improvement is significant for ill-conditioned problems because that their objective function usually has a large κ .