Labs
Optimization for Machine Learning
Spring 2018

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github.com/epfml/OptML_course

Problem Set 10, due May 25, 2018 (Accelerated Gradient Descent)

Restart

Prove the following theorem as given in the lecture slides:

Theorem 1. *By repeatedly restarting the AGD algorithm, we can find an ε-optimal solution in $\mathcal{O}(1/\sqrt{\varepsilon})$ updates.*

Convergence in Iterate

Prove the following theorem as given in the lecture slides:

Theorem 2. *By repeatedly starting the AGD algorithm, for a μ-strongly convex and L-smooth function, we can find an ε-optimal solution in the value of iterate in $\mathcal{O}(\log(1/\varepsilon))$ updates where the constant in the big-$\mathcal{O}$ is $\sqrt{\frac{L}{\mu}}$ compared to vanilla GD where the constant is $\frac{L}{\mu}$.*