Labs
Optimization for Machine Learning
Spring 2024

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github.com/epfml/OptML_course

Problem Set 7, April 26, 2024 (Newton)

Non-convex

Solve Exercises 40, 41, 42 from the lecture notes. These exercises are carried over from last week.

Newton's Method

Solve Exercises 48, 50 from the lecture notes.

Quasi-Newton Methods

Solve Exercise 53.

Fixed Point Iteration

The Jupyter notebook in `template/` contains the solution from Lab 03's exercise on fixed point iteration. Recall that we showed that the iterations to find a fix point of the g function can be seen as taking gradient step on a f function:

$$x_{t+1} = x_t - \gamma f'(x_t) = g(x_t)\,.$$

Please complete the notebook and adapt the algorithm to use Newton updates

$$x_{t+1} = x_t - \frac{f'(x_t)}{f''(x_t)}\,.$$