EP3260: Machine Learning Over Networks
Homework Assignment 3
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Problem 3.1

Consider the optimization problem on slide 11 of Lecture 6. Show that for convex and closed f: $\mathbf{Aw} - \mathbf{b} \in \partial g(\boldsymbol{\lambda})$ where ∂ is the set of subgradients.

Problem 3.2

Consider the dual ascent algorithm on slide 11 of Lecture 6. Analyze the convergence of dual ascent for L-smooth and μ-strongly convex f. Is the solution primal feasible?

Problem 3.3

Consider the optimization problem (P2) on slide 21 of Lecture 6. Extend the dual decomposition of Slide 6-12 to solve (P2). Compare it to the primal method (analytically or numerically) in terms of total communication cost and convergence rate on a random geometric communication graph.