THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

*** Revised ***

Optimization and Machine Learning Seminar

Quadratic error bound of the smoothed gap and the restarted averaged primal-dual hybrid gradient

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Abstract

We study the linear convergence of the primal-dual hybrid gradient method. After a review of current analyses, we show that they do not explain properly the behavior of the algorithm, even on the most simple problems.

We thus introduce the quadratic error bound of the smoothed gap, a new regularity assumption that holds for a wide class of optimization problems. Equipped with this tool, we manage to prove tighter convergence rates.

Then, we show that averaging and restarting the primal-dual hybrid gradient allows us to leverage better the regularity constant. Numerical experiments on linear and quadratic programs, ridge regression and image denoising illustrate the findings of the paper.

Date:	March 31, 2022 (Thursday)
Time:	5:00 - 6:00pm (Hong Kong Time)
Venue:	ZOOM: https://hku.zoom.us/j/
	Meeting ID: 997 3327 4432
	Password: 646089

All are welcome