THE UNIVERSITY   **OF HONG KONG**

Department of Mathematics

C O L L O Q U I U M

Some new optimization theory for convergence analysis of fast first-order algorithms

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Abstract

We present some new theoretical results for the topics of optimality conditions, constraint qualifications and error bounds in optimization, and show how these theoretical results can be used for analyzing the convergence of some very popular first-order algorithms which have been finding wide applications in data science domains. Some fundamental models such as the LASSO and grouped LASSO are studied, and it is shown that the linear convergence can be obtained if some algorithms are implemented for these models such as the proximal gradient method, the proximal alternating linearized minimization algorithm and the randomized block coordinate proximal gradient method. We provide a novel analytic framework based on variational analysis techniques (e.g., error bound, calmness, metric subregularity) for the convergence analysis of first-order algorithms. By this new analytic framework, we significantly improve some convergence rate results in the literature and obtain some new results.

Date:	**March 7, 2018 (Wednesday)**
Time:	**9:00 – 10:00am**
Venue:	**Room 210, Run Run Shaw Bldg., HKU**

All are welcome