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Line Search for Averaged Operator Iteration

Prof. Pontus Giselsson

Department of Automatic Control
Lund University

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About the speaker

Pontus Giselsson is an Assistant Professor at the Department of Automatic Control at Lund University, Sweden. His current research interests include mathematical optimization and its applications in, e.g., control and signal processing. He received an M.Sc. degree from Lund University in 2006 and a Ph.D. degree from Lund University in 2012. During 2013 and 2014, he was a postdoc at Stanford University. In 2012, he received the Young Author Price at an IFAC Symposium, in 2013 he was a finalist for the Best Student Paper Award at the American Control Conference, in 2014, he received the Young Author Price at the IFAC World Congress, and in 2015 he received the Ingvar Carlsson Award from the Swedish Foundation for Strategic Research.

Abstract

Many popular first order algorithms for convex optimization, such as forward-backward splitting, Douglas-Rachford splitting, and the alternat- ing direction method of multipliers (ADMM), can be formulated as av- eraged iteration of a nonexpansive mapping. In this paper we propose a line search for averaged iteration that preserves the theoretical con- vergence guarantee, while often accelerating practical convergence. We discuss several general cases in which the additional computational cost of the line search is modest compared to the savings obtained.

Contact

Prof. Giuseppe Notarstefano `giuseppe.notarstefano@unisalento.it`