

The Barycenter Method for Direct Optimization: an Overview, with Applications to Estimation of Switched Linear Models

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Abstract: We will present properties of the recently developed barycenter method for direct optimization that make it particularly useful in control applications. Equivalence of the method's batch and recursive formulations can be used to show that it has descent-like properties, although no derivatives are used, and that it is robust to noisy measurements and lack of differentiability. As a relevant application example, the method can be employed in the joint estimation of parameters and switching times for hybrid linear systems, an important problem that can pose significant computational challenges due to the non-convex nature of the combined optimization.

About the speaker: Felipe Pait studied electrical engineering at the University of S Paulo, and received a PhD from Yale University in 1993, advised by AS Morse. He has worked on adaptive control and applications. Currently he is interested applying randomized optimization algorithms to classical open questions of adaptive control design. He is associate professor at the University of S Paulo, Brazil, having dedicated substantial efforts to curriculum reform and multidisciplinary engineering education initiatives. During the Spring of 2019 he is teaching math foundations of data science at Northeastern University, Boston, Massachusetts.