

Optimization and Equilibrium Seminar.

Speaker: Professor Gabriel Haeser, Department of Applied Mathematics, University of São Paulo, Brazil

Title: Constant Rank Conditions for Second-Order Cone and Semidefinite Programming.

Abstract: In [R. Andreani, G. Haeser, L. M. Mito, H. Ramírez C., Weak notions of nondegeneracy in nonlinear semidefinite programming, arXiv:2012.14810, 2020] the classical notion of nondegeneracy (or transversality) and Robinson's constraint qualification have been revisited in the context of nonlinear semidefinite programming exploiting the structure of the problem, namely, its eigendecomposition. This allows formulating the conditions equivalently in terms of (positive) linear independence of significantly smaller sets of vectors. Here we extend these ideas to the context of nonlinear second-order cone programming. For instance, for an m -dimensional second-order cone, instead of stating nondegeneracy at the vertex as the linear independence of m derivative vectors, we do it in terms of several statements of linear independence of two derivative vectors. This allows embedding the structure of the second-order cone into the formulation of nondegeneracy and, by extension, Robinson's constraint qualification as well. This point of view is shown to be crucial in defining significantly weaker constraint qualifications such as the constant rank constraint qualification and the constant positive linear dependence condition. Also, these conditions are shown to be sufficient for guaranteeing global convergence of several algorithms, while still implying metric subregularity and without requiring boundedness of the set of Lagrange multipliers.

Date: 1st June, 2022 at 11:00 am (Chilean-time)

Venue: Online via Google Meet: <https://meet.google.com/whg-zqbt-ssy>

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<https://eventos.cmm.uchile.cl/optimseminar/seminars>