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Operations Research and Engineering Management
Seminar Series

Research Seminar

Convexification for Non-Convex Mixed-Integer Quadratic Programming

Dr. Sam Burer
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11:00 a.m. – 12:15 p.m.
https://smu.zoom.us/j/97906267193

Abstract
Convexification is an important technique used for solving non-convex mixed-integer quadratic programs. We discuss three recent convexification results for nonconvex quadratic programming over: (i) bounded (x_1,x_2,x_3) with $x_1*x_2 = x_3$; (ii) continuous (x_1,x_2) and binary (y_1,y_2) such that $(0,0) <= (x_1,x_2) <= (y_1,y_2)$; and (iii) a ball intersected with a second-order

cone. Although these structures may seem quite specialized, they appear as critical substructures in numerous applications. In addition to describing these three results, we survey the landscape---and the current research frontier---of convexification techniques in this area.

Biography
Sam Burer is the Tippie Rollins Professor in the Department of Business Analytics at the University of Iowa. He received his Ph.D. from the Georgia Institute of Technology, and his research focuses on convex optimization, especially semidefinite and copositive programming. He is the 2020 recipient of the INFORMS Computing Paper Prize, and his work has been supported by grants from the National Science Foundation, including the CAREER award. He currently serves as an area editor of *Operations Research* and as an associate editor for *SIAM Journal on Optimization* as well as Vice Chair of the SIAM Activity Group on Optimization.