INDUSTRIAL & SYSTEMS ENGINEERING SEMINAR

Wednesday, May 2
3:15 PM – Refreshments before the seminar
3:30 PM – Graduate Seminar
Mechanical Engineering Room 3125 (Room Change)

Simultaneous Column-and-Row Generation for Large-Scale Linear Programs with Column-Dependent-Rows

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In this study, we present a simultaneous column-and-row generation algorithm that could be applied to a general class of large-scale linear programming problems. These problems typically arise in the context of linear programming formulations with exponentially many variables. The defining property for these formulations is a set of linking constraints, which are either too many to be included in the formulation directly, or the full set of linking constraints can only be identified, if all variables are generated explicitly. Due to this dependence between columns and rows, we refer to this class of linear programs as problems with column-dependent-rows. To solve these problems, we need to be able to generate both columns and rows on-the-fly within an efficient solution approach. We first characterize the underlying assumptions for the proposed column-and-row generation algorithm. These assumptions are general enough and cover all problems with column- dependent-rows studied in the literature up until now to the best of our knowledge. We then introduce in detail a set of pricing subproblems, which are used within the proposed column-and-row generation algorithm. Finally, we conclude our presentation with a formal discussion on the optimality of the algorithm.

BIO: S. Ilker Birbil received his PhD degree from North Carolina State University, Raleigh, USA. He then worked for two years as a postdoctoral research fellow in Erasmus Research Institute of Management, Rotterdam, The Netherlands. His research interests include linear and nonlinear large-scale optimization with particular emphasis on algorithm development. Currently, he is working as a faculty member in Sabanci University, Istanbul, Turkey, where he teaches various courses on operations research.

FOR MORE INFORMATION ON PROFESSOR BIRBIL's RESEARCH, PLEASE VISIT: http://people.sabanciuniv.edu/sibirbil/index.html