

## On the standard pooling problem and strong valid inequalities

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### Abstract:

The focus of this talk will be on the standard pooling problem, i.e., a continuous, non-convex optimization problem arising in the chemical engineering context. First, we will introduce the problem that consists of finding the optimal composition of final products obtained by blending in pools different percentages of raw materials. Bilinear terms arise from the requirements on the quality of certain attributes of the final products. The quality is a linear combination of the attributes of the raw materials and intermediate products that compose the final product. Three different classical formulations have been proposed in the literature and their characteristics will be discussed and analysed. In the second part of the talk, strong relaxations for the pooling problem will be presented. In particular, we studied a structured non-convex subset of some special cases to derive valid nonlinear convex inequalities that we conjecture, and proved for a particular case, to define the convex hull of the non-convex subset. Preliminary computational results on instances from the literature are reported and demonstrate the utility of the inequalities when used in a global optimization solver. This is a joint work with Jeff Linderoth (University of Wisconsin-Madison), James Luedtke (University of Wisconsin-Madison), Jonas Schweiger (IBM).

### Bio:

Claudia D'Ambrosio is a research scientist (chargé de recherche) at CNRS affiliated at LIX, Ecole Polytechnique (France). She holds a Computer Science Engineering Master Degree and a PhD in Operations Research from University of Bologna (Italy). Her research speciality is mixed integer nonlinear programming. During her whole carrier, she was involved both in theoretical and applied research projects. She was awarder the EURO Doctoral Dissertation Award for her PhD thesis supervised by Professor Andrea Lodi and the 2nd award "Prix Robert Faure" (3 candidates are awarded every 3 years) granted by ROADEF society.  
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Huxley, 311

311, Huxley Bldg, Computing department, Imperial College London, London SW7 2AZ  
This event is free and open to the public. No registration is required.  
Reception drinks after the seminar in Huxley walkway level concourse .

