

## Scheduling multiproduct pipeline networks with time discretizations

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Pipelines, despite high installation costs, are considered highly efficient as a mode for transporting large amounts of oil and oil products over long distances, because they offer lower operation costs, higher reliability rates, lower product loss rates, less environmental impact, and less susceptibility to adverse weather conditions than other modes. This study deals with a multi-product pipeline system that transports a set of oil products (diesel, gasoline and kerosene, for example), which have to be moved from points (operating areas) where they are produced or stored (refineries, terminals) to points where they are needed (other refineries, distribution centers, terminals, ports, customers) through a pipeline or set of pipelines. The present study contributes primarily by offering an efficient tool for the problem of scheduling multi-product pipeline networks. The methodology proposed takes the approach of discretizing both pipelines and planning horizon and combines an efficient MILP model with a post-processing heuristic. When compared with previous models, we propose a more efficient one in which the set of volumetric constraints is modeled in the form of knapsack cascading constraints and constraints on products in pipeline sections, which significantly improved performance in the experiments that were conducted. Moreover, different objective functions were proposed to the suitability to various operational situations encountered in practice. In this context, the methodology developed constitutes an advance in terms of modeling the problem, making it feasible to solve problems increasingly close to the realities confronting oil industry operators.

### Biography

Erito Marques De Souza Filho, 32, has completed his Ph.D. in Operations Research in 2013 at Federal University of Rio de Janeiro in Brazil. He is also Master in Operations Research (2007) and in Populational Studies and Social Research by Nacional School of Statistics Sciences (2008). He is professor at Federal Rural University of Rio de Janeiro since 2008 and has paper published in Computers and Chemical Engineering and participation as lecturer in congress like Rio Pipeline, Rio Oil and Gas, Workshop, Location and Network Design (LAND), Latin-American Operations Research Congress and Interscience Conference on Antimicrobial Agents and Chemotherapy.

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