

Stochastic optimization for retrofitting chemical processes

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Most chemical plants operate in a dynamic environment. The variation of exogenous conditions affecting the plant, the exclusion of factors in analysis and the limits in the available information are added to significant uncertainties about the chemical processes. Uncertainties can be found at the input, output and process level.

The incorporation of uncertainties increases the complexity of the problem. It would be necessary to represent the decision maker's ideas as probability functions and the valuation of decisions by the expected value of their utility functions. A stochastic approach to retrofitting would include accompanying the retrofitting alternatives with a measurement of uncertainty in their performance.

In a rigorous treatment of uncertainties, the goal of the retrofitting methodology would be a new design that maximizes the expected value of the objective function. And industrial chemical process retrofitting problem has been applied to illustrate this approach.