Universidad Católica Nordestana
UCNE

Prediction-Based Multi-Objective Optimization for Oil Purchasing and Distribution with the NSGA-II Algorithm.

Autores: Yu, Lean
Yang, Zebin
Tang, Ling

Tipo de documento: Article

Materias: PETROLEUM industry -- Forecasting
PETROLEUM products -- Sales & prices
DEMAND (Economic theory)
FORECASTING
PREDICTION models

Resumen: Due to the uncertainty in oil markets, this paper proposes a novel approach for oil purchasing and distribution optimization by incorporating price and demand prediction, i.e., the prediction-based oil purchasing-and-distribution optimization model. In particular, the proposed method bridges the latest information technology and decision-making technique by introducing the recently proposed information technology (i.e., extreme learning machine (ELM)) into the oil purchasing-and-distribution optimization model. Two main steps are involved: market prediction and planning optimization in the proposed model. In market prediction, the ELM technique is employed to provide fast training time and accurate forecasting results for oil prices and demands. In planning optimization, two objectives of general profit maximization and inventory risk minimization are considered; and the most popular multi-objective evolutionary algorithm (MOEA), nondominated sorting genetic algorithm II (NSGA-II), is implemented to search approximate Pareto optimal solutions. For illustration and verification, the motor gasoline market in the US is focused on as the study sample, and the experimental results demonstrate the superiority of the proposed prediction-based optimization approach over its benchmark models (without market prediction and/or planning optimization), in terms of the highest profit and the lowest risk. [ABSTRACT FROM AUTHOR]

Número de **113638692**
acceso: